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**Cardiovascular Risk Factors in Adolescents:
An Exploratory Descriptive Study**

by

Karen L. Then 

A thesis submitted to the Faculty of Graduate Studies in
partial fulfilment of the requirements for the
degree of Doctor of Philosophy

Faculty of Nursing

Edmonton, Alberta
Spring 2000



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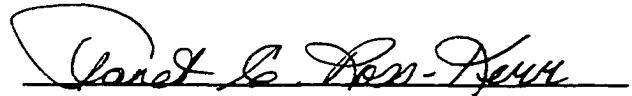
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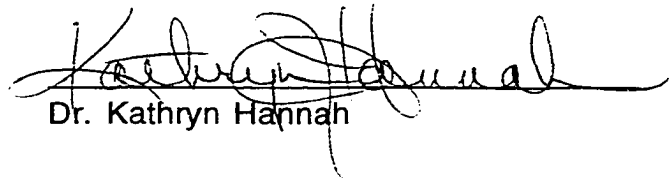
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*To my children, Krystal "Mousey" and Eric "Buddy".
You are my inspiration and joy!*

ABSTRACT

Cardiovascular disease (CVD) is the leading cause of death in Canada. Information is available regarding the understandings of risk factors in adults, but there is little information about the understanding of risks by adolescents. Two risk factors that lead CVD often found in the adolescent population are: smoking and physical inactivity. What is also unknown is the possible impact of stress/anxiety in adolescents on other behaviors such as smoking and physical activity.

The purpose of this exploratory study was to gain more information regarding smoking and physical inactivity in adolescents, and the influence that stress/anxiety might have on these risks. Study methods included the administration of a risk factor questionnaire and the participation of adolescents in focus group sessions.

A total of 57 adolescents completed the questionnaire and a subsample of these adolescents participated in focus groups. The findings of this study were categorized into the areas of knowledge, influencing factors, and effects of stress/anxiety on the cardiovascular (CV) risk factors of smoking and physical inactivity. Approximately 35% of males and 58% of females had tried smoking by Grade 9. The majority of adolescents reported being very active (64.9%), while 29.8% were moderately active, and 5.3% were inactive. Factors identified that influenced both smoking and physical activity/inactivity

levels included: peers, media, family and general social pressure.

Focus group data were organized in relation to influences on behavior which included cognitive abilities and developmental roles and responsibilities. Developmental roles and responsibilities included: identity (self) and relationships (intimate, peer, authority and society/cultural). Sub-categories developed from the focus group data included: need for acceptance, body image, peer pressure, rebellion, stressors, vulnerability and media influence. Gender differences were identified in relation to the themes of image and peer pressure.

This dissertation addresses the questionnaire and focus group results in relation to gender differences, risk factor participation, and presents conclusions and recommendations for practice. Understanding these risk-taking behaviors and the influence of stress/anxiety from the adolescent's perspective will help nurses in developing CV programs specifically aimed at this population.

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LIST OF ABBREVIATIONS

ANA	Autonomic Nervous System
CNS	Central Nervous System
CV	Cardiovascular
CVD	Cardiovascular Disease
CVRF	Cardiovascular Risk Factors
ETS	Environmental Tobacco Smoke
GABA	Gamma-aminobutyric Acid
HD	Heart Disease
HX	History
SES	Socioeconomic Status
TV	Television

CHAPTER 1

STATEMENT OF THE PROBLEM AND SIGNIFICANCE

Introduction

Cardiovascular disease (CVD) is the leading cause of death in Canada and worldwide (Heart and Stroke Foundation of Canada, 1996, 1997). In 1995, 79,117 deaths in Canada were attributed to CVD (Heart and Stroke Foundation of Canada, 1997). The CVD process is related to a number of risk factors which include the following: smoking, elevated blood cholesterol, high blood pressure, physical inactivity, diabetes mellitus, obesity, thrombogenic, inflammatory and immunologic responses, dietary iron, and psychosocial factors, including anger (Heart and Stroke Foundation of Canada, 1997; Howard et al., 1991; Nicklas, Webber, Johnson, Srinivasan, & Berenson, 1995). The higher the prevalence of cardiovascular risk factors (CVRF), the higher the mortality and morbidity (Heart and Stroke Foundation of Canada, 1996, 1997). According to the Heart and Stroke Foundation of Canada "The hallmark of cardiovascular disease is the synergistic effect of more than one risk factor on overall cardiovascular disease risk" (1997, p. 46). Cardiovascular disease risk increases even with moderate elevations in more than one risk factor (Wilhelmsen, 1990).

Although CVD does not usually become symptomatic until adulthood, CVRF predictive of CVD can be identified in adolescents. The prevalence of CVRF in adolescents is high, with 50% of males and 53.5% of females 12-15 years of age having one or more cardiovascular risk factor (Rabbia et al., 1994). Twelve per cent of both male and female adolescents 12-15 years of age overall have two or three risk factors (Rabbia et al.). The risk factors that have been identified in adolescents are smoking, physical inactivity, high blood

pressure, obesity and/or hypercholesterolemia, (Berenson et al., 1998; Lipp, Deane, & Trimble, 1996) and stress (Rabbia et al.). In the present study only smoking and physical activity/inactivity were addressed. Both of these CVRF are correlated with the development of CVD in the adult population and are risks that often prevail for many years (Berenson et al.; Lipp, Deane, & Trimble; Gaziano, 1998). These two risk factors are usually observed in the adolescent population for a number of years prior to adulthood. In the context of this thesis the term *CVRF* will refer exclusively to smoking and physical inactivity in adolescents.

Early identification and appropriate CVRF reduction strategies have been clearly shown to impact the CVD process in adults (Heart and Stroke Foundation of Canada, 1996, 1997); therefore the assumption is that CVRF reduction strategies will similarly impact CVD in adolescents. It is reasonable to suggest that CVRF reduction strategies can only be effective and sustainable if they incorporate an understanding of the CVRF themselves, reasons for the behaviors, and the context in which the behaviors occur.

In the adult population, much is known about CVRF modification. The assumption has been that this knowledge can be extrapolated to the adolescent population. However, a review of the literature revealed large knowledge gaps in our understanding of CVRF and CVRF reduction in the adolescent population. Strategies have been developed to promote cardiac health and reduce CVRF in adolescents (Butcher et al., 1988; Pike & Banoub-Baddour, 1991, Worden, Flynn, Solomon, Secker-Walker, Badger, & Carpenter, 1996). The problem with the present CVRF reduction programs for adolescents is that they have been developed primarily from an adult perspective instead of being developed from the perspective of the adolescents themselves.

It is often assumed by health care clinicians that adolescents participate in high cardiovascular risk behavior (e.g., smoking) because they lack knowledge or that they have affiliative needs that must be met (e.g., peer pressure) (Berenson, Srinivasan, Nicklas, & Johnson, 1986; Personal communication, Junior High Vice, Principal, 1998). This is speculative because there is limited empirical evidence related to what drives adolescent behavior and adolescents' level of knowledge regarding cardiovascular (CV) health. Views of adolescent behavior fall into several theoretical schools of thought: biological, psychoanalytical, psychosocial, developmental, humanistic interactionist, cognitive, and multidimensional (Botz, & Bidwell-Cerone, 1997; Bradley-Corpuel, 1996; Redston-Iselin, 1995). Each theory provides slightly different views on adolescent behavior, transition and development to adulthood. If there were clearer understanding of adolescent knowledge, perceptions and beliefs, as well as rationale for participation in high risk behavior regarding CVRF then specific interventions/strategies could be developed.

Adolescent behaviors and knowledge regarding CVRF should be understood in relation to the context in which the adolescents are learning these behaviors; including the physical environment, social structure, peer pressure and education system. Knowledge regarding CVRF may also be related to whether their past or current family members experienced cardiac disease.

Adolescents must deal with many biological and psychological changes. These changes often occur rapidly and can be associated with varying levels of anxiety. The impact of anxiety on adolescents' behavior in relation to CVRF is poorly understood. In the adult literature, findings suggest that anxiety may have effects on some behavior patterns, and overall cardiovascular risk

(Hayward, Clark, & Taylor, 1990; Howard et al., 1991). The relationship of anxiety as an influencing factor on smoking and physical inactivity in adolescents is largely unexplored.

In summary, a review of the literature revealed that there are gaps in knowledge regarding adolescent CVRF of smoking and physical inactivity. There is also inadequate information regarding the relationship that anxiety might have on these CVRF in adolescents. Clearly, understanding CVRF and influences on these factors from the adolescent perspective will provide valuable information for the development of health promotion strategies aimed at changing habits when they are forming, rather than after they have already been established (Harrell & Frauman, 1994).

Purpose of the Study

The purpose of this exploratory, descriptive study was to add to the existing knowledge base regarding the CVRF of smoking and physical inactivity in the adolescent population.

Objectives of the Study

The major research objectives of this study were to:

1. Assess adolescents' knowledge regarding the CVRF of smoking and physical inactivity.
2. Identify the factors that adolescents think influence the CVRF of smoking and physical inactivity in themselves and other adolescents.
3. Explore what adolescents think regarding the effect of anxiety on the CVRF of smoking and physical inactivity in themselves and other adolescents.

Research Questions

In relation to the objectives of the study, specific questions were addressed and include:

1. What is the frequency of the CVRF of smoking, and physical inactivity in a sample of adolescents?
2. What knowledge do adolescents have regarding the CVRF of smoking and physical inactivity?
3. What individuals and factors do adolescents think influence the CVRF of smoking and physical inactivity in themselves and other adolescents?
4. What are the views of adolescents regarding the influence of anxiety on CVRF of smoking and physical inactivity in themselves and other adolescents?

Summary

In summary, when the literature is reviewed in relation to the adolescent population and risk factors for CVD, there are more questions than answers. In trying to understand why adolescents smoke, are physically inactive, are anxious, or have any of the other risk factors, one must ask some very basic questions regarding their knowledge, perception of risk, and rationale for participation in high risk behaviors. Understanding these factors and perceptions about risk factors is key to influencing subsequent health behavior and program development for risk reduction (Pederson, O'Neill, & Rodman, 1994).

Cardiovascular risk factors of smoking and physical inactivity are areas that need to be examined in more depth in relation to the adolescent population. Understanding anxiety as it relates to these two risk factors is

important if nurses are to be able to promote and help maintain healthy living throughout the adolescent years and into adulthood.

Therefore, the aim of this exploratory descriptive study was to begin to examine adolescents' perspectives on the risk factors of smoking and physical inactivity and the role that anxiety might play on these factors in this population. This information has not been available to date and was seen as an important step from which health promotion strategies can begin to be developed.

CHAPTER 2

LITERATURE REVIEW

The literature review focuses on the cardiovascular risk factors (CVRF) of smoking and physical inactivity. In addition adolescent stressors and anxiety are explored in relation to the influence they might have on these CVRF. The primary focus is on the literature related to the adolescent population.

Smoking

As evidenced by a thorough review of the literature there has been extensive research conducted with respect to smoking as a risk factor for CVD. The section of the review dealing with smoking is divided into the following subsections: smoking as a cardiovascular risk factor, adolescent smoking prevalence rates, gender and adolescent smoking prevalence rates, categorization of smoking behavior and adolescent smoking prevalence rates, and factors that influence smoking.

Smoking as a Cardiovascular Risk Factor

Smoking is the primary risk factor associated with CVD (Heart and Stroke Foundation of Canada, 1996, 1997). Nicotine in cigarettes stimulates catecholamine (both epinephrine and norepinephrine) release, causing peripheral vascular constriction and an increase in heart rate (McCance & Huether, 1994). Consequently, blood pressure, cardiac workload and oxygen consumption increase over time and lead to damage of the intimal layer and endothelial wall lining of the coronary vessels. The vessel damage results in platelet adhesion, clot formation, hemorrhage and the formation of atherosclerotic plaque (McCance & Huether, 1998).

Carbon monoxide from cigarette smoke binds to hemoglobin molecules and displaces oxygen, thereby causing hypoxia. The cadmium in cigarette smoke is believed to be related to elevations in blood pressure. Numerous carcinogenic agents are present in both mainstream and environmental tobacco smoke (ETS, also referred to as second-hand smoke) (Heart and Stroke Foundation of Canada, 1997; McCance & Huether, 1998). Although smoking has clearly been shown to affect the cardiovascular (CV) system, the results of *secondary smoke* or ETS have also been reported to seriously affect the CV system (Heart and Stroke Foundation of Canada & Canadian Council on Smoking and Health, 1995). The effects of ETS have primarily been studied in adults. The effect of ETS on adolescents and children and its possible relationship to CVD needs further investigation (Adeyanju & Creswell, 1987; Howard et al., 1991).

Smoking in adolescence is also linked to higher serum cholesterol levels. When individuals have been tracked over time it has been shown that elevated cholesterol levels, inactivity and smoking persist from childhood to adulthood, placing these individuals at a higher risk for the development of CVD (Raitakari et al., 1994). Smoking itself is a cardiovascular risk factor but it is often viewed as a “marker” for other high-risk behaviors such as: inactivity, sedentary lifestyle, poor diet, early sexual activity, alcohol use, and use of illegal drugs (Clayton, 1991; Health Canada, 1996).

Adolescent Smoking Prevalence Rates

Among numerous surveys conducted in Canada there are three that provide specific information regarding prevalence of risk-taking behaviors (including smoking) in youth: (1) The Health of Canada’s Youth Survey (Health and Welfare Canada, 1992), (2) 1994 Youth Smoking Survey (Health Canada,

1996), and (3) Smoking Survey (Statistics Canada, 1981). In each of the surveys youth have been randomly selected to participate from across Canada. The surveys used in the studies done in Canada in general relate to smoking prevalence and related smoking behavior issues such as: age of onset, frequency, smoking amounts, parental and family smoking, and peer smoking habits).

The Health of Canada's Youth survey consisted of 4500 youth (1500 age 11, 1500 age 13 and 1500 age 15) who were randomly chosen based on age, gender and geographic distribution (Health and Welfare Canada, 1992). These youth were given a questionnaire to gather information regarding risk-taking behaviors and to gain insight into young people's health-related attitudes, and knowledge. The results of this survey showed that by age 15, 55% of adolescents had tried smoking and over 20% of these adolescents have continued to smoke regularly (Health and Welfare Canada, 1992).

The 1994 Youth Smoking Survey consisted of approximately 23,700 interviews (14,200 self-administered questionnaires for age 10-14 and 9,500 telephone interviews for youth aged 15-19) (Health Canada, 1996). This survey was done across Canada and looked at prevalence and factors related to smoking (e.g., reasons to start, who youth smoked with). The researchers found that nationally 24% of 15-19 year olds smoke and 7% of youth aged 10-14 smoke. Males age 10-14 smoke on average 10 cigarettes per day, and females smoke 9.3 cigarettes per day. Another important finding was that 46% of young persons aged 10-19 had at least one parent who currently smoked.

In comparing the Health and Welfare Canada survey (1992) and the Health Canada survey (1996) the results were very similar in relation to prevalence of smoking and relationships of family members who also smoke.

One major difference is that the Health of Canada's Youth survey (Health and Welfare Canada, 1992) was not specific to youth smoking but was more general regarding a variety of health-related attitudes, behaviors and knowledge. Similarities between the two studies included prevalence rates, amounts smoked, and parent smoking rates. The 1994 Youth Smoking Survey was much more comprehensive in regard to profiles of smokers and their attempts to quit, attitudes and beliefs, social influences and restrictions, the ability of youth to purchase cigarettes and the marketing of tobacco products.

The prevalence of smoking in Canada in the 15-19 age group has fallen from 43% in 1981 (Statistics Canada, 1981) to 24% in 1994; there has been no appreciable change in prevalence since 1991 when 23% of this age group smoked (Health Canada, 1996). Health Canada (1996) from their Youth Smoking Survey, 1994 also reported that, in Alberta, 6% of 10-14 year olds and 24% of 15-19 year olds smoke. The earlier in life individuals start smoking the more likely it is that they will continue to smoke, and the more they will smoke (Health Canada, 1996).

American researchers in the 1980's and 1990's have reported that between 22-32% of adolescents smoke consistently (Harrell & Frauman, 1994; Pebler, Hester & Connor, 1987; Pike & Banoub-Baddour, 1991; Raitakari et al., 1994; Wolfgang & Dennison, 1982). They also reported that the average age group in which smoking is initially attempted and maintained consistently is 14-17 years.

In summary, there has been a substantial decrease (from 43% in 1981 to over 20% in 1994) in the prevalence rate of smoking in adolescents overall. Despite the notable decrease in smoking in both Canada and the United States prevalence stubbornly remains above 20%. More recent literature regarding an increase in smoking rates in adolescents in Alberta is reported in the next

subsection.

Gender And Adolescent Smoking Prevalence Rates

The smoking rates in adolescents overall do not seem to have changed appreciably over the last few years. However, recently a difference has been detected in the gender specific smoking rates.

Until 1994 there did not appear to be any statistically significant difference in numbers of adolescent females and males who smoke. Although gender was not reported to be statistically different in other studies (Health and Welfare Canada, 1994; Health Canada, 1996), Raitakari et al. (1994) in a longitudinal cross-sectional survey of 4,320 children and adolescents found that sedentary adolescents started to smoke and continued to smoke more often than their active counterparts, (9.3% of active males smoked compared with 46.9% of inactive males, $p = <0.001$; 8.7% of active females smoked compared with 45.5% of inactive females, $p = 0.002$).

More recently, the 1996 General Social Survey reported that young Alberta females were among the heaviest smokers in Canada (Statistics Canada, 1997). This telephone survey included 12,756 randomly chosen Canadian youth aged 15 years and over from across the provinces, with 1,252 respondents from Alberta. The smoking rate among young females in Alberta was the highest of any province in 1996, with the next highest province being British Columbia where 33% of young females are current smokers (Statistics Canada, 1997). The Alberta data reveal that almost one half (48%) of females between the ages of 15-24 were regular smokers in 1996 as compared to 31% of young females surveyed across Canada. At the same time only 28% of Albertan males in the same age group were regular smokers. Female smokers in Alberta aged 15-24 included 35% daily smokers and 13%

occasional smokers. Table 1 is a display of the National Survey results from The Health of Canada's Youth (Health and Welfare Canada, 1992), The 1994 Youth Smoking Survey (Health Canada, 1996), and the General Social Survey (Statistics Canada, 1997) in relation to smoking by age and gender.

Table 1 Smoking by Age and Gender

	The Health of Canada's Youth 1992* %	1994 Youth Smoking Survey ** %	1996 General Social Survey *** (Alberta only) %
Smokers age 10-14, males	Age 11 - 7% Age 13 - 14%	7%	Not Available
Smokers age 10-14, females	Age 11 - 5 Age 13 - 14%	7%	Not Available
Smokers age 15-19, males	Age 15 - 22%	23%	28%
Smokers age 15-19, females	Age 15 - 26%	24%	48%

* The Health of Canada's Youth (Health and Welfare Canada, 1992)

** The 1994 Youth Smoking Survey (Health Canada, 1996)

*** The General Social Survey (Statistics Canada, 1997)

Although the smoking rates reported in the General Social Survey in 1996 showed that a high percentage of Alberta female youth smoked, it is important to note that the sample size was only 1,252. The smaller sample size in comparison to previous Health Canada surveys may be responsible for the high rates of female smokers despite randomized sampling techniques being used. What is unclear is a description of the representativeness of the sample to the female adolescent population in Alberta. The results need to therefore be viewed with caution and further research involving larger samples needs to be done.

There has been speculation about why smoking rates in young females is so high. The authors of the Alberta Tobacco Control Centre report suggest that recent government changes and current social conditions such as high youth unemployment, and low income among women may be factors contributing to high smoking rates (Alberta Tobacco Control Centre, 1997). Clearly more research is needed to provide some of the answers with respect to smoking behaviors in this population.

Categorization of Smoking Behavior and Adolescent Smoking

Prevalence Rates

Researchers have recently attempted to categorize smoking behavior into different stages: trying/initiation (first cigarette ever), experimentation (smoking occurs less than once a week), regular smoking (smoking occurs more than once a week), and nicotine dependence (physical and psychological craving for cigarettes) (Winkelstein, 1992). Once a person has started smoking and progresses through the stages to nicotine dependence it is much harder for the individual to quit. The 1997 Youth Risk Behavior Survey done in the United States found that 70.2% of high school students had tried cigarette smoking and of those, 35.8% became regular smokers who smoked daily (Morbidity and Mortality Weekly Report, 1998).

Most researchers have examined smoking in adolescents' junior and senior high school years. Harrell and Frauman (1994) reported statistics from the cardiovascular health in children (CHIC) study done in 1990, in North Carolina (n = 2209 randomly selected children from grades 3 and 4). They found that as many as four percent of third and fourth grade children had already tried smoking. Abernathy and Bertrand (1992) in their structured self-report Health Behaviour Questionnaire of 8672 students in Calgary, Alberta

(4390 males and 422 females) reported smoking rates in Calgary and found that between 25% - 35.3% of students (both males and females) in grades 6-8 had tried smoking cigarettes or smokeless tobacco (i.e., chewing tobacco). The figures in Table 2 provide percentages, identified by Abernathy and Bertrand (1992), of males and females in grades 6 - 8 who have never smoked, experimented, and are current smokers. The original research by Abernathy and Bertrand (1992) also included smokeless tobacco use. It is emphasized that the figures in Table 2 represent cigarette smoking only and do not include smokeless tobacco use.

Table 2 Prevalence of Cigarette Use in Calgary*

All students in Grades 6-8. N=8672 (4390 males, 4222 females)

	Never %	Experimenter %	Current User %
Grade 6 (Males)	69.5	26.1	4.4
Grade 7 (Males)	58.5	32.8	8.7
Grade 8 (Males)	53.5	35.3	11.2
Grade 6 (Females)	71.5	24	4.5
Grade 7 (Females)	58	29.7	12.2
Grade 8 (Females)	46.8	31.4	21.9

Adapted from "The Prevalence of Smokeless Tobacco and Cigarette Use Among Sixth, Seventh and Eighth Grade Students: A Longitudinal Investigation," by T.J. Abernathy, & L.D. Bertrand, 1992, *Canadian Journal of Public Health*, 83(1), p. 16-17.

*Note: These figures represent cigarette smoking only and do not include smokeless tobacco use.

As shown in Table 2, in Grade 8 11.2% of the males and 21.9% of the females are current smokers. In Canada, 7% of males and females aged 10-14 are current smokers, while 23% of males and 24% of females between 15-19 years are current smokers (Health Canada, 1996). Smoking is not usually

consistently initiated before age 14, however the age of onset of smoking may be influenced by different factors and beliefs and these areas need to be examined more closely in different age groups. The recruitment of the vast majority of new smokers occurs during the adolescent years (Worden et al., 1996). Sixty percent of smokers begin smoking by the age 13, and 90% begin by age 20 (Tye, Warner, & Glantz, 1987).

Physical Activity/Inactivity

The term *physical activity* refers to the regular participation in either structured or unstructured activity at least 3 to 5 times per week for at least 30 minutes (Heart & Stroke Foundation, 1993; Health and Welfare Canada, 1992). The terms *physical activity* and *exercise* are used interchangeably. In the context of the present study *physical inactivity* was conceptually defined as the lack of participation in regular physical activities at least once per week. *Excessive physical activity* refers to strenuous activity that an individual engages in for extended periods every day during the week which results in deleterious physical and psychological effects.

Physical Activity

Individuals who exercise routinely generally enjoy improved physical and mental health (Health and Welfare Canada, 1992; Dunn & Blair, 1997). Researchers have shown that regular exercise helps improve physical fitness, blood pressure, lipid levels, and body composition in children, adolescents, and adults (Jennings et al., 1986; Lipp, Deane, & Trimble, 1996; Wood, Stefanick, Williams, & Haskell, 1991). Regular exercise improves cardiovascular efficiency and helps modify CV risk profiles in both healthy individuals, and individuals at

risk for CVD (Kirschenbaum, 1997).

Exercise is necessary in maintaining adequate blood flow throughout the body, reducing platelet adhesion in the cardiovascular system, and maintaining and improving heart function (McCance & Huether, 1998). It has also been suggested that exercise can affect mood and anxiety states (Raglin, 1997; Yeung, 1996) and can enhance and help maintain general overall emotional health (Hughes, 1984; Rice, 1987). The research on physical activity and anxiety has generally shown that a variety of physical activities are associated with psychological and physical benefits (Raglin, 1997). It is unclear precisely how exercise influences psychological states. One theory is that the mood enhancing effects of exercise are due to endorphin release in the central nervous system (Yeung, 1996). Research in this area is limited and controversial due to problems of confounding variables and lack of carefully controlled conditions.

Physical activity can lead to a positive body-image (Eide, 1982; International Society of Sport Psychology [ISSP], 1992; Leventhal, 1979). Benefits of physical activity can include such things as: positive changes in self perception, well being, self-confidence, relief of tension, relief of anxiety, increased alertness, clear thinking, and increased social contact (International Society of Sport Psychology, 1992). With regard to physical activity, Steptoe, Wardle, Pollard, Canaan, and Davies (1996) found that the overall amount of vigorous physical activity decreased during "exam stressed" times (1996). Overall perceived stress and emotional distress were higher in women than men which supports the notion that gender differences are present and may be related to stress responsiveness. Stress responsiveness and gender differences in relation to physical activity need to be investigated further.

Steptoe et al. (1996) studied 180 university students' smoking habits, and physical exercise levels during stressful periods. They found that females,

especially those with low social support, smoked more than 50% more cigarettes during stressful times. No significant difference in smoking habits was noted in males.

Exercise which promotes CV fitness tends to promote an increase in high density lipoproteins (HDLs) which are associated with a reduction in CVD risk (Heart and Stroke Foundation of Canada, 1996, McCance & Huether, 1996). Cardiovascular fitness is directly related to the physical intensity, duration and regularity of the exercise program (Jenkins, 1988). The effects of regular exercise at specific intensities and durations has been investigated with adults, but less is known about exercise programs and their effect on CV fitness among adolescents. Rutenfranz, (1989) in his cross-sectional and longitudinal study of 1652 German children and adolescents, found that 50% of adolescents were inactive. Rutenfranz (1989) found that in his sample of students (n = 1413), 25% of males and 20% of females spent more than 4 hours per day watching television and ten of the respondents watched 8 hours or more per day of television.

Rabbia et al. (1994) studied 1413 randomly selected junior high school students. The study included a clinical examination from a medical team and the completion of a questionnaire. Rabbia et al. (1994) found that 28.3% of males and 40.1% of females declared levels of physical activity that were equal to or less than the time spent in weekly school gym classes.

In contrast, Pebler, Hester and Connor (1987) reported that the majority of adolescents in their study exercised routinely. Pebler et al. (1987) studied a random sample of 100 grade ten students in a large suburban high school in Denver. They obtained the data from a self administered questionnaire and from physical examination by two registered nurses. Differences in findings between this study and the study by Rabbia et al. (1994)

may be explained by the district chosen, geographic location, the ethnic distribution of students, and their socioeconomic class. Rabbia et al. (1994) had 1413 randomly selected students from a number of junior high schools in Italy, while Pebler, Hester and Connor (1987) had only 100 randomly selected adolescents who were almost exclusively Caucasian and came from the middle to upper-middle socioeconomic class in a suburban high-school centre.

In the Health of Canadians' Youth Survey (Health and Welfare Canada, 1992) researchers found that more males as compared to females exercised at least four times a week out of school and more females than males exercised once a week or less. Table 3 provides a summary of the Health of Canadians' Youth Survey findings in relation to both males and females and exercise frequency. Females generally were shown to participate less in physical activities, and considered themselves to be less fit than males. Canadian girls in all three age groups (mean ages 11, 13, and 15) spent slightly less time watching television or watching videos than Canadian boys, and both sexes (mean age 15) reported watching less television than 11 and 13 year olds (Health and Welfare Canada, 1992). Although Canadian teens are participating in physical exercise, one of the major concerns with respect to CVD risk is the decrease in physical activity with age, especially in the female population. This large difference between males and females and their activity patterns between the ages of 11 and 15 is clearly indicated on Table 2.3. As can be seen only 8 percent fewer males exercised at least 4 times per week out of school (age 11 = 70%, age 15 = 62%), whereas 21% fewer females exercised 4 times per week out of school (age 11 = 52%, age 15 = 31%).

Table 3 Health of Canadian Youth: Exercise Frequency

	Males age 11	Males age 13	Males age 15	Females age 11	Females age 13	Females age 15
Exercised at least 4 X per week out of school	70%	71%	62%	52%	40%	31%
Exercised once a week or less	14%	13%	17%	22%	30%	41%

Extracted from Figure 3.1 and 3.2 "The health of Canada's youth," by Health and Welfare Canada, 1992, Minister of National Health and Welfare. ISBN 0-662-19373-3.

The Youth Risk Behavior Surveillance System (YRBSS) monitors health risk behaviors among youth and young adults in six categories: behaviors that contribute to unintentional and intentional injuries; tobacco use; alcohol and other drug use; sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases; unhealthy dietary behaviors; and physical inactivity. The 1997 national school-based survey used a three-stage cluster sample design that involved the distribution and collection of data from 16,262 questionnaires that were completed in 151 schools. In the 1997 Youth Risk Behaviour Surveillance which was done in the United States, 63.8% of students throughout the United States had participated in activities that made them sweat and breathe hard for at least 20 minutes on three or more days out of a seven day period (this was equated to moderate and vigorous activity) (Kann et al., 1998).

Similarly to the results of The Health of Canadian's Youth survey, the YRBSS males (72.3%) were more likely than female students (53.5%) to participate in vigorous activity (Kann et al., 1998). Caucasian students (66.8%) were more likely to participant in vigorous activity than Hispanic

(60.4%) or African American students (53.9%). A trend of decreasing physical activity was also noted with increasing age groups, Grade 9 students were more physically active than Grade 11 or 12 students, and students in Grade 10 were more likely to participate in physical activities than Grade 12 students. Males in the study were also more likely than females to be involved in team sports (males = 55.5%, females = 42.3%).

Physical Inactivity

Physical inactivity has been identified as a risk factor for the development of CVD. Physical inactivity has been significantly correlated in both males and females with high levels of low-density lipoprotein cholesterol, (i.e. the “bad” cholesterol) and an increase in percentage of body fat (Kemper, Snel, Verschuur, & Storm-Van Essen, 1990; Pebler, Hester & Connor, 1987; Rabbia et al., 1994; Raitakari et al., 1994; Wolfgang & Dennison, 1982).

Excessive Physical Activity

While there are benefits to physical activity (as outlined above), some research has indicated that physical activity may have detrimental effects. Excessive physical or psychological training can lead to significant mood disturbances (O'Connor, 1997). Overtraining can lead to negative mood states such as fatigue, depression, anger, confusion, and tension. An increased training load is also detrimental to physiological functioning and can contribute to an increased number and severity of athletic injuries (O'Connor, 1997). Physiologically overtraining causes individuals to have elevated cortisol (O'Connor, Morgan, Raglin, Barksdale, & Kalin, 1989), reduced testosterone, and changes in norepinephrine and other hormonal responses (Hooper, Traeger Mackinnon, Gordon, & Bachman, 1993). Serious cardiovascular arrhythmias

caused by electrolyte imbalance and extensive increases in myocardial ventricular strain can also occur (Hooper, Traeger Mackinnon, Gordon, & Bachman, 1993).

In summary, research results vary in regard to amount of physical activity and inactivity by adolescents. More research is indicated with Canadian youth. Factors influencing physical activity/inactivity levels are also not well documented, and further research is needed in this area.

Factors that Influence Risk-Taking Behaviors:

Smoking and Physical Activity/Inactivity

Adolescence is a time of significant physical, social, and emotional change or transition. In order to understand risk-taking behaviors one has to understand what influences adolescents to participate or not participate in those behaviors. Factors that can influence risk-taking behaviors include knowledge and beliefs, family and peers, and stress/anxiety. These factors will be addressed as they effect the risk-taking behaviors of smoking and physical activity/inactivity. One of the factors, stress/anxiety, in particular is reviewed as it related to the research question regarding the influence of stress/anxiety on the CVRF of smoking and physical activity/inactivity. Other influencing factors are discussed in Chapter 6 as they emerged from the qualitative data.

Factors that influence smoking in particular in the adolescent population are not well documented and understood. Winkelstein (1992) in her review of the literature identified certain biological (e.g. physiological stages of addiction), social (e.g. influence of parents and peers) and psychological (e.g., intention to smoke, issues of self-esteem, inadequate coping skills) factors that influence smoking in adolescents. Some factors that influence smoking include socioeconomic status, peer pressure, and curiosity (Health Canada, 1996).

Factors that influence physical activity in the adolescent population vary and also are not well documented and understood. Some factors that may influence physical activity in adolescents include: stress; and other risk taking behaviors (e.g., smoking) (Health and Welfare Canada, 1992). Other factors that may influence physical activity/inactivity in adolescents that have been suggested in the literature include: encouragement from others (e.g., father, mother, best friends); participation by others close to them; stressors (e.g., peer, family); and attitude toward physical education classes (Health and Welfare Canada, 1992). The association between factors such as smoking and anxiety is not clear with respect to a cause and effect relationship.

Knowledge and Beliefs

Cognitive development proceeds through a series of four stages (Piaget, 1969). The stages include: sensorimotor (birth to 2 years); preoperational (2 to 7 years); concrete operations (7 to 11 years); and formal operations (11 to 15 years). The formal operational stage includes: combinational logic, separating the real from the possible, using abstractions, hypothetical-deductive reasoning, and thinking about thinking (Haviland & Scarborough, 1981; Kaplan, 1986; Wong, 1993). It is important to note that although adolescents fall into the formal operations level, not all adolescents or even adults show reasoning at this stage (Kaplan, 1986). The process of cognitive development occurs over a number of years with younger adolescents only beginning to think and reason at the formal operational stage.

In the Canadian Youth Smoking Survey, in 1994 ($n = 14,270$) some beliefs regarding health effects of smoking and perceived benefits of smoking were investigated (Health Canada, 1996). The researchers found that non-smokers were more likely to think that there is danger to health from

cigarettes than their peers who smoke (65% of non-smokers versus 53% of smokers). Significant differences regarding perceived *benefits* of smoking were identified between non-smokers and smokers. Nearly three quarters of all smokers age 10-19 (71%) compared to 31% of non-smokers believed that smoking helps people relax (Health Canada, 1996). Thirty-seven percent of smokers versus 10% of non-smokers in the same age group feel that smoking can help with boredom. The effects of smoking on relaxation and stress/anxiety levels are further discussed under the stress/anxiety section.

Family and Peer Influence

One factor that has been shown to influence adolescents is the prevalence of parents and peers who are also smokers (Bewley, Bland, & Harris, 1974; Biglan, McConnell, Severson, Bavry, & Ary, 1984; Health Canada, 1996; Winkelstein, 1992). Harrell and Frauman (1994) found that 57.2% of adolescents who smoked had at least one parent who smoked. Pebler, Hester, and Connor (1987) found 39%, while Health Canada (1994) found that 46% of adolescents up to the age of 19 had at least one parent who currently smoked, and 21% had two or more regular smokers at home.

Pebler, Hester, and Connor (1987) conducted a cross-sectional survey of 100 randomly selected high school sophomores in a large suburban community in the United States. What is interesting is that they found that of those adolescents who smoked and who had at least one smoking parent, 12.5% were males and 87.5% were females. The large difference between males and females may be due to the presence of other risk factors which affect both mothers and daughters. The researchers did not attempt to explain this "gender difference" but it appears that other factors (e.g., the home environment, abuse) may influence the smoking behavior.

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Parents and others can also have an effect on physical activity levels. Table 4 provides data in relation to the percentages of fathers and mothers who encourage adolescents to “often” take part in physical activities in their spare time (Health and Welfare Canada, 1992). It is important to note the decrease in the percentages of fathers who encourage their daughters to be physically active and the decrease of encouragement overall with age (e.g., less encouragement given to youth when they are 15 in comparison to age 11).

Table 4 Health of Canadian Youth: Exercise Participation Encouragement

	Males age 11	Males age 13	Males age 15	Females age 11	Females age 13	Females age 15
Fathers encourage them to take part: “Often”	46%	44%	30%	31%	28%	23%
Mothers encourage them to take part: “Often”	42%	39%	29%	40%	33%	29%

Extracted from Figure 3.6 and 3.7 “The health of Canada’s youth,” by Health and Welfare Canada, 1992, Minister of National Health and Welfare.

The Canadian Youth Survey (Health Canada, 1996) also investigated reasons why young people started smoking. The most common reasons cited for beginning to smoke included: friends smoke/peer pressure, curiosity, and “it’s cool” (Health Canada, 1996). While there is some evidence to suggest *why* adolescents try smoking, one limitation of the research is that it is unclear as to *what* influences them to continue smoking. What is also unclear is the meaning adolescents place on words such as “peer pressure” and “curiosity”. Although an adult might say that the most common reason for youth to begin to smoke is peer pressure, adult researchers do not have a full appreciation

for what “peer pressure” means from the adolescent perspective and how it is associated with smoking behavior.

Stress/Anxiety

Many intense feelings can occur during adolescent development. The major stressors that confront many adolescents include: body image, identity, independence, social role and role conflict, hormonal changes, and sexual behavior (Lipp, Deane, & Trimble, 1996; Redston-Iselin, 1995). These stressors can trigger a number of emotions such as anger, sadness and anxiety in the adolescent. Although all emotions are important, the intent in this study was to examine anxiety more closely.

The term anxiety means different things to different people and is not easily described or measured. Throughout the literature the terms “anxiety” and “stress” are often used interchangeably. Many authors have discussed the nearly impossible task of distinguishing anxiety from stress and have suggested that these terms can and often do mean the same thing (Kutash, Schlesinger, & Associates, 1980; Rice, 1987).

Taylor and Arnow (1988) have stated that “anxiety is a universal emotion” (p. 1). Beck, Emery, and Greenberg (1985) conceptually define anxiety as, an unpleasant, undesirable, tense emotional state that is often associated with unpleasant feelings such as tension or nervousness, and by physiological symptoms such as nausea, heart palpitations, and syncope. Anxiety involves physiological, behavioral, cognitive and affective responses (Beck, Emery, & Greenberg, 1985; Stuart, 1995; Taylor & Arnow, 1988).

Stress has been defined as being either a stimulus or a response (Lazarus & Folkman, 1984). Lazarus & Folkman further describe stress as an organizing concept consisting of many variables and processes that assist in

understanding phenomena of human adaptation. Anxiety in this study was examined in relation to stressors experienced by adolescents.

Stress or anxiety have not been identified as specific factors that influence smoking behaviors. The claim that smoking has a stress reducing effect is controversial (Parrott, 1994). Some studies with adults have found that smoking reduced subjective stress (Jarvik, Caskey, Rose, Herskovic, & Sadeghpour, 1989; Perkins, Grobe, Fonte, & Breus, 1992; Pomerleau, & Pomerleau, 1987), while others have found little or no effect (Cohen & Lichtenstein, 1990; Fleming, & Lombardo, 1987; Hatch, Bierner, & Fisher, 1983; Morse, 1989). According to Perkins et al. (1992) smoking may have different effects on different individuals. These effects may be dependent on the subjective state of the smoker at that particular time. Perkins et al. (1992) found that adult smokers who were under a high challenge task had sharp reductions in stress immediately after smoking. The reduction in stress was very transient and had usually disappeared 10 minutes after smoking. Interestingly, Wheatley (1993) using a general stress questionnaire administered to adults, reported that active smokers have higher stress scores than non-smokers. If smoking is an effective anxiolytic agent smokers should have lower stress scores than non-smokers, but this is not the case. The stress scores of the smokers were *prior* to beginning the habit of smoking is not known.

Two longitudinal studies looking at smoking-cessation programs in adults found that smoking-cessation in fact led to reduced stress overall (Cohen and Lichtenstein, 1990; Parrott, Craig, & Phillips, 1993). Overall, even if smoking does in fact decrease stress, the physiological and pathophysiological consequences as described earlier are irrefutable.

Anxiety can play a significant role in the overall health of an individual.

According to a number of retrospective studies in the adult cardiovascular literature a positive relationship has been demonstrated between anxiety and CVD, that is, anxiety may increase the development of CVD (Hayward, Clark, & Taylor, 1990; Moran, Mazzocco, Fiscus, & Koza, 1989; Pomerleau, Pomerleau, Mcphee, & Morrell, 1990; Thiel, Parker & Bruce, 1973; Zyzanski, Jenkins, Ryan, Flessas & Everist 1976). Hayward, Clark and Taylor (1990), in their literature review of anxiety and CVD risk found inconclusive results regarding the relationship between anxiety and CVD. The authors speculated that the inconclusive results could be due to small sample sizes and a variety of instruments being used to measure anxiety.

Thiel et al. (1973) found that anxiety was often present for long time periods prior to the diagnosis of coronary artery disease. In cardiovascular research, there is controversy regarding the extent to which anxiety impacts on the development of CVD. Some health care providers consider anxiety to be a dependent variable that is associated with other cardiovascular risk factors. It is thought that anxiety *per se* is not an independent variable that can cause or influence the development of CVD (Heart & Stroke, 1993). Anxiety may be viewed both an independent and dependent variable and can influence CV health at any stage. However, the relationship or influence that anxiety has on other factors such as smoking and physical inactivity requires further study.

Emotional responses of adults according to Friedman and Rosenman (1988) and Jenkins (1988) are associated with angina pectoris, cardiac arrhythmias and death. In the CV research literature (as previously stated above) the terms "anxiety" and "stress" are often used interchangeably which makes it difficult to understand precisely what is being examined. In some of the literature related to the CVRF of smoking and physical inactivity, anxiety or stress has been identified. These studies (Cohen & Lichtenstein, 1990; Fleming,

& Lombardo, 1987; Hatch, Bierner, & Fisher, 1983; Jarvik, Caskey, Rose, Herskovic, & Sadeghpour, 1989; Morse, 1989; Perkins, Grobe, Fonte, & Breus, 1992; Pomerleau, & Pomerleau, 1987; Raglin, 1997; Yeung, 1996), have been described in the previous sections on physical inactivity and smoking.

Anxiety in relation to cardiovascular risk in the adolescent population has been poorly investigated and understood. It is generally accepted that the transition period of adolescence can cause intense feelings and issues that threaten the adolescents' defenses (Redston-Iselin, 1995). It is important to understand anxiety within the context of adolescents in their environment. Anxiety and how it may influence cardiovascular health must be understood in relation to a number of factors including: adolescent transition experiences, peer pressure, beliefs, environment, and individual and family/other expectations.

In the studies addressing adolescents and CVD some researchers mentioned the term anxiety or stress, but the majority of authors did not clearly address or even mention anxiety or stress. Byrne, Byrne and Reinhart (1995) investigated different stressors and the decision to commence cigarette smoking in adolescence. They found that females reported higher levels of stress than males in relation to family conflict, parental control, school performance, future uncertainty, and perceived educational irrelevance, but not in the areas of school attendance or stress of opposite sex interactions. Byrne, Byrne and Reinhart (1995) also found that there was a statistically significant correlation between adolescent and parent scores in relation to identified life event stressors (the internal reliability of the instruments used ranged from a Cronbach's alpha of 0.75 to 0.85, $p < 0.001$) (Byrne, Byrne & Reinhart, 1995).

Pebler, Hester and Connor (1987) found 51% of adolescents reported

experiences of stress. Stress was reported to occur two to three times a week by the majority of students, moreover the majority of those reporting stress were female. Although these authors stated they were investigating *stress* their discussion related to how many times students felt *anxious* during the week.

Stress and anxiety play a part in risk-taking behaviors. In addressing anxiety in the adolescent population one needs to understand the context and appraisal from the adolescent perspective. Asking adolescents what makes them anxious and how they respond when they are anxious may provide information regarding risk factors (such as smoking and physical inactivity). Descriptive data regarding anxiety in this population in relation to CVRF and CVD provides essential baseline information needed prior to the development of strategies and intervention programs aimed at changing or modifying behaviors. Further research is needed to understand the relationship between stress/anxiety and CVD.

It is important for researchers to clearly state their conceptual and operational definitions in order for a meaningful interpretation of the research to be made. The operational definitions used in the present study are outlined in Chapter 3. It is also clear that anxiety and the possible influence it may have on physical activity and smoking behaviors is not well understood, particularly in the adolescent population. In the present study students were asked to choose stressors from an identified list in the questionnaires. During the focus group sessions adolescents were asked to describe what caused them stress/anxiety. Initially the term "anxiety" was used in the questionnaire items but was changed to "stress/anxiety" after pilot testing. Rationale for the change is provided in Chapters 5 and 6.

Cognitive Appraisal

In order to understand risk-taking behaviors in the adolescent population one needs to understand the context and appraisal from the adolescent perspective. Cognitive appraisal allows the individual to process an event in terms of how it affects them personally (the situation may be seen as a threat, a possible harm, or, as a challenge). Their interpretation of the event, keeping in mind both the cognitive knowledge and beliefs, and the developing roles and responsibilities will determine whether or not the adolescent will participate in risk-taking behaviors.

Summary

Overall, the literature on factors influencing smoking and physical activity/inactivity in adolescents is scant and more research is needed in this area. In both adult and adolescent research on smoking, investigators have measured the number of cigarettes smoked *per se* as opposed to examining the underlying reasons for smoking behavior and related risk factors. It is important to understand the role smoking plays for the adolescent, and other factors that influence smoking behavior.

Physical activity is very valuable in promoting both physical and psychological health. Physical activity levels in adolescents varies depending on the research study and the definitions of what constitutes "being physically active". More research is needed into identifying baseline physical activity levels and intensity in adolescents. Research is also needed to more clearly identify and describe factors that influence physical activity/inactivity. There are gaps in the literature concerning knowledge about the significance and meaning of behaviors and beliefs from the adolescent perspective in relation to the CVRF of smoking.

Based on the review of the literature a conceptual framework has been developed (Figure 1). As may be seen, knowledge and beliefs and influences on behavior can affect risk perception and the risk-taking behaviors (smoking and physical activity/inactivity). Being able to identify and understand the influencing factors from the adolescent perspective and how they relate to risk-taking behaviors is important. This framework is not meant to be linear but instead represents the multidimensional complexity of risk-taking among adolescents.

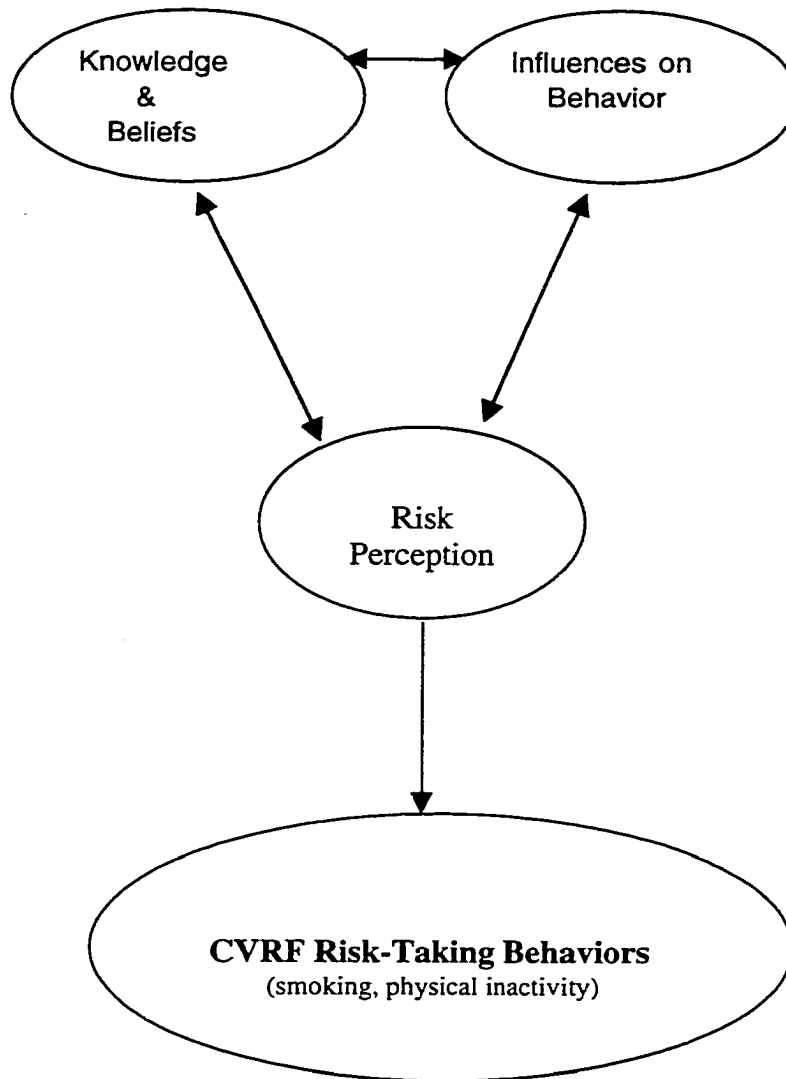


Figure 1. Conceptual Framework – Adolescent Risk-Taking Behaviors.

CHAPTER 3

METHODS

Research Design

An exploratory/descriptive design, incorporating methodological triangulation (Morse, 1991) was used which incorporated two methods: 1. Self report questionnaire and 2. focus groups. As outlined in Chapter 1 the objectives of study were to:

- ascertain adolescents' smoking frequency and participation in physical activities
- assess adolescents' knowledge regarding the cardiovascular risk factors (CVRF) of smoking and physical inactivity
- identify the factors that adolescents think influence these CVRF
- explore what adolescents think regarding the effect of anxiety and the CVRF of smoking and physical inactivity in themselves and other adolescents

Because little is known regarding cardiovascular risk factors, beliefs, and risk behaviors in the adolescent population, both qualitative and quantitative methods were used to increase the depth and breadth of the data gathered and to validate the findings. A questionnaire was used to determine the prevalence of CVRF and identify the knowledge base of adolescents regarding CVRF in a sample of Grade 9 students. The focus groups built upon the questionnaire to gather more in-depth information regarding perceptions and beliefs regarding CVRF and anxiety in a subset of the same sample.

Operational Definitions

For the purposes of this study the following operational definitions were used.

Smoking

Smoking refers to the smoking of cigarettes and does not include the use of smokeless tobacco. The stages of smoking are: trying/initiation (first cigarette ever), experimentation (smoking occurs less than once a week), regular smoking (smoking occurs more than once a week), and nicotine dependence (physical and psychological craving for cigarettes) (Winkelstein, 1992).

Physical Activity

The term *physical activity* refers to the regular participation in either structured or unstructured activity at least 3 to 5 times per week for at least 30 minutes (Heart & Stroke Foundation, 1993; Health and Welfare Canada, 1992). The terms *physical activity* and *exercise* are used interchangeably. Participation 2-3 times per week was further defined as being *moderately active* and more than 3 times per week as being *very active*.

Physical Inactivity

In the context of the present study *physical inactivity* was conceptually defined as the lack of participation in regular physical activities at least once per week.

Excessive Physical Activity

Excessive physical activity refers to strenuous activity that an individual engages in for extended periods every day during the week which results in

deleterious physical and psychological effects.

Cognitive Knowledge and Beliefs

Cognitive knowledge denotes the basic intellectual development, while beliefs refers to the what the adolescents believed to be true.

Influences on Behavior

Refers to any influence from individuals, or self and other factors (such as anxiety, self-concept) that may influence adolescent behaviors.

Self-Concept

Self-concept involves the development of self and an individual identity, while the value that individuals place on certain aspects of the self is self-esteem (Kaplan, 1986).

Body Image

Body image is how individuals perceive themselves.

Rebellion

Rebellion refers to resistance to authority.

Anxiety

The term “anxiety” refers to the unpleasant emotional, undesirable, tense emotional state that is often associated with unpleasant feelings such as tension or nervousness, rather than the broad construct of “stress” (Beck, Emery, & Greenberg, 1985). It is important to note though that this term was used synonymously with the term stress by the adolescents.

Recruitment and Sample

Recruitment Description and Rationale

The target population for this research study consisted of Grade 9 students in a major urban centre. A pilot test of the questionnaire and the focus group questions was done with eight students (3 females, 5 males) in a different school from those used in the larger study. In the study, a sample of 56 Grade 9 students completed the questionnaire. A sub-sample of those who completed the questionnaire was selected to participate in focus groups ($n = 34$). The specific description of the sample is discussed in the following section.

Two Junior High Schools from an urban School Board of Education were selected to recruit students for the study. Students from Junior High Schools who were presently or had previously participated in a cardiovascular heart health education research project were excluded due to the potential for bias and contamination of data in the present study. Participants were recruited over a 4 month period. Initially the researcher arranged meetings with the Principal and/or Vice Principal of each school to explain the study and to answer any questions. The researcher also offered to meet with all Grade 9 teachers to explain the study and to clarify their involvement. The Vice Principal of each school decided that meeting with the teachers was not necessary as the study would be discussed at a staff meeting and any questions would be directed back to the researcher. No questions were received. A letter of explanation of the study and information was provided to each of the Grade 9 Home Room teachers as well as the Vice-Principal/Principal (see Appendix A).

Following agreement of the school to allow the researcher to conduct the study a mutually convenient time was arranged to meet with the students and teachers. Grade 9 adolescents from the selected urban schools were approached in class by the researcher and/or research assistant. All students

from each school who consented to participate (consent procedure is described later in this chapter) were given the risk factor questionnaire (combined $n = 57$ from the two schools). Groups of 6 - 10 students were then placed into males only, females only, or mixed groups to participate in the focus groups. After the first three focus groups were conducted it was decided by the investigator to do another all-female focus group because some themes emerged from the first all-female focus group which were not identified in the other two focus groups. The investigator wanted to explore further those findings with another all-female group.

Four focus groups were facilitated. Each group had between 6-10 participants except the all-female groups of which one had only 5 members (one student was ill on the day of the focus group session) and the other female group inadvertently had 12 females (one participant had been ill and was replaced with another, and both arrived for the focus group session; one participant unexpectedly arrived at the end of the focus group when only approximately five minutes were left in the focus group session).

In summary, the focus groups were as follows: two groups had females only ($n = 5$ and 12 respectively), one group had males only ($n = 9$), and one group had both females and males ($n = 6$ males, 4 females). The rationale for the different group compositions was to explore beliefs regarding risk factors, the reasons behind behavior, barriers, and perceptions from different adolescent perspectives and genders. It is important to recognize that some gender based differences have been identified in risk factors. For example, differences have been found between males and females in relation to prevalence and beliefs regarding risk factors such as smoking, physical inactivity, and obesity (Peblar et al., 1987; Rabbia et al., 1994). Conducting several groups on the same topic, while varying characteristics of the group

achieved a diversity of opinions, from which a more comprehensive knowledge base could be developed (Dilorio et al., 1994).

Adolescents often feel threatened, self-conscious about their bodies, and vulnerable because of the rapid rate of adjustments (biological, psychological and social changes) taking place (Bensinger & Natenshon, 1991; Wodarski, 1989). Limiting participants to 6 -10 in a focus group allowed a more effective and supportive group rapport to be established with the group facilitator (Krueger, 1995). Smaller groups of participants allowed the researcher to explore specific behaviors and perceptions in depth. Small group sizes also encouraged more participation by members who might be more reluctant to participate in larger groups (Greenbaum, 1988). Different focus group composition (males, females, and mixed males and females), also encouraged more participation and a less threatening atmosphere.

Adolescent males and females have different interests, and therefore may relate to the focus questions quite differently (Greenbaum, 1988). By having some separate groups these differences can be recognized and more fully understood. Peer pressure also may be lessened when dealing with same sex individuals, since it is not as important to "show off" or to conform to the norm in front of the same sex (Wodarski, 1989).

Age

The age of Grade 9 students may vary between 13 - 16 years. Adolescents from this age range are generally considered to have the cognitive ability to think abstractly, to make hypotheses, and to draw conclusions (Hendee, 1991; Piaget, 1969; Wodarski, 1989; Wong, 1993). These factors helped to facilitate discussion regarding a range of experiences, opinions, and ideas. It was important to ensure that the adolescents participating in the

focus groups were not cognitively impaired or delayed in order to maintain a more homogeneous group. This was facilitated in collaboration with the students' teachers prior to students being approached to participate in the study.

A three year age spread from 13-16 years does not appear to be long in the human life span. However, with respect to this particular age group, consideration was given to wide developmental variations among adolescents during this time. Adolescents' experience different rates of physical, sexual, and psychological maturation. Each adolescent goes through this at different times (e.g., a 13 year old may be developing rapidly and a 15 year old may not have started developing). In one context adolescents may be classified as children, and in another they may be viewed as young adults (Wodarski, 1989). Age was taken into account during the analysis and is described in Chapter 5.

In developing an understanding of the factors that influence CVD risk factor prevalence, it is important to identify, and acknowledge the broad beliefs, and behaviors that occur over time. The intent of the focus groups was not to identify only limited behaviors and beliefs specific to adolescents, but to develop a broad understanding of the complexity and depth of the beliefs adolescents face as they are developing physically, sexually and psychologically. Risk factors for CVD in adolescents need to be understood in relation to the biopsychosocial and contextual factors that affect their lives. Although the age distribution and behaviors may vary in Grade 9 students, only one school grade was used from which to select participants to allow for a "cleaner" and more closely related group from which knowledge can be generated (personal communication, Dr. A. McKeough, Department of Educational Psychology, Dec, 1996).

Sample Description

As mentioned in the previous section a pilot test was conducted with eight Grade 9 students (3 females, 5 males) who completed the risk factor questionnaire and participated in a focus group. Following the pilot test the risk factor questionnaire, and the focus group questions were re-evaluated and revised. Wording was changed in a number of items based on students' comments regarding lack of understanding of terms and phrases. In particular students stated they did not understand what was meant by anxiety. When the term *anxiety* was explained by the researcher, students stated that they understood anxiety to be "stress". Because of the student comments the term stress and anxiety were used together in the items in the risk factor questionnaire and in the focus group questions.

Following the revisions to both the questionnaire items and focus group guiding questions, all Grade 9 classes (n = 12 classes, 20-27 students per class) in two large urban schools were provided information regarding the study and were given consent forms. School #1 had 101 students in 4 classes. Consent forms returned from the four classes in school #1 included: 36 completed acceptance forms, one refusal form and 10 blank forms. Consent forms returned from the eight classes in School #2 included: 21 completed acceptance forms, 10 refusal forms, and approximately 15 unopened consent forms and letters (see Table 5). During recruitment there was an unusually high absentee rate due to a severe flu epidemic. Normally absenteeism is at most about 10% on any one day (personal communication, School #2 Vice Principal). In School #1 the absentee rate was estimated by the Vice-Principal as between 20-30% on the day that the consents were handed out. In School # 2 the absentee rate was even higher, with 40% absenteeism in some of the Grade 9 classes and 50% in others. The first school participated in the research at the

beginning of the flu season, while the second school was approached when the incidence of flu reached epidemic proportions (personal communication, Emergency Department Physician, February, 1998). This temporal difference during the "flu season" may account for the variation in completed and returned consents between the two schools.

Table 5 Consents Distributed/Returned

	# Students in Grade 9	Accepted	Refusals	Incomplete /Blank	Absentee Rate
School # 1	101	36	1	10	20-30%
School # 2	≈ 200	21	10	15	40-50%

A total of 57 adolescents participated in the study, 63.2% (n = 36) from School # 1, and 36.8% (n = 21) from School # 2 (Table 6). The questionnaire was completed by all 57 adolescents and a sub-sample of 14 boys and 21 girls participated in the focus groups. There were two female only focus groups (#1 n = 5, #2 n = 12), one male only focus group (n = 8), and one mixed male and female focus group (n = 6 males, 4 females). Two focus groups were facilitated in each of the two Schools. An all-female focus group was facilitated in both schools (School # 1, n = 5, School # 2, n = 12), and School # 1 had the mixed focus group (n = 10), and School # 2 had the all-male focus group (n = 8).

Table 6 Sample

	Males n	Females n	Questionnaires completed n (% of sample)	Focus Groups
School #1	18	18	36 (63.2%)	1. Mixed (n = 6 males, 4 females) 2. Female only (n = 5)
School # 2	8	13	21(36.8%)	1. Male only (n = 8) 2. Female only (n = 12)
Total Sample	26	31	57	4 (n= 14 males, 21 females)

Questionnaire and Focus Group Data Collection

The investigator was involved in initial contacts and distribution of consent forms to both schools. The investigator administered the questionnaires with the assistance of an experienced research assistant (who was also an experienced focus group facilitator) to the pilot group and the students in School #1. The investigator was the observer for the pilot and the first two focus groups. A second research assistant was the observer in the last two focus group sessions. The original research assistant was the focus group facilitator for all 5 focus groups (1 pilot and 4 in sample).

The students who participated in the study met in a room away from their class to complete the questionnaire. The time to complete the questionnaires was approximately 20 minutes which included the time for the instructions to be given.

Data Collection

Risk Factor Questionnaire - Smoking and Physical Inactivity

The first part of the survey questionnaire gathered data regarding cardiovascular risk factor prevalence and knowledge adolescents have regarding physical activity and smoking. This questionnaire was developed by the investigator based on a review of the cardiovascular literature and

previously developed tools (Health and Welfare Canada Smoking and Health Survey's) from both the adolescent and adult populations (see Appendix B for both original and revised Risk Factor Questionnaires). Items were included regarding: the risk factors of smoking and physical inactivity; what influenced the risk factors; and the impact of stress/anxiety on the risk factors of smoking and physical inactivity. Face and content validity of the tool were established by two expert cardiovascular clinicians (one with an adolescent focus). The questionnaire was evaluated by two professors in a Faculty of Nursing with expertise in questionnaire construction. The reading level of the questions was checked to ensure questions were at no higher than Grade 6 English reading level. The risk factor questionnaire was also pilot tested using a convenience sample of male and female adolescents (n = 8). The tool was then re-evaluated and revised accordingly prior to commencement of the study.

Focus Group

Following the administration of the risk factor questionnaire a focus group session was conducted within 48 hours. The rationale for conducting the focus groups as soon as possible following questionnaire completion was that it allowed exploration of reasons for specific behaviors (e.g. smoking) while the information regarding how they filled out the questionnaire was still fresh in participants minds.

Conducting focus groups involves blending techniques from both group process theory and qualitative research (Dilorio et al., 1994; Morgan & Krueger, 1993). In the present study focus groups were used to gather the opinions of adolescents, and to validate perceptions and beliefs within the group about what was important to them regarding behaviors, and knowledge of cardiovascular risk factors. The focus group questions were used as a

guide for the facilitator to follow. The questions were broad in nature and it was the responsibility of the facilitator to maintain clear direction during the focus group. The questions were used as a guide and were not viewed as being "set in stone" as this would have defeated the purpose of the focus group (Morgan & Krueger, 1998). The focus group questions are listed in Appendix C.

The overall purpose for the research was to gain insight into adolescents' knowledge and understanding regarding cardiovascular risk factors, and to identify behaviors, beliefs, and perceptions related to those risk factors. The focus groups were used as a means of facilitating discussion of ideas and building on the data gathered from the questionnaire previously administered. It was expected that differences in opinions, beliefs, and knowledge of adolescents regarding risk factors for CVD, would be evident and might be related to differences such as developmental stage, cognition, age, past experiences, and gender. It was important that these differences be recognized and documented for future consideration in developing knowledge, strategies and programs to influence subsequent health behaviors.

Focus Group Facilitator and Observer Roles & Observations

Prior to each session the facilitator and the observer met to discuss the process and develop a strategy. Meeting prior to each focus group facilitated a smooth and more effective focus group (Morgan & Krueger, 1998). The facilitator and observer also met to compare observations and findings immediately following each session, a few days later and after all focus groups were completed. The roles of both the focus group facilitator and observer were described to the adolescents at the beginning of each focus group.

Focus Group Facilitator

The facilitator for this study was a registered nurse who was both an experienced interviewer, and who also had previously worked with adolescents. She played a key role in conducting the overall discussion. The facilitator “sets the mood of the group by creating a non-threatening, warm, accepting, enthusiastic, and objective environment, which encourages all group members to share their views” (Reiskin, 1992, p. 200). Her role in this study included the following:

- elicited input from the adolescent group to achieve the overall objective which was to gain insight into adolescents’ knowledge and understanding regarding CVRF and influencing factors
 - facilitated interaction among adolescents
 - added comments and probing questions to help focus the group
 - validated what was being said, acknowledged comments from individuals and encouraged expansion and discussion from other group members
 - sought participation from all participants
 - kept the discussion on track and summarized the discussion
- (Adapted from Greenbaum, 1988; Kingry et al., 1990; Reiskin, 1992)

The investigator developed a general interview guide for the focus group facilitator to help direct the discussion (see Appendix C). The questions were based on the general areas as outlined in Chapter 1, but were not meant to be all-inclusive or restrictive. The focus group facilitator had a strong knowledge base in relation to risk factors associated with CVRF and was able to pose questions to facilitate understanding of behaviors, but did not control the group. She helped focus the discussion, and encouraged exploration of similarities and differences of adolescents within the group (Dilorio et al., 1994; Greenbaum, 1988). Overall, the focus group facilitator was open, honest and demonstrated excellent communication skills. The adolescents had no difficulty

in understanding her and she very quickly was able to engage the group in discussion.

Observer

The investigator was the observer for 3 focus groups in the study (pilot, first all-female, and mixed group). A research assistant was hired to observe in the last two focus groups. The observer was not involved in the direct conversations of the group, but observed the discussion to identify: verbal and nonverbal cues; how individuals participate; and with whom they participate (Dilorio et al., 1994, Greenbaum, 1988). In order to be part of the group but not interfere with the activities of the group, the observer was part of the circle, but was seated slightly behind the participants. The observer was able to identify group dynamics, such as who talked to whom, and whether or not the verbal statements matched the nonverbal behaviors. The observer, according to Greenbaum (1988) should attempt to pick up innuendoes or interpretations of the discussion, but should not to draw conclusions while listening to the group discussion. In addressing the behaviors, beliefs and perceptions of adolescents regarding CVRF what was not said but was observed, was as important as what was said. The information gathered from the observer was important in helping the researcher interpret data and develop themes.

Setting & Process

The setting and location of the focus group is crucial to its success (Dilorio et al., 1994; Greenbaum, 1988). The environment must be comfortable and accessible to the participants, yet must seem to be a “safe” place in which opinions and views can be expressed without fear of retribution (Dilorio et al.,

1994; Smith, 1995). Consideration must also be given to the room characteristics such as size, light, temperature and seating arrangements (Dilorio et al., 1994). The room should match the group size; too large, or too small rooms might be uncomfortable, and may detract from the group interaction.

In this study the focus group sessions were facilitated in a variety of places. It was decided that the sessions would be conducted during school hours because many of the adolescents took buses home, and had to leave immediately after school was dismissed. According to Morgan and Krueger (1998) agreement between participants and the facilitator regarding location and time for the focus group sessions allows the participant more control, and may increase an individual's willingness to participate. The investigator and research assistant met with the Vice-Principal of each school and discussed possible locations for the focus group sessions. The rooms used for the focus group interviews were booked by the Vice-Principals. Both schools had limited space available and although the investigator and research assistant had described their requirements, some rooms were not the best suited for conducting focus group interviews. For example, one of the sessions was set up in the library. Although this is a quiet area, it is also a open area and other individuals (e.g., librarians) are in the room, which is not necessarily conducive to open sharing. In order to deal with this some groups were rescheduled and library access was restricted to participants during the focus group sessions. The importance of maintaining confidentiality was discussed with both librarians, and the session took place as far as possible from the main circulation desk. Students were reassured regarding confidentiality of the information presented.

The investigator supplied donuts/muffins and juice for each focus group

session and also for all students who completed questionnaires. The school rules normally prohibited food and beverages in the library, but for the session that was held in the library the Vice-Principal, who was very supportive of going ahead with the focus group session, agreed to allow food and beverages during that time period. Students were informed of the "bending of the rules" for this session only. Care was taken to ensure that no food or beverages were spilled or left in the library after the session.

Even though every effort was made to make the library a conducive area to interview, at the beginning of this session it was apparent that there was hesitancy in the discussion. After the first 15 minutes of the session a number of students asked again about confidentiality, specifically who had access to the completed questionnaires and who would hear the audio tapes. It was obviously a concern for the students and they were again reassured as to how confidentiality would be maintained. This seemed to engender trust, and following the explanation the group appeared to be much more open and willing to share thoughts, beliefs and behaviors.

Two of the other focus group sessions were conducted in classrooms and the fourth in the counsellor's room. As with the library setting the counsellor's room was not necessarily an ideal area in which to have a focus group. The researcher was concerned that, if adolescents had mixed feelings about the room or had had bad experiences about being sent to the counsellor this might have been detrimental to the group process. It was difficult to ascertain if the adolescents in the focus group housed in the counsellor's room had any objection to having the session in that room, but as the discussion progressed it became apparent that the surroundings did not seem to interfere with the group process.

Seating arrangements need to facilitate an openness, and maximize

interactions among the participants (Dilorio et al.,1994). The investigator and focus group facilitator arranged the room for each of the focus groups prior to the adolescents arriving. Tables or chairs were arranged in a circular fashion, as this is reported to increase interaction (Greenbaum, 1988). The adolescents were allowed to choose their own seating place. This was an interesting process to observe as many adolescents moved the desks or their chairs in order to sit beside specific peers. In the session with the mixed group the females and males tended to sit with others of their own gender.

Another consideration with regard to the focus group setting was the need to ensure that distracting items were controlled as much as possible. In all rooms the focus group was set up away from the windows, or the window blinds were partially closed, the doors to the room were closed and possible distractions in the room (such as displays) were moved away from the focus group area. Distractions such as windows, high traffic areas, telephones, and elaborate furnishings were avoided whenever possible, since they can shift the focus away from the topic of discussion (Greenbaum, 1988). One aspect that the investigator did not have control over was the use of the school intercom. As the sessions were done in the school any announcements over the intercom were also heard in the session. This was distracting for both the investigator and the focus group facilitator but it was obviously something that all of the adolescents were accustomed to because they did not seem to notice the interruptions.

Mutual setting of a focus group meeting time would be the ideal if possible (Asbury, 1995; Morgan & Krueger, 1998). In both schools the time set up for the focus group sessions was negotiated with the Vice Principal, the Grade 9 teachers and the investigator. Students participating in the study in fact did miss part of their classroom time, which according to the students

was more of a bonus than a concern. Students were not told about the possibility of missing classes if they participated in this study when consents were handed out. All that the investigator and teachers stated was that it would take place sometime during the school day. The reason that students were not told about the possibility of missing classes was so that this did not act as an inducement to participate in the study. This was a deliberate choice to ensure the ethical guidelines of the University of Alberta were upheld.

Focus groups were conducted immediately, or as soon as possible following questionnaire completion as previously described. Arrangements with students who were participating in the focus group sessions were made prior to the administration of the questionnaire, so as to not single out those who were and those who were not participating in a group interview. The focus groups were planned for approximately one hour, but an additional 15 minutes was allotted to handle any information needs, comments, or questions that the adolescents might have. As suggested by Asbury (1995), the length of the sessions may vary depending on the number of participants, the complexity of the discussion, and the interest in the topic. The time allotted for the focus groups overall was 75 minutes for each group (the first and the last ten minutes of the sessions were used for introduction and conclusions respectively). Seventy-five minutes appeared to be adequate, although there was often discussion with the researcher or focus group facilitator and individuals after the official sessions were completed.

Prior to the beginning of each interview the facilitator asked for permission to audio tape the session to ensure that parts of the conversation were not missed (Morgan & Krueger, 1998). Information was given regarding what would be done with the audio tapes and issues of confidentiality were addressed, as previously discussed. Because tape recorders in a room may

distract from the conversation and cause unnecessary interruptions (e.g., frequent tape changes), 90 minute tapes were used. The tape recorder was placed in the centre of the group which also ensured a more even audio recording of all participants. Despite the central placement of the recorder it was difficult to transcribe some of the conversations because of the quiet voices in the group. Two of the tapes had to be enhanced by communication experts. Following this enhancement the conversation was much easier to hear. All tapes were transcribed verbatim.

For the focus group sessions the focus group facilitator and the observer decided on appropriate attire, as this can make an impact on the group process (Greenbaum, 1988). In dealing with adolescents the facilitator needs to dress in such a way that the group feels comfortable, but he/she still maintains an authority figure within the group (Greenbaum, 1988). It is important that the adolescents can easily identify the moderator, and that her attire is not outlandish, or out of the ordinary. Although the literature suggests dressing for the specific focus group (Greenbaum, 1988), there was no "standard" dress code identified for the adolescent population. The focus group facilitator and observer dressed casually for the sessions. A number of adolescents whom the researcher knew agreed that dressing casually would be appropriate.

Data Collection Procedure

Once adolescents consented to participate in the study a mutually convenient time and place was arranged with the teens and their teacher. The researcher and research assistant administered the questionnaire to the group and then commenced the focus group sessions. Focus group sessions were held within 48 hours following completion of the questionnaire. As indicated

earlier this allowed the researcher the opportunity to follow-up with specific questions regarding the information and beliefs addressed in the questionnaires.

The focus groups were conducted by a skilled focus group facilitator and an observer was also present. As described earlier the observer was not involved in direct conversations of the group, but observed the interactions, listened to the discussion and recorded key observations. The observer took extensive notes during the interviews. This approach has been recommended by Greenbaum (1988).

As described in the setting and process section, the focus group sessions were audiotaped and transcribed verbatim to facilitate analysis. At the end of the focus group session the adolescents were thanked for their participation. They were also asked to complete a form regarding what was valuable about participating in this project, and what was the one thing that they liked and the one thing that they did not like about themselves. Specific questions are outlined in Appendix D. The literature suggests that these statements might be closely related to how adolescents saw themselves and this might give some insight into their behaviors in relation to CVRF and anxiety. The adolescents were assured of confidentiality and were asked not to sign their names on the forms. The forms also gave the researcher and research assistant some feedback on the focus group and gave the adolescents an opportunity to express ideas and beliefs that they might not feel "safe" or comfortable in discussing during the session.

Following the focus group session the facilitator and the observer met and debriefed regarding the content and process that occurred. This was followed by a write-up from both the facilitator and observer regarding salient findings and information from the session.

Data Analysis

Statistical analysis of the risk factor survey's demographic data included descriptive statistics of means, standard deviations, and ranges. Cross tabulations were done to compare variables of tobacco use, physical activity, anxiety patterns, and gender. Chi Square and Fisher's exact tests were done where cell numbers warranted. Independent t-tests and analyses of Variance (ANOVA) were computed in order to make comparisons among the different smoking status groups and physical activity status groups. Other Post-hoc tests included a Pearson product moment correlation between knowledge scores. From this analysis recommendations for further investigations have been identified.

Qualitative analysis began during the focus group process and continued after the session, through reflection on the process, and discussion with the observer (Greenbaum, 1988; Henderson, 1995; Morgan & Krueger, 1994, 1998). Analytic tools used for interpreting data included: facilitator notes, observer notes, audiotapes, transcription of the sessions, and thematic analysis (Greenbaum, 1988; Henderson, 1995; Morgan, 1993; Morgan & Krueger, 1998).

Both the facilitator and observer documented their observations and interpretations and compared their findings. An individual who was not involved with this study but did have a CV background was also involved in independently validating the themes that emerged from the interview data.

The analysis of the focus group data was done in relation to the intent of the study. Focus group analysis was completed as per the method described by Miles and Huberman (1994), Krueger (1994) and Morgan and Krueger (1998). Miles and Huberman (1994) describe the analysis as consisting of data reduction, data display and conclusion drawing and

verification. Krueger (1994) and Morgan and Krueger (1998) emphasize the importance of considering the words that are said, the context in which they are said, the internal consistency (possible changing of individual ideas during the discussion), the frequency or extensiveness of the comments, the intensity of the comments, the specificity of the comments (e.g., experience often carries more weight), and the identification of the three or four most important findings.

Data from the transcripts, the facilitator's and observer's notes were coded by the researcher, the research assistant, and an external reader. This coding included the underlining of key terms or words, and phrases in the transcripts and observation and field notes, and identifying and restating key phrases (Miles & Huberman, 1994). Following this stage the key phrases and underlined terms were reduced and broad clusters were created. Clustering of the coded data was done by putting together data related to each of the risk factors and the research questions. This clustering of condensed chunks helps set the stage for drawing conclusions (Miles & Huberman, 1994). The identified topics or themes were given a name or title. It is important that common themes be identified, using the ideas, language, and vocabulary from focus group sessions (Dilorio et al., 1994; Kingry et al., 1990). Themes were developed by the researcher and confirmed with both the focus group facilitator and the external transcript reader.

Scientific Rigor

The techniques described above were used to ensure scientific rigor of the data generated. Miles and Huberman describe five standards on which to evaluate the quality of conclusions for qualitative analysis: objectivity/confirmability; reliability/dependability/auditability; internal

validity/credibility/authenticity; external validity/transferability/fittingness; and utilization/application/action orientation (1994). The focus group facilitator developed a rapport with the participants which allowed for the development of a trust relationship and willingness of the adolescents to disclose information. The observer, as previously described did not participate in the focus group discussions. This allowed for an in-depth observation of both verbal and non-verbal cues. Both the focus group facilitator and the observer made meticulous notes following each of the sessions, and the sessions were audio-taped and transcribed verbatim. This "audit trail" as described by Miles and Huberman (1994) provides a record of the study's methods, procedures, results, analysis and interpretation.

The concept of reliability and confirmability was maintained by having an independent researcher, who had no vested interest in the study, review the transcriptions. The researcher and independent researcher then reviewed the findings, analyses and conclusions. This allowed for the identification of other themes that the researcher might not have recognized (Burns & Grove, 1993; Miles & Huberman, 1997).

Scientific rigor was also ensured by maintaining a consistent collection of data (questionnaire data collection followed by focus group discussion). A consistent format was also followed in relation to the focus group discussions. For example, prior to the discussion the facilitator spoke about the format of the discussion, and the confidentiality of the findings. The facilitator then guided the discussion based on the questions as outlined in Appendix C. Finally, the facilitator summarized the major elements that the group had discussed and validated this information with the adolescents who participated in the focus groups.

Compliance with Ethical Standards

Confidentiality was maintained at every stage in the research. Only the researcher, observer, and the supervisory committee have access to the data. Participants are not named at any point in the study, nor will their names be used in subsequent publications. Data collected were stored in a locked filing cabinet to which only the researcher has access. Data will be kept for five years after termination of the study. At the conclusion of the study, any information that might enable identification of subjects will be destroyed by shredding.

Ethical approval for the study was sought and obtained from three formal levels: The University of Alberta Health Sciences Faculties, Capital Health Authority, and Caritas Health Group: Health Research Ethics; The Education Ethics Committee, The University of Calgary; and the relevant School Board in a large urban centre. Ethical approval and permission to conduct the focus groups was also sought from the school principals and teachers involved. The second school also required permission from their School Parent Association. This permission was sought and unanimously granted.

Consent

Research in the adolescent and child populations has raised valid questions with respect to the entire process of obtaining consent. The terms *informed consent* and *assent* are used to describe different levels of consent when dealing with children. *Informed consent* has been described as, “an interactive process between subject and researcher involving disclosure, discussion, and a complete understanding of a proposed research activity, and which culminates in the individual freely expressing a desire to participate” (Broome & Stieglitz, 1992, p. 148). *Assent* refers to the affirmative

agreement of the child to participate in research. The ethical standard is considered lower in *assent*, as this type of consent only provides a preference for participation, and does not require understanding or reasoning ability from the child (Broome & Stieglitz, 1992).

Legally, *informed consent*, can only be given by those individuals who are 18 years of age or older and they must be autonomous and competent (Broome & Stieglitz, 1992). However, certain minors (“mature minors”) are deemed “emancipated” and are therefore to be treated as adults. Mature minors include those who are: self-supporting and/or not living at home; married; pregnant or a parent; in the military; or declared “mature minors” by the court (Committee on Bioethics, 1995).

The issue regarding consent in adolescents includes both developmental and cognitive capabilities of adolescents. It is suggested that adolescents who are not cognitively impaired or delayed, are able to think logically, to weigh risk and benefits of actions, and are seen to be able to make an informed choice regarding whether or not to participate in research (Broome & Stieglitz, 1992; Dorn, Susman & Fletcher, 1995). Dorn et al. (1995) examined the relationship of understanding of research participation to anxiety, control, and stage of cognitive development. They found that “emotional factors were more frequently related to understanding of research participation than age or cognitive development” (Dorn et al., 1995, p. 185). Differences in how the issue of consent is handled in adolescent groups occurs as a result of a host of variables including differences in: individuals, perceptions, purpose of the research, and contexts. In society, there is also a sense that adolescents face tremendous turmoil, are vulnerable, and can be easily influenced (Bensinger & Natenshon, 1991). These beliefs regarding adolescent turmoil, and being easily influenced have not been well studied, or validated, and it is important that the

adolescent group not be inappropriately labelled as being incapable of making decisions for themselves.

It is important to remember that the purpose of the research is to inform nursing practice, and help to better understand the variables that influence behaviors that result in increased CVD risk factors in adolescents. *Informed consent* was sought from the adolescents and their parent/guardian. The adolescents for this study were Grade 9 students who lived at home and resided in a large urban city. This sample provided a homogeneous group of adolescents from which data were gathered. "Out-of-mainstream" youth/adolescents (e.g., adolescents who live away from home, do not attend regular schools, and who have been placed in the care of the social or legal system) are often classified as adults since they do not reside with their parents, and may be self sufficient. The intent of this study was to look at adolescents who are still within the school system, and who live with their parents. As discussed earlier, because the adolescents still reside with their parents, the legal responsibility for the adolescent's care remains with the parents; therefore, it is important that the parents are given the option of providing or withholding consent for their teenager(s) to participate in the research study.

As part of the consent process the researcher met with the Grade 9 students to inform them of the research study and to explain their possible involvement. During the discussion with the adolescents regarding the research an information letter and consent forms were given to them to take home to their parents. It was required that both parents and adolescents give permission in order for the adolescent to participate in the study. Refusal from either parents, or adolescents was respected, and other possible participants and their parents were approached. A sample of the letter to the parents and

a consent form are contained in Appendices E and F respectively. A follow-up letter was sent to parents and adolescents one week after information and consent forms had been sent out, to remind them to complete and return the forms. A sample of the reminder letter is provided in Appendix G.

Research Protocol

Once University ethical approval was obtained the protocol for this research study was as follows:

- Step 1. permission obtained from an urban School Board to do the research study
- Step 2. met with the Principals of the two schools chosen to explain the research project and to gain their access permission
- Step 3. individual teachers of the Grade 9 classes were approached to gain access to the students at a mutually agreed time and location
- Step 4. discussed with the teacher exclusion of students with cognitive impairments (teacher to exclude students when consents returned)
- Step 5. researcher and/or research assistant spoke with students in class regarding the research project and invited them to participate
- Step 6. students were given the letter of information and the consent form for consideration and completion (by themselves and by their parent/guardian). Envelope to return consent provided with each letter of information and consent form
- Step 7. consent forms to be returned to a predetermined area in the student's Grade 9 home classroom
- Step 8. teacher(s) met with researcher to give consent forms
- Step 9. students who were selected to participate were notified and received instructions regarding a time and place for questionnaire administration
- Step 10. arranged with teacher(s) and Vice Principal a mutually agreeable time and place for the questionnaire administration
- Step 11. researcher and research assistant administered the questionnaires in a group setting
- Step 12. students for each focus group (group of females only, group of males only, and group of equal number of females and

males) selected from the completed consents returned that agreed to the teen's participation in the study. The selection was a convenience sample that was decided by the Vice Principal in each school and with the researcher. This was done to decrease numerous class disruptions. Students who were not selected were notified and thanked for their willingness to participate in the focus groups.

- Step 13. arranged with teacher(s) and the Vice Principal a mutually agreeable time and place for and the focus group session
- Step 14. researcher met with the focus group facilitator prior to the focus group to set up procedure and to discuss responsibilities
- Step 15. focus group sessions done with student. Students given form to complete at the end of the focus session.
- Step 16. thank-you to students (both individuals and to classes) for willing to consider participating (whether or not they did participate) and to thank those who did participate in the study
- Step 17. focus group facilitator and observer met following each focus group to discuss the session
- Step 18. focus group facilitator and observer separately wrote up observations and responses of the focus group and then discussed
- Step 19. facilitator and observer met and discussed notes
- Step 20. researcher met with an individual not involved in the research but with CV experience to validate themes developed by researcher and research assistant
- Step 21. researcher collated and analyzed data from all groups

CHAPTER 4

RISK FACTOR QUESTIONNAIRE RESULTS

The data were collected in two distinct phases: Phase 1 comprised the administration of the questionnaire; Phase 2 involved data collection from 4 focus groups. This chapter contains the questionnaire results only, and Chapter 5 will present the discussion of the questionnaire data. The focus group data and discussion are reported in Chapter 6.

In this chapter, the sample characteristics are reported first, followed by the results generated from the analysis of the questionnaire. Following a description of the sample characteristics, the questionnaire data are reported in relation to the research questions as outlined in Chapter 1. The questionnaire data were specific and dealt primarily with the CVRF of smoking and physical activity/inactivity and the influence of anxiety on those risks factors.

Analysis of the questionnaire data was limited primarily to descriptive statistics (means, standard deviations, and ranges). Fisher's exact tests were done on categorical data where cell sizes were sufficient. Chi Square tests were done on data where more than 2 x 2 tables were available, and when cell numbers were appropriate. Data related to smoking behavior are discussed in relation to participant smoking status: non-smokers; participants who had tried smoking but quit and, smokers. Data related to physical activity behavior are discussed at in relation to participant physical activity status: inactive, moderately active, and very active. Data where possible were also described by the combined smoking status and physical activity status categories. Independent t-tests and analyses of variance (ANOVA) were computed in order to make comparisons among the different smoking status groups and physical activity status groups.

Demographics

Demographic information was collected regarding the adolescent participants and their families. Variables included: gender, ethnic origin, allowance, job employment, job hours, employment status of parents, and family history of cardiovascular disease/heart disease.

Demographics: Participants

The demographic characteristics of the sample are presented in Table 7. A total of 26 males and 31 females participated in the questionnaire component of the study. The mean age of males and females was 14.1 and 14.0 respectively (range = age 13 - 15 for both males and females). The difference was not statistically significant ($t [40] = 0.56, p = 0.58$). No statistically significant difference was noted between the demographics of those participants who only completed the questionnaire and those who completed the questionnaire and were also part of the focus groups. Consequently the groups were combined and the data from the questionnaires were analyzed in their entirety.

Table 7 Mean age by Gender

	<u>N</u>	<u>Mean</u>	<u>Median</u>	<u>ST Dev</u>
Males	26 (45.6%)	14.1	14.0	0.65
Females	31 (54.4%)	14.0	14.0	0.41
Total	57 (100%)			

As may be seen from Table 8, the majority of the participants in the sample were Caucasian. Forty five of the participants were Caucasian (white), seven were Asian, four had mixed ethnic backgrounds, and one was African-American.

Table 8 Ethnic Background

	Males n (%)	Females n (%)	Total n (%)
Ethnic: White (Caucasian)	22 (84.6%)	23 (74.2%)	45 (78.9%)
African American	0 (--%)	1 (3.3%)	1 (1.8%)
Asian	2 (7.7%)	5 (16.1%)	7 (12.3%)
Native American	0 (--)	0 (--)	0 (--)
Other	0 (--)	0 (--)	0 (--)
Mixed	2 (7.7%)	2 (6.4%)	4 (7.0%)
Total	26 (100%)	31 (100%)	57 (100%)

Other Descriptive Data

Data were also collected on participants allowance, job employment and job hours. These categories relate to a number of research questions and will therefore be described here initially. Further description of these results in relation to the behaviors of smoking and physical activity/inactivity will be presented under each of the research questions as appropriate.

Allowance

Table 9 presents data regarding whether or not participants received an allowance. There was no statistically significant difference between males and females who did receive an allowance and those who did not ($p = 0.27$). The frequency of allowance and the amount of allowance received by participants can be found in Tables 10 and 11 respectively. There were also no significant differences between those who received allowance, the frequency of allowance ($p = 1.0$) or allowance amount ($p = 0.49$).

Table: 9 Participants Allowance Status, By Gender

	Males n (%)	Females n (%)	Total n (%)
Received Allowance	19 (73.1%)	18 (58.1%)	37 (64.9%)
Did not Receive Allowance	7 (26.9%)	13 (41.9%)	20 (35.1%)
Total	26 (100%)	31 (100%)	57 (100%)

Table 10 Frequency of Participants' Allowance, By Gender

	Males n (%)	Females n (%)	Total n (%)
Did Not Receive	7 (28.0%)	13 (41.9%)	20 (35.7%)
Daily	1 (4.0%)	1 (3.2%)	2 (3.6%)
Weekly	9 (36.0%)	8 (25.8%)	17 (30.4%)
Monthly	4 (16.0%)	7 (22.6%)	11 (19.6%)
Other	4 (16.0%)	2 (6.5%)	6 (10.7%)
Total	25* (100%)	31 (100%)	56* (100%)

* One male participant did not complete this question.

Table 11 Allowance Amount Received By Participants, By Gender

	Males n (%)	Females n (%)	Total n (%)
Did not Receive	7 (26.9%)	13 (42.0%)	20 (35.1%)
< \$5.00	0 (--)	0 (--)	0 (--)
\$6-\$10	8 (30.8%)	8 (25.8%)	16 (28.1%)
\$11-\$20	7 (26.9%)	5 (16.1%)	12 (21.0%)
>\$20.00	4 (15.4)	5 (16.1%)	9 (15.8%)
Total	26 (100%)	31 (100%)	57 (100%)

Participant Employment

The participants' job status is indicated in Table 12. No statistically significant difference was detected between males and females on job status or mean number of hours of work ($p = 0.79$). The mean job hours per week for male and female participants is outlined in Table 13.

Table 12 Participants' Job Status

	Males n (%)	Females n (%)	Total n (%)
Yes had a job	11 (42.3%)	12 (38.7%)	23 (40.3%)
No did not have a job	15 (57.7%)	19 (61.3%)	34 (59.7%)
Total	26 (100%)	31 (100%)	57 (100%)

Table 13 Participants' Job Hours per Week

	N	Mean	Median (Mdn)	ST Dev	SEMean
Males	11	10.86	4.50	11.60	3.50
Females	10	5.35	5.50	2.73	0.86

Demographics: Family

Data were gathered regarding the occupation of the parents of the participants in the sample. No data were gathered regarding who the participants resided with (e.g., parents, siblings or other individuals). Table 14 presents the occupation status of the participants' mother, and Table 15 presents the occupation status of the participants' father. Two of the participants' fathers were deceased and four participants did not indicate their father's occupation status.

Table 14 Job Status of Mother, By Gender

	Males n (%)	Females n (%)	Total n (%)
Full-Time	12 (50.0%)	14 (46.7%)	26 (48.2%)
Part-Time	8 (33.3%)	8 (26.7%)	16 (29.6%)
Not Employed	4 (16.7%)	8 (26.7%)	12 (22.2%)
Total	24 *	30 *	54 *(100%)

* Two males and one female did not indicate mother's occupation status

Table 15 Job Status of Father, By Gender

	Males n (%)	Females n (%)	Total n (%)
Full-Time	22 (95.7%)	28 (100%)	50 (98.0%)
Part-Time	1 (4.3%)	0 (--)	1 (2.0%)
Not Employed	0 (--)	0 (--)	0 (--)
Total	23* (100%)	28*	51* (100%)

*Two males and two females did not indicate father's occupational status. One male's father and one female's father were deceased.

Family History of Cardiovascular/Heart Disease

Family history of heart disease (HD) was assessed and participants who indicated there was a family history were asked to identify who in the family had HD (e.g., father, aunt). Table 16 presents data regarding whether or not participants had family history of heart disease. Approximately one third (31.6%, n = 18)) of participants in the study did not know if there was any history of HD in their family. There was no statistically significant difference between the participants who knew their family history regarding heart disease and those who did not ($p = 0.39$).

Table 17 presents data regarding who in the family had a history of heart disease. Grandfathers, grandmothers and aunts/uncles were ranked as being the top three family members with known HD (Table 17). Two participants identified other family members with heart disease. One female had a great aunt with heart disease and one male stated that he had heart disease. No statistical testing was appropriate due to the small cell sizes.

Table 16 Family History of Heart Disease, By Gender

	Males n (%)	Females n (%)	Total n (%)
Yes History of HD*	10(38.5%)	11(35.5%)	21(36.8%)
No History of HD	9(34.6%)	9(29.0%)	18 (31.6%)
Don't Know if History of HD	7 (26.9%)	11(35.5%)	18 (31.6%)
Total	26 (100%)	31 (100%)	57 (100%)

*HD = Heart Disease

Table 17 Family Members of Participants with Heart Disease, By Gender

	Males n (%)	Females n (%)	Total n (%)
Father	1 (3.9%)	0(0)	1(1.8%)
Mother	0(0)	1(3.2%)	1(1.8%)
Brother	1(3.9%)	1(3.2%)	2(3.5%)
Sister	0 (0)	0 (0)	0 (0)
Aunt/Uncle	2(7.7%)	4(12.9%)	6(10.5%)
Grandfather	6(23.1%)	8 (25.8%)	14 (24.6%)
Grandmother	1 (3.9%)	5 (16.1%)	6 (10.5%)
Other	1(3.9%)	1(3.2%)	2 (3.5%)

Summary of Questionnaire Demographic Findings

The self-reported demographic findings in this sample of adolescents can be summarized as follows:

1. A total of 57 participants participated in the questionnaire phase of the study.
 - 1.1 26 males and 31 females participated in the study. All

participants completed the questionnaire. A sub-set of 14 males and 24 females also participated in focus groups.

1.2 The majority of the participants were Caucasian (78.9%).

2. Other demographic variables of allowance and job status were as follows:

2.1 64.9% of participants received an allowance.

2.2 More males than females received an allowance. The difference between male and female participants receiving allowance was not statistically significant.

2.3 40.3% of participants reported having a job. The difference between male and female participants and job status was not statistically significant.

3.0 Demographic variables of family job status and history of cardiovascular/heart disease are as follows:

3.1 All participants' fathers worked (with the exception of two fathers who were deceased) and a majority of them also had mothers who worked.

3.2 36.8% of participants had a history of HD in the family. 31.6% of participants did not know if there was a history of HD in the family.

3.3 The difference between male and female participants and knowledge regarding whether or not there was a family history of HD was not statistically significant.

Research Questions

The following sections present results from the questionnaires in relation to the four research questions specified in Chapter 1. Background data that were gathered and relate directly or indirectly to the research questions are also provided.

Research Question #1: What is the frequency of the CVRF of smoking, and physical activity/inactivity in a sample of adolescents?

Smoking

Questionnaire data were obtained from the adolescent participants regarding the initiation, continuation, frequency and amount of smoking.

Smoking: Initiation

The total number of male and female participants who had ever tried (including "just a puff") and never tried cigarette smoking is presented in Table 18. The difference between the number of males and females who had tried or never tried cigarette smoking was not statistically significant ($X^2 [1] = 3.119$, $p = 0.08$). A one sample Chi square test between the total number of participants who tried smoking and those who never tried smoking was also not statistically significant ($X^2 [1] = .105$, $p = .75$).

Table 18 Cigarette Smoking By Participants: Ever (Even just a Puff)

	Males n (%)	Females n (%)	Total n (%)
Yes, tried smoking	9 (34.6%)	18 (58.1%)	27 (47.4%)
No, never tried smoking	17 (65.4%)	13 (41.9%)	30 (52.6%)
Total	26 (100%)	31 (100%)	57 (100%)

The mean age at which participants tried smoking and smoked their first cigarette (even just a puff) was 11.85 years. The mean age at when male participants first tried smoking was 11.67 ($SD = 2.68$) and for female participants was 11.94 ($SD = 1.26$). The difference between males and females and the mean age at which they first tried smoking was not statistically significant ($t [26] = -0.39, p = 0.701$). The majority of participants who had tried smoking were aged between 11 to 13 when they first tried smoking (range for males = age 5 - 14, range for females = age 9 - 14). One male participant indicated that he had tried smoking at age five.

Smoking: Continuation

The total number of male and female participants who tried smoking and who then continued (even occasionally) or discontinued smoking is presented in Table 19. The difference between the proportion of males and females in relation to continuing to smoke was not statistically significant ($p = 0.68$).

Table 19 Continuation of Smoking of Participants, By Gender

	Males n (%)	Females n (%)	Total n (%)
Yes continued	3 (33.3%)	9 (50.0%)	12 (44.4%)
No did not continue	6 (66.7%)	9 (50.0%)	15 (55.6%)
Total	9 (100%)	18 (100%)	27 (100%)

Combining the data from Tables 18 and 19 it can be noted that 52.6% of the total sample never smoked (hereafter referred to as the “non-smokers”), 26.3% tried but did not continue to smoke (hereafter referred to as the “tried but quit”), and 21.1% tried and continued smoking (hereafter referred to as the “smokers”). Figure 2 summarizes these findings.

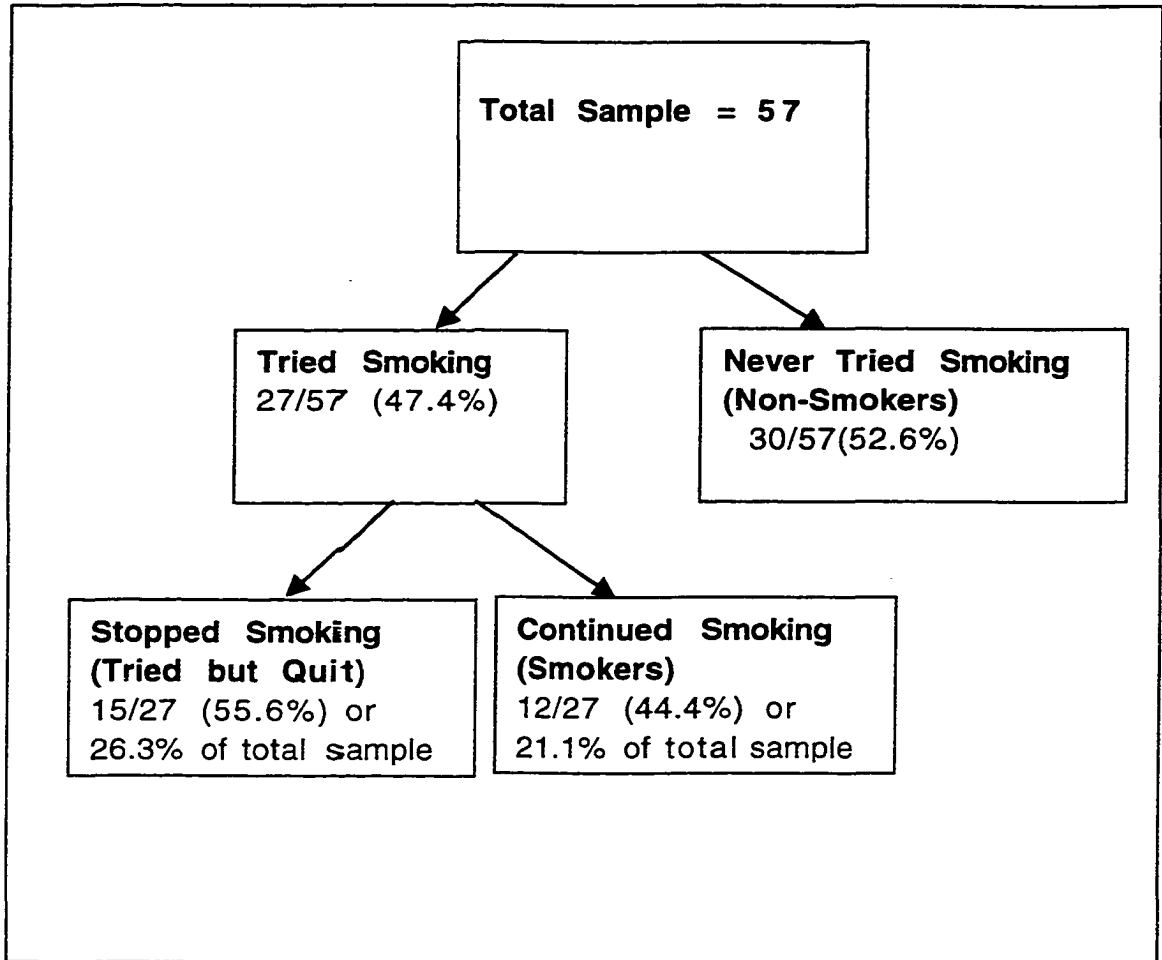


Figure 2. Participant's History of Smoking.

Smoking: Frequency and Amounts

Table 20 and Table 21 present data regarding the number of days and the number of cigarettes smoked per day by participant smokers.

Table 20 Number of Days in the Last Month Participant Smokers Smoked One or More Cigarettes

	Total n (%)
None (smokers but did not smoke in past month)	2 (3.6%)
1-5 days	4 (7.1%)
6-10 days	1(1.8%)
11-20 days	0 (--)
21-29 days	1 (1.8%)
30 days (every day)	3 (5.3%)
Total	11*

* One female participant who continued to smoke did not complete this question.

Table 21 Number of Cigarettes Smoked Per Day in the Last Month by Participant Smokers

	Total n (%)
Did not smoke in last 30 days	2 (3.6%)
5 or less per day	7 (12.5%)
6-10 per day	0 (--)
11-15 per day	1(1.8%)
16-20 per day	1(1.8%)
Total	11*

* One female participant who continued to smoke did not complete this question.

The amount and frequency of smoking for the participant smokers during the past month is presented below:

- 2 participant smokers did not smoke during the last 30 days
- 4 participant smokers smoked 5 or less/day for 1-5 days
- 1 participant smokers smoked 5 or less/day for 6-10 days
- 1 participant smokers smoked 5 or less/day for 21-29 days
- 1 participant smoker smoked 5 or less/day every day of the month
- 1 participant smoker smoked 11-15/day every day of the month
- 1 participant smoker smoked 16-20/day every day of the month

Summary of Questionnaire Smoking Findings

The self-reported frequency of the CVRF of smoking in this sample of adolescents can be summarized as follows:

1. 52.6% of the participants never smoked (non-smokers), whereas 47.4% of participants had tried smoking. 26.3% of the participants who tried smoking then quit (tried but quit), and 44.4% of the participants who tried smoking continued to smoke (smokers) (this represents 21.1% of the total sample).
 - 1.1 The difference between the total number of participants who tried smoking and those who never tried smoking was not statistically significant.
 - 1.2 The difference between the proportion of male and female participants who tried smoking but quit and those who never tried smoking was not statistically significant.
 - 1.3 The difference between the number of males and females in relation to continuing to smoke was not statistically significant.

- 1.4 The difference between the number of participants who tried and continued smoking versus tried and discontinued was not statistically significant.
- 2.0 The mean age at which participants' first tried smoking was 11.85 years.
 - 2.1 The youngest reported age of smoking initiation was 5 and the oldest was 14.
 - 2.2 The difference between male and female participants and the mean age at which they first tried smoking was not statistically significant.
- 3.0 The number of days (frequency) and the number of cigarettes smoked (amount) by participant smokers varied extensively.
 - 3.1 The lowest smoking frequency and amount reported was no cigarettes during the past month.
 - 3.2 The greatest smoking frequency and amount reported was 16-20 cigarettes per day, every day of the month.

Physical Activity/Inactivity

Physical activity/inactivity data were obtained in relation to physical activities participants engaged in and the number of hours per week spent watching TV, VCR movies and playing computer games. In addition, overall physical activity ratings and level of sports enjoyment ratings were also obtained.

Physical Activity

The number of times per week that male and female participants engaged in 15 minutes or more of physical activity is presented in Table 22.

Table 22 Times per Week Participants Engaged in Physical Activity*, By Gender

	Males n (%)	Females n (%)	Total n (%)
Not at All	0 (--)	0 (--)	0 (--)
Once/Week	1 (3.9%)	2 (6.4%)	3 (5.3%)
2-3 x/Week	7 (26.9%)	10 (32.3%)	17 (29.8%)
4-6 x/Week	7 (26.9%)	7 (22.6%)	14 (24.6%)
Daily	11 (42.3%)	12 (38.7%)	23 (40.3%)
Total	26 (100%)	31 (100%)	57 (100%)

* Activities were to be at least 15 minutes duration.

Using the data provided in Table 22 participants were grouped into the following three categories according to their exercise frequency: 1) inactive participants - participants who reported exercising not at all or once/week (5.3%, n = 3), 2) moderately active participants - participants who reported exercising 2-3 times/week (29.8%, n = 17), and 3) very active participants - participants who reported exercising 4-6 times/week or daily (64.9%, n = 37). The exercise frequency categories (not at all, once a week, 2-3 times per week, 4-6 times per week, and daily) were then treated as a five point Likert scale and the mean exercise frequency scores for male and female participants were calculated and compared using an independent t-test. The difference between the exercise frequency mean scores of male and female participants was not statistically significant (male mean scores = 4.08 with a SD of .935, female mean scores = 3.94 with a SD of .998, $t [55] = 0.55, p = 0.59$).

The physical activities male and female participants report engaging in during the past 6 months are presented in Table 23. A means score t-test was done comparing the mean number of different physical activities males and females participated in during the past 6 months. The difference between the mean scores of the number of different physical activities engaged in by male and female participants was not statistically significant (male mean scores = 10.77 with a SD of 5.31, female mean scores = 9.77 with a SD of 4.16, $t [47] = 0.78$, $p = 0.44$).

When each of the physical activities presented in Table 23 were considered separately, and gender differences evaluated using Fisher's Exact Tests, nonsignificant differences were found to exist for all activities except golf ($p = .005$), hockey ($p = .001$), soccer ($p = .026$) and in walking ($p = .00001$). The proportion of males who reported engaging in golf, hockey and soccer was greater than the proportion of females. The proportion of females who reported engaging in walking was greater than the proportion of males.

Table 23 Physical Activities Engaged in by Participants During the Past 6 Months, By Gender

	Males n (%)	Females n (%)	Total n (%)
Aerobics	7 (26.9%)	15 (48.4%)	22 (38.6%)
Baseball	10 (38.5%)	5 (16.1%)	15 (26.3%)
Basketball	19 (73.1%)	21 (67.7%)	40 (70.2%)
Bicycling	20 (76.9%)	19 (61.3%)	39 (68.4%)
Football	14 (53.9%)	8 (25.8%)	22 (38.6%)
Golf	15 (57.7%)	6 (19.4%)	21 (36.8%)
Gymnastics	2 (7.7%)	6 (19.4%)	8 (14.0%)
Jogging	18 (69.2%)	23 (74.2%)	41 (71.9%)
Hiking	15 (57.7%)	18 (58.%)	33 (57.9%)
Hockey	10 (38.5%)	1 (3.2%)	11 (19.3%)
Horse Riding	4 (15.4%)	9 (29.0%)	13 (22.8%)
Sailing/boating	6 (23.1%)	3 (9.68%)	9 (15.8%)
Skating	11 (42.3%)	13 (41.9%)	24 (42.1%)
Skiing	13 (50.0%)	12 (38.7%)	25 (43.9%)
Soccer	14 (53.9%)	7 (22.6%)	21 (36.8%)
Roller Blading	14 (53.9%)	12 (38.7%)	26 (45.6%)
Swimming	17 (65.4%)	26 (83.9%)	43 (75.4%)
Track & Field	13 (50.0%)	13 (41.9%)	26 (45.6%)
Tennis/Racket Sports	12 (46.2%)	11 (35.5%)	23 (40.4%)
Volleyball	17 (65.4%)	25 (80.6%)	42 (73.7%)
Walking	3 (11.5%)	22 (71.0%)	25 (43.9%)
Weight Training	9 (34.6%)	17 (54.8%)	26 (45.6%)
Snow-boarding	7 (26.9%)	6 (19.4%)	13 (22.8%)
Other	11 (42.3%)	5 (16.1%)	16 (23.1%)
Total	26 (100%)	31 (100%)	57 (100%)

Table 24 presents the level of sports enjoyment ratings by male and female participants. The enjoyment ratings (a lot = 1, a bit = 2, not much = 3, not at all = 4) were treated as a four point Likert scale and mean rating scores for male and female participants were calculated and an independent t-test was computed. The difference between levels of sports enjoyment reported by male and female participants was not statistically significant (male mean scores = 1.54 with a SD of .368, female mean scores = 1.43 with a SD of .679, $t [54] = -1.87$, $p = 0.067$).

Table 24 Participants' Level Of Sports Enjoyment Rating, By Gender

	Males n (%)	Females n (%)	Total n (%)
A Lot	22(84.6%)	20 (66.7%)	42 (75.0%)
A Bit	4 (15.4%)	7 (23.3%)	11 (19.6%)
Not Much	0 (--)	3 (10.0%)	3 (5.4%)
Not At All	0 (--)	0 (--)	0 (--)
Total	26(100%)	30*(100%)	56*(100%)

* One female participant did not complete this question.

Table 25 presents the level of sports enjoyment ratings by participants physical activity status. Because of the small sample of inactive participants, comparison between the three physical activity groups was not possible, but comparison between the moderately active and the very active participants was computed. The difference between levels of sports enjoyment reported by moderately active and very active participants was statistically significant (moderately active participants' enjoyment mean scores = 1.6 with a SD of .72, very active participants' enjoyment mean scores = 1.2 with a SD of .9, $t [51] = 2.87$, $p = 0.0059$).

Table 25 Participants' Level Of Sports Enjoyment Rating, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)
A Lot	2 (66.7%)	8 (50.0%)	32 (86.5%)
A Bit	1 (33.3%)	6 (37.5%)	4 (10.8%)
Not Much	0 (--)	2 (12.5%)	1 (2.7%)
Not At All	0 (--)	0 (--)	0 (--)
Total	3 (100%)	16* (100%)	37 (100%)

* One female participant did not complete this question.

Physical Inactivity

The number of hours/week male and female participants spent watching TV, VCR movies, and playing computer games are presented in Tables 26, 27, and 28. Because of small cell sizes Chi squares could not be computed, therefore independent t-tests were done. The differences between male and female participants in relation to the number of hours they watched TV, (male mean scores = 4.27 with SD of 1.54, female mean scores = 3.84 with SD of 3.84, t [55] = 1.26, p =0.21) or watched videos (male mean scores = 3.04 with SD of .82, female mean scores = 2.87 with SD of 1.17, t [54] = 0.63, p =0.53) was not statistically significant, however, the hours per week males and females spent playing computer games was statistically significant (male mean scores = 2.73 with SD of 1.15, female mean scores = 1.87 with SD of .776, t [54] = 3.33, p =0.0016). In other words, males were more likely to spend time playing computer games than females.

Table 26 Number of Hours Per Week Participants Watched TV, By Gender

	Males n (%)	Females n (%)	Total n (%)
Not at all	1 (3.9%)	0 (--)	1 (1.7%)
Less than 1 hour	4 (15.4%)	1 (3.2%)	5 (8.8%)
1-3 hours	3 (11.5%)	13 (41.9%)	16 (28.1%)
4-6 hours	3 ((11.5%)	10 (32.3%)	13 (22.8%)
7-9 hours	9 (34.6%)	4 (12.9%)	13 (22.8%)
10 + hours	6 (23.1%)	3 (9.7%)	9 (15.8%)
Total	26 (100%)	31 (100%)	57 (100%)

Table 27 Number of Hours Per Week Participants Watched VCR Movies, By Gender

	Males n (%)	Females n (%)	Total n (%)
Not at all	1 (3.9%)	3 (10%)	4 (7.1%)
Less than 1 hour	4 (15.4%)	7 (23.3%)	11 (19.6%)
1-3 hours	15 (57.6%)	15 (50%)	30 (53.6%)
4-6 hours	5 (19.2%)	3 (10%)	8 (14.3%)
7-9 hours	1 (3.9%)	0 (--)	1 (1.8%)
10 + hours	0 (--)	2 (6.7%)	2 (3.6%)
Total	26 (100%)	30* (100%)	56* (100%)

Table 28 Number of Hours Per Week Participants Played Computer Games, By Gender

	Males n (%)	Females n (%)	Total n (%)
Not at all	5 (19.2%)	10 (33.4%)	15 (26.8%)
Less than 1 hour	5 (19.2%)	15 (50.0%)	20 (35.7%)
1-3 hours	6 (23.1%)	4 (13.3%)	10 (17.9%)
4-6 hours	6 (23.1%)	1 (3.3%)	7 (12.5%)
7-9 hours	1 (3.9%)	0 (--)	1 (1.8%)
10 + hours	3 (11.5%)	0 (--)	3 (5.3%)
Total	26 (100%)	30*	56*

* One female participant did not answer this question.

The number of hours/week participants spent watching TV, VCR movies, and playing computer games were also identified by physical activity status, and are presented in Tables 29, 20 and 31. Because of small cell sizes Chi squares could not be computed. Minimum and maximum numbers of hours for each activity are included in the summary. Moderately active and very active participants reported playing more hours of computer games than did inactive participants. Only in the very active category were there participants that played 10 or more hours per week of computer games.

Table 29 Number of Hours Per Week Participants Watched TV, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)
Not at all	0 (--)	0 (--)	1 (2.7%)
Less than 1 hour	1 (33.3%)	0 (--)	4 (10.8%)
1-3 hours	0 (--)	3 (17.7%)	13 (35.1%)
4-6 hours	2 (66.7%)	5 (29.4%)	6 (16.2%)
7-9 hours	0 (--)	5 (29.4%)	8 (21.6%)
10 + hours	0 (--)	4 (23.5%)	5 (13.5%)
Total	3 (100%)	17 (100%)	37 (100%)

Table 30 Number of Hours Per Week Participants Watched VCR Movies, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)
Not at all	0 (--)	1 (5.9%)	3 (8.3%)
Less than 1 hour	1 (33.3%)	3 (17.7%)	7 (19.4%)
1-3 hours	2 (66.7%)	9 (52.9%)	19 (52.8%)
4-6 hours	0 (--)	1 (5.9%)	7 (19.4%)
7-9 hours	0 (--)	1 (5.9%)	0 (--)
10 + hours	0 (--)	2 (11.8%)	0 (--)
Total	3 (100%)	17 (100%)	36 (100%)*

* One participant did not answer this question.

Table 31 Number of Hours Per Week Participants Played Computer Games, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)
Not at all	2 (66.7%)	3 (17.7%)	10 (27.8%)
Less than 1 hour	1 (33.3%)	7 (41.2%)	12 (33.3%)
1-3 hours	0 (--)	3 (17.7%)	7 (19.4%)
4-6 hours	0 (--)	3 (17.7%)	4 (11.1%)
7-9 hours	0 (--)	1 (5.9%)	0 (--)
10 + hours	0 (--)	0 (--)	3 (8.3%)
Total	3 (100%)	17 (100%)	36 (100%)*

* One participant did not answer this question.

Table 32 presents male and female participants rating of their overall physical activity using a five-point Likert scale (low = 1 to five = high). The mean rating scores for male and female participants were calculated and a t-test was computed. The mean overall physical activity scores were 4.35 for males and 3.61 for females with a standard deviation of .846 and .803 respectively. The difference between the overall physical activity ratings reported by male and female participants was statistically significant ($t [55] = 3.35, p = 0.0015$). In other words, males were more likely to rate their overall physical activity higher than were females.

Table 32 Overall Physical Activity Rating of Participants, By Gender

	Males n (%)	Females n (%)	Total n (%)
1(Low)	0 (--)	1(3.2%)	1(1.8%)
2	0 (--)	1(3.2%)	1(1.8%)
3	6 (23.1%)	9(29.0%)	15 (26.3%)
4	5 (19.2%)	18(58.1%)	23 (40.3%)
5(High)	15 (57.7%)	2(6.5%)	17 (29.8%)
Total	26 (100%)	31(100%)	57 (100%)

Table 33 presents the overall physical activity ratings of participants by physical activity status. Mean overall physical activity ratings were calculated for each group and are as follows: inactive participant mean score = 3.3 (SD = .57), moderately active participant mean score = 3.4 (SD = .86), and very active participant mean score = 4.3 (SD = .77). Comparison of the means across all three physical activity status was not possible because of the small n in the inactive category. A t-test calculated between the moderately active and the very active participants overall physical activity rating mean scores was statistically significant ($t [52] = -3.92$ $p = 0.0003$). In other words, very active participants rated their overall physical activity higher than did participants who were moderately active.

Table 33 Overall Physical Activity Rating of Participants, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)
1(Low)	0 (--)	1 (5.8%)	0 (--)
2	0 (--)	0 (--)	1 (2.7%)
3	2 (66.7%)	9 (52.9%)	4 (19.8%)
4	1 (33.3%)	6 (35.3%)	16 (43.2%)
5(High)	0 (--)	1 (5.9%)	16 (43.2%)
Total	3 (100%)	17 (100%)	37 (100%)

Summary of Questionnaire Physical Activity/Inactivity Findings

The self-reported frequency of the CVRF of physical activity/inactivity in this sample of adolescents can be summarized as follows:

1. 5.3% of participants reported exercising “not at all” or “once/week” (inactive), 29.8% reported exercising 2-3 times/week (moderately active), and 64.9% reported exercising 4-6 times per week or daily (very active).
 - 1.1 The difference between the mean exercise frequency scores of male and female participants was not statistically significant.
 - 1.2 The difference between the mean scores of the number of different physical activities engaged in by male and female participants was not statistically significant.
 - 1.3 The difference between the proportion of male participants versus female participants who reported participating in golf, soccer, and hockey was statistically significant, with more males than

females engaging in those activities. The reverse was true for walking, where a statistically significant difference was noted with more females reported the activity than males. Gender differences were not observed for other sports activities.

- 1.4 The difference between male and female participants in rating their sports enjoyment was not statistically significant.
 - 1.5 The difference between levels of sports enjoyment reported by moderately active and very active participants was statistically significant, with very active participants reporting enjoying sports more than moderately active participants.
2. The reported number of hours/week spent watching TV, VCR movies, and playing computer games was as follows:
- 2.1 Hours/week watching TV:
 - The difference between male and female participants and the number of hours per week of television they watched was not statistically significant.
 - The minimum number of hours/week spent watching TV reported by *inactive*, *moderately active*, and *very active* participants was “less than one hour”, “1-3 hours/week”, and “not at all” respectively.
 - The maximum number of hours/week spent watching TV reported by *inactive*, *moderately active*, and *very active* participants was “4-6 hours/week”, “10+ hours/week”, and “10+ hours/week” respectively.
 - 2.2 Hours/week watching VCR movies:
 - The difference between the mean number of hours per week of

VCR movies watched by male and female participants was not statistically significant.

- The minimum number of hours/week spent watching VCR movies reported by *inactive*, *moderately active*, and *very active* participants was “less than one hour”, “not at all”, and “not at all” respectively.

- The maximum number of hours/week spent watching TV reported by *inactive*, *moderately active*, and *very active* participants was “1-3 hours/week”, “10+ hours/week”, and “4-6 hours/week” respectively.

2.3 Hours/week playing computer games:

-The difference between the mean number of hours/week spent playing computer games by male and female participants was statistically significant, with male participants spending more time playing computer games than female participants.

- The minimum number of hours/week spent playing computer games reported by *inactive*, *moderately active*, and *very active* participants was “not at all”, “not at all”, and “not at all” respectively.

- The maximum number of hours/week spent playing computer games reported by *inactive*, *moderately active*, and *very active* participants was “less than 1 hour”, “7-9 hours/week”, and “10+ hours/week” respectively.

3. Participants' ratings of their overall physical activity levels using a 5 point Likert scale (1 = low, 5 = high) were as follows:

3.1 The difference between male and female participants and their

overall physical activity ratings was statistically significant, with males more likely to rate their overall physical activity higher than females.

- 3.2 Mean overall physical activity ratings by participants according to their physical activity status was 3.3, 3.4 and 4.3 for inactive, moderately active, and very active participants, respectively. The difference between the moderately active and the very active participants' overall physical activity rating was statistically significant, with active participants rating their overall physical activity higher than participants who were moderately active.

Smoking x Physical Activity

Table 34 categorizes participants according to their self-reported smoking behavior and physical activity levels.

Table 34 Participant Smoking Status x Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)	Total n (%)
Non-Smokers	3 (5.3%)	8 (14.0%)	19 (33.3%)	30 (52.6%)
Tried but quit	0 (--)	8 (14.0%)	7 (12.3%)	15 (26.3%)
Smokers	0 (--)	1 (1.8%)	11 (19.3%)	12 (21.1%)
Total	3 (100%)	17 (100%)	37 (100%)	57 (100%)

Participants in the different smoking subgroups (those who had tried smoking but quit, and those who continued to smoke) reported participating in similar physical activities such as those listed in Table 23.

Summary of the Questionnaire Smoking x Physical Activity Findings

The self-reported frequency of the CVRF of smoking and physical activity/inactivity in this sample of adolescents can be summarized as follows:

1. 5.3% of participants were *inactive non-smokers*; 14.0% of the participants were *moderately active non-smokers*; 33.3% of participants were *very active non-smokers*; no participants were *inactive tried smoking but quit smokers*, 14.0% of the participants were *moderately active tried but quit smokers*; 12.3% of the participants were *very active tried but quit smokers*; no participants were *inactive smokers*, 1.8% of the participants were *moderately active smokers*; and 19.3% of the participants were *very active smokers*.

Research Question #2: What knowledge do adolescents have regarding the cardiovascular risk factors of smoking and physical inactivity?

Knowledge regarding CVRF of Smoking

Data were gathered regarding participants' knowledge of smoking related health problems. Participants were presented with a list of health problems and asked to check off health problems they thought could be caused by smoking. Table 35 presents the number of participants categorized by smoking status who identified health problems caused by smoking. As noted all participants believed that smoking caused lung cancer. Six participants identified other problems were caused by smoking. These included: shortness of breath, tumors, depression and symptoms of nausea, addiction, mouth cancer and dizziness.

Each of the specific health problems presented in Table 35 were considered separately and a contingency table analysis was completed using Chi Square to detect significant difference among participants' smoking status groups and their endorsement or non-endorsement of the health problem. There was a statistically significant difference among non-smoking participants, tried but quit and smoking participants in identifying lung disease as a health problem caused by smoking ($X^2 [2] = 8.214, p = .016$). Post hoc comparisons using Fisher's exact tests were completed. A statistically significant difference in identifying lung disease as a health problem caused by smoking was observed between the non-smokers and the smokers ($p = .019$). The difference between non-smokers and participants who had tried smoking but quit, and between participants who had tried smoking but quit and smokers was not statistically significant ($p = .33, p = .29$ respectively). In other words,

compared to non-smokers, adolescents who smoked were less likely to identify lung disease as a health problem caused by smoking.

Table 35 Number of Participants By Smoking Status Who Identified Specific Health Problems Caused by Smoking

Health Problems	Non-Smokers n (%)	Tried but Quit n (%)	Smokers n (%)	Total n (%)
No health problems caused	0 (--)	0 (--)	0 (--)	0 (--)
Lung Cancer	30 (100%)	15 (100%)	12 (100%)	57 (100%)
Other Cancer	22 (73.3%)	7 (46.7%)	8 (66.7%)	37 (64.9%)
Diabetes	2 (6.7%)	3 (20.0%)	3 (25.0%)	8 (14.0%)
Heart Disease	27 (90.0%)	12 (80.0%)	8 (66.7%)	47 (82.5%)
Stroke	18 (60.0%)	10 (66.7%)	3 (25.0%)	31 (54.4%)
Arthritis	2 (6.7%)	4 (26.7%)	2 (16.7%)	8 (14.0%)
Lung Disease (Bronchitis, Asthma, Emphysema)	30 (100%)	14 (93.3%)	9 (75.0%)	53 (93.0%)
Low Birth Weight Babies	24 (80.0%)	13 (86.7%)	10 (83.3%)	47 (82.5%)
Less Energy/Strength	23 (76.7%)	12 (80.0%)	5 (41.7%)	40 (70.2%)
Other	3 (10.0%)	1 (6.7%)	2 (16.7%)	6 (10.5%)
Total	30 (100%)	15 (100%)	12 (100%)	57 (100%)

Each participant's smoking knowledge score was calculated by adding up the number of health problems that the participant endorsed on the list identified in Table 35. The maximum possible smoking knowledge score was 9. The mean smoking knowledge scores of participants categorized by smoking

status was 5.93 for non-smokers (range = 3 - 9, Mdn = 6.0, SD = 1.46), 6.0 for participants that tried smoking but quit (range = 3 - 9, Mdn = 6.0, SD = 1.97) and 5.0 for smokers (range = 1 - 9, Mdn = 5.0, SD = 2.63). Comparison of these mean smoking knowledge scores using analysis of variance (ANOVA) was not statistically significant ($t [2] = 1.22, p = .30$).

Mean smoking knowledge scores of participants categorized by gender were also calculated (male mean scores = 6.19 with SD of 2.08, female mean scores = 5.39 with SD of 1.67). Comparison of these mean smoking knowledge scores was not statistically significant ($t [47] = 1.62, p = 0.12$).

Summary of Questionnaire Smoking Knowledge Findings

The self-reported knowledge regarding the CVRF of smoking in this sample of adolescents can be summarized as follows:

1. Identification of specific health problems caused by smoking:
 - 1.1 All participants identified lung cancer as a health problem caused by smoking.
 - 1.2 The difference between the proportion of non-smokers, participants who tried smoking but quit, and smokers endorsing lung disease as a health problem caused by smoking was statistically significant. In other words, compared to the participants who were non-smokers, smokers were less likely to identify lung disease as a health problem caused by smoking.
 - 1.3 The difference between the proportion of non-smokers, participants who tried smoking but quit, and smokers endorsing lung cancer, other cancer, diabetes, heart disease, stroke, arthritis, low birth weight, less energy/strength as health problems caused by smoking was not statistically significant.

2. Smoking knowledge scores:
 - 2.1. The difference between the mean smoking knowledge scores of participants categorized by smoking status was not statistically significant.
 - 2.2. The difference between the mean smoking knowledge scores of male and female participants was not statistically significant.

Knowledge regarding CVRF of Physical Activity/Inactivity

Questionnaire data were obtained regarding participants' knowledge of health benefits related to physical activity. Participants were presented with a list of possible health benefits and asked to check off those they thought were physical activity benefits. The questionnaire did not include items regarding the effects of physical inactivity and therefore these can only be inferred from the participants' reported benefits of physical activity. Table 36 presents the number of participants categorized by physical activity status who identified specific physical activity benefits. The benefits of physical activity in preventing heart disease, lung disease and bone problems and reducing blood pressure were identified less often by participants. Four participants identified other benefits of physical activity. These included: muscular build/strength/fitness, good shape, good circulation and social health.

Each of the specific physical activity benefits presented in Table 36 were considered separately and a contingency table analysis was completed and evaluated using Chi Square to detect significant differences among participants' physical activity status groups and their endorsement or non-endorsement of the benefit. Statistically significant differences were observed among the groups for two physical activity benefits: preventing heart disease ($X^2 [2] = 8.622$, $p = .013$), and preventing bone problems ($X^2 [2] = 9.067$, $p = .011$). It

must be emphasized, however, that when calculating the Chi square values, they were not stable due to low cell sizes. Therefore the meaningfulness of the values is questionable. Post hoc comparisons using Fisher's exact test were calculated between the participants who were moderately active and very active and this difference was not statistically significant in relation to participants being able to identify "preventing heart disease" as a physical activity benefit ($p = .52$), but the difference was statistically significant in relation to participants being able to identify "prevention of bone problems" as a physical activity benefit ($p = .007$).

Table 36 Number of Participants By Physical Activity Status Who Identified Specific Physical Activity Benefits

Physical Activity Benefits	Inactive n (%)	Moderately Active n (%)	Very Active n (%)	Total n (%)
Increased mobility	3 (100.0%)	17 (100.0%)	34 (91.9%)	54 (94.7%)
Breathing	3 (100.0%)	17 (100.0%)	29 (78.4%)	49 (86.0%)
Prevents heart disease	0 (--)	14 (82.35%)	27 (73.0%)	41 (71.9%)
Feeling good	2 (66.7%)	16 (94.1%)	34 (91.9%)	52 (91.2%)
Relieves tension/anxiety	3 (100.0%)	15 (88.2%)	32 (86.5%)	50 (87.7%)
Prevents bone problems	1 (33.3%)	6 (35.3%)	28 (75.7%)	25 (43.9%)
Weight loss	2 (66.7%)	17 (100.0%)	28 (75.7%)	47 (82.5%)
Prevents lung disease	0 (--)	6 (35.3%)	14 (37.8%)	30 (52%)
Reduces blood pressure	2 (66.7%)	16 (94.1%)	26 (70.3%)	44 (77.2%)
Energy & strength	3 (100%)	16 (94.1%)	35 (94.6%)	54 (94.7%)
Other	0 (--)	2 (11.7%)	2 (5.4%)	4 (7.0%)
Total	3(100%)	17 (100%)	37 (100%)	57 (100%)

Each participant's physical activity benefit knowledge score was calculated by adding up the number of physical activity benefits that the participant endorsed on the list identified in Table 36. The maximum possible physical activity benefit knowledge score was 10. The mean physical activity benefit knowledge scores for participants categorized by physical activity status was 6.33 for inactive participants (range = 6 - 7, Mdn = 6.0, SD = .58), 8.2 for participants that were moderately active (range = 6 - 10, Mdn = 8.0, SD = 1.25) and 7.8 for very active participants (range = 1 - 10, Mdn 9.0, SD = 2.47). In comparing the participants' mean physical activity benefit knowledge scores by physical activity status it was decided not to include the inactive category because this category had only 3 participants, making comparisons inappropriate. The difference between physical activity benefit knowledge scores of participants who were moderately active and very active was not statistically significant ($t [52] = .67, p = .51$). The difference between mean physical activity benefit knowledge scores of male and female participants was also not statistically significant (male mean scores = 8.08 with SD of 2.15, female mean scores = 7.68 with SD of 2.14, $t [55] = .70, p = 0.49$).

Summary of Questionnaire Physical Activity Benefits Knowledge Findings

The self-reported knowledge regarding physical activity benefits in this sample of adolescents can be summarized as follows:

1. Identification of specific benefits associated with physical activity:
 - 1.1 The difference between the proportion of inactive, moderately active and very active participants endorsing prevention of heart disease as a benefit of physical activity was statistically

significant. Post hoc comparisons showed no statistical difference between moderately active and very active participants (there were no participants who identified prevention of heart disease as a benefit of physical activity).

- 1.2 The difference between the proportion of inactive, moderately active and very active participants endorsing prevention of bone problems as a benefit of physical activity was statistically significant. Post hoc comparisons showed that the statistical significant difference was between moderately active and very active participants, with more very active participants reporting “preventing bone problems” than participants who were moderately active.
- 1.3 The difference between the proportion of inactive, moderately active and very active participants endorsing increased mobility, improvement in breathing, feeling good, relieves tension/anxiety, weight loss, prevents lung disease, reduces blood pressure and energy and strength as benefits of physical activity were not statistically significant.

2. Physical activity benefits knowledge scores:

- 2.1 The difference between the mean physical activity benefit knowledge scores of participants categorized as moderately active or very active was not statistically significant.
- 2.2 The difference between the mean physical activity benefit knowledge scores of male and female participants was not statistically significant.

Smoking and Physical Activity Knowledge of Participants
categorized by Smoking Status x Physical Activity Status

Mean smoking knowledge scores were calculated for each participant categorized according to their smoking status and physical activity status. As previously noted the maximum possible smoking knowledge score was 9. Table 37 outlines the mean smoking knowledge scores for each group of participants categorized by their smoking status and activity status. As can be noted, smokers who were very active had the lowest mean smoking knowledge scores, while non-smokers who were very active had the highest mean smoking knowledge scores.

Table 37 Mean Smoking Knowledge Scores of Participants Categorized By Smoking Status and Physical Activity Status

	Inactive Mean (range)	Moderately Active Mean (range)	Very Active Mean (range)
Non-Smokers	5 (3 - 7)	5.5 (4 - 7)	6.26 (4 - 9)
Tried but quit	N/A	6.25 (3 - 9)	5.71 (2 - 9)
Smokers	N/A	6 (6)	4.91 (1 - 9)

Table 38 presents a summary of the mean physical activity benefit knowledge score for each participant categorized according to smoking status and physical activity status. As was previously noted, the maximum possible physical activity benefit knowledge score was 10. As can be noted, non-smokers who were inactive had the lowest mean physical activity benefit knowledge score, while very active non-smokers had the highest mean physical activity benefit knowledge scores.

Table 38 Mean Physical Activity Benefits Knowledge Scores of Participants Categorized By Smoking Status and Physical Activity Status

	Inactive Mean (range)	Moderately Active Mean (range)	Very Active Mean (range)
Non-Smokers	6.33 (6 - 7)	8 (6 - 10)	8.74 (5 - 10)
Tried but quit	N/A	8.63 (7 - 10)	7.57 (5 - 10)
Smokers	N/A	7 (7)	6.37 (1-10)

When comparing Tables 37 and 38 it can be noted that very active smokers had lower mean smoking knowledge and physical activity benefit knowledge scores than did either the very active participants that had tried smoking but quit and the very active non-smokers. Inactive non-smokers had low knowledge scores for both smoking effects and physical activity benefits.

Summary of Questionnaire Smoking and Physical Activity Benefits Knowledge Findings of Participants Categorized by Smoking and Physical Activity Status

The self-reported knowledge regarding health problems caused by smoking and benefits associated with physical activity categorized by smoking status and physical activity status can be summarized as follows:

1. Smoking knowledge scores:
 - 1.1 Smokers who were very active had the lowest mean smoking knowledge scores.
 - 1.2 Non-smokers who were very active had the highest mean smoking knowledge scores.

2. Benefits of physical activity knowledge scores:
 - 2.1 Non-smokers who were inactive had the lowest mean physical activity benefits knowledge scores.
 - 2.2 Non-smokers who were very active had the highest mean physical activity knowledge scores.

3. Smoking knowledge scores and physical activity benefits knowledge scores of very active participants categorized by smoking status:
 - 3.1 Very active smokers had lower mean smoking knowledge score and lower mean physical activity benefits knowledge score than did the very active participants who had tried smoking but quit and the very active non-smokers.
 - 3.2. Very active participants who tried smoking but quit smoking had lower mean smoking knowledge score and lower mean physical activity benefits knowledge score than did very active non-smokers.
 - 3.3. Very active participants who tried smoking but quit smoking had higher mean smoking knowledge score and higher mean physical activity benefits knowledge score than did very active smokers.
 - 3.4. Very active non-smokers had a higher mean smoking knowledge score and higher mean physical activity benefits knowledge score than did the very active participants who had tried smoking but quit and the very active smokers.

Correlation Between Individual Participants Smoking and Physical Activity Knowledge Scores

A Pearson product moment correlation coefficient (r) calculated for individual participants' smoking and physical activity benefits knowledge scores was 0.75 ($p = <.01$). In other words, there is a high correlation between smoking knowledge and physical activity benefits knowledge.

Research Question #3: What individuals and factors do adolescents think influence the CVRF of smoking and physical inactivity in themselves and other adolescents?

Factors Influencing Smoking

Questionnaire data were collected on the following six smoking influencing factors: 1) companion for first smoking experience, 2) companion for adolescents who continue to smoke, 3) the most important reason to continue smoking, 4) family members who smoke, 5) friends who smoke, and 6) family history of heart disease. Data on the first two factors were obtained from participants in the tried but quit and the smoking groups. Data on the remaining four factors were obtained from participants in all smoking status groups. Allowance and job status of participants were also calculated by smoking status groups.

Factors Influencing Smoking: Companion for First Smoking Experience

Table 39 presents the companion with whom participants (tried and quit and smokers) *first* tried smoking by smoking status. Because of many small cell numbers statistical testing is not appropriate and the data therefore can only be described. With the exception of two subjects, all participants who smoked (even if just a puff) had a companion for their first smoking experience. Over 80% of participants from both the tried smoking but quit group and the smoking group identified that they had their first smoking experience with friends.

Table 39 Participants' Companion for First Smoke Experience, By Smoking Status

	Tried But Quit* n (%)	Smokers n (%)	Total n (%)
By Myself	0 (--)	2 (16.7%)	2 (7.7%)
Friends	12 (85.7%)	10 (83.3%)	22 (84.6%)
Brother or Sister	1 (7.14%)	0 (--)	1 (3.9%)
Other (cousins)	1 (7.14%)	0 (--)	1 (3.8%)
Total	14 (100%)	12 (100%)	26* (100%)

* One male participant who smoked did not fill in the question.

Factors Influencing Smoking: Companion for Adolescents Who Continued to Smoke

Twelve of the 27 participants who tried smoking in this study continued to smoke. Of those participants who continued to smoke (smokers), 9.1% reported smoking by "myself", and 90.9% reported smoking with companions. Of those who smoked with a companion, 45.4% smoked with "friends", 9.1% smoked with a "brother or sister", and 36.4% smoked with "multiple" companions (more than one category, four of the smokers reported that they smoked by themselves, with friends, and/or with other family members). As with the first smoking experience the companion smoking participants most often reported smoking with was their friends.

Factors Influencing Smoking: The Most Important Reason to Continue Smoking

Participants who continued to smoke (smokers), were asked to identify the most important reason for them to keep smoking out of a list of six possible reasons. Table 40 presents the most important reason identified by

male and female smokers. As can be noted, under the “other” category two male smokers reported the following other reasons to smoke: “for the buzz”, and “It’s a pointless habit that is hard to break”. One of the female smokers wrote on the questionnaire: “ I have a nick fit. I’m addicted”. Four of the female smokers (50.0%) reported that the most important reason to continue to smoke was that it was relaxing. Due to small cell numbers statistical testing was not appropriate beyond describing the data.

Table 40 Smokers Most Important Reason to Continue Smoking*, By Gender

	Males n (%)	Females n (%)	Total n (%)
I enjoy it	0 (--)	0 (--)	0 (--)
It makes me feel grown up	0 (--)	1 (12.5%)	1 (9.1%)
It helps me stay slim	0 (--)	0 (--)	0 (--)
It is relaxing	0 (--)	4 (50.0%)	4 (36.3%)
My friends smoke	1 (33.3%)	1 (12.5%)	2 (18.2%)
I feel the urge	0 (--)	2 (25.0%)	2 (18.2%)
Other	2 (66.7%)	0 (--)	2 (18.2%)
Total	3 (100%)	8** (100%)	11** (100%)

* Based on only those participants who continued to smoke.

** One female participant who smoked did not complete this question.

Factors Influencing Smoking: Family Members who Smoke

The particular family members who smoke in the homes of participants’ categorized according to participant smoking status are outlined in Table 41. Two categories in which there were adequate numbers allowing for statistical comparison included: “no one” and “father and mother” (father and mother were combined). Although 50% of participants stated no one smoked in their

home, the difference between the proportion of participants in each smoking status groups and the “no one smokes” category was not statistically significant ($X^2 [2] = 5.626, p = .06$). The difference between the proportion of participants in each smoking status group and the category of “father and mother” (father and mother were combined) were also not statistically significant ($X^2 [2] = 2.841, p = .24$). In other words, there was no difference between non-smokers, those who tried smoking but quit and smokers in relation to having no one in the home who smoked or in having their mother and father smoke.

A contingency table analysis was also completed using Fisher’s exact tests to detect significant difference among male and female participants and specific family members that smoked in the home. No statistically significant difference was noted in any of the categories by gender. No specific comparisons between male and female participants and smoking status were possible because of low cell sizes.

Table 41 Family Members Who Smoke in Homes of Participants, Categorized, By Smoking Status

	Non-Smokers* n (%)	Tried But Quit n (%)	Smokers** n (%)	Total* n (%)
No one	16 (57.1%)	9 (60%)	2 (18.2%)	27(50.0%)
Father	6 (21.4%)	4 (26.7%)	4 (36.4%)	14(25.9%)
Mother	6 (21.4%)	4 (26.7%)	4 (36.4%)	14(25.9%)
Brother	1 (3.6%)	1 (6.7%)	4 (36.4%)	6(11.1%)
Sister	1 (3.6%)	2 (13.3%)	2 (18.2%)	5(9.3%)
Other Relative	3 (10.7%)	4 (26.7%)	3 (27.3%)	10(18.5%)
Any Others	2 (7.1%)	1 (6.7%)	11 (100%)	3(5.6%)
Total	28 (100%)	15 (100%)	11 (100%)	54 (100%)

* Two Non-Smokers did not complete this question.

**One smoker did not complete this question.

The mean number of smokers in the homes of participants who were non-smokers was .536 (Mdn = 0.0, SD = .88), participants who tried smoking but quit was .457 (Mdn = 0.0, SD = .743) and for smokers was 1.75 (Mdn = .20, SD = 1.215). These results indicate that there were more smokers in the homes of adolescents who smoked.

An ANOVA comparing the mean number of smokers in the participants' home according to participants' smoking status was statistically significant ($F [2] = 8.35, p = .001$). Post hoc analysis using Student-Newman-Keuls was computed which reviewed that there was no statistical difference between non-smokers and participants who had tried smoking but quit. Contrasts comparing non-smokers and smokers and participants who had tried smoking but quit and smokers were both statistically significant ($t [52] = -3.785, p = <.001$, and $t [52] = -3.564, p = .001$). In other words, non-smokers and those who tried but quit had significantly fewer individuals smoking in the home than did smokers, but non-smokers and individuals who tried but quit had similar mean number of smokers in the home.

The data were also described by gender in relation to the mean number of smokers in the homes of participants. The male mean = 1.78, SD = 1.09, while the female mean = 1.80, SD = .68). There was no statistically significant difference between the number of smokers in the homes of male and female participants who smoked ($p = 0.96$).

Factors Influencing Smoking - Friends who Smoke

On average each participant reported having 9 close friends (mean = 8.98, SD = 7.35). One student did not specify a number but stated "lots". The number of close friends who smoke based on participant smoking status are presented in Table 42. Over 50% of participants reported that none of

their friends smoked. There was no statistically significant difference between smoking status and the categories of “none” ($X^2 [2] = 4.25, p=.12$) and “some” ($X^2 [2] = 1.373, p =.50$). No other categories were compared because of low cell numbers.

Table 42 Close Friends who Smoke, By Participant Smoking Status

	Non-Smokers n (%)	Tried but Quit n (%)	Smokers n (%)	Total n (%)
None	18 (60.0%)	8 (53.3%)	3 (25.0%)	29 (50.9%)
Some (<half)	12 (40.0%)	7 (46.7%)	3 (25.0%)	22 (38.6%)
Most (>than half)	0 (--)	0 (--)	5 (41.7%)	5 (8.8%)
All Smoke	0 (--)	0 (--)	1 (8.3%)	1 (1.7%)
Total	30 (100%)	15 (100%)	12 (100%)	57 (100%)

Factors Influencing Smoking: Family History of Heart Disease and Smoking Status

The number of participants, according to smoking status, who reported a family history of smoking and heart disease is indicated in Table 43. It is important to note that overall, approximately one third of the participants in each of the smoking groups did not know whether or not there was a history of heart disease in their families. One male indicated that his father had a history of heart disease and was now deceased. It was unclear whether or not the father died from heart disease. This student had never smoked, not even a puff. No statistical testing was appropriate because approximately one third of participants did not know whether or not there was a family history of heart disease and because of a number of small cell sizes.

Table 43 Participant Smoking Status and Family History of Heart Disease

	Non-Smokers n (%)	Tried but Quit n (%)	Smokers n (%)
HD Hx**: Yes	11 (36.7%)	5 (33.3%)	5 (41.7%)
HD Hx: No	10 (33.3%)	5 (33.3%)	3 (25.0%)
HD Hx: Don't know	9 (30.0%)	5 (33.3%)	4 (33.3%)
Total	30 (100%)	15 (100%)	12 (100%)

* HD = Heart Disease

** Hx = History

Smoking: Relationship of Descriptive Data

Twenty-one non-smokers (70.0%), nine who tried smoking but quit (60.0%) and seven smokers (58.3%) received an allowance. In the overall sample, 23 of 57 participants had jobs (11 non-smokers [36.7%], five who tried smoking but quit [33.3%], and seven smokers [58.3%]). One male who smoked reporting working 40 hours/week. The differences between smoking status and receiving an allowance and having a job was not statistically significant ($X^2 [2] = .728, p = .69, X^2 [2] = 2.088, p = .35$ respectively).

Summary of Questionnaire Findings related to Factors Influencing Smoking

The self-reported smoking influencing factors in this sample of adolescents can be summarized as follows:

1. Companion for *first* smoking experience:
 - 1.1 With the exception of two subjects, all participants who smoked (even if just a puff) had a companion for their first smoking experience.

- 1.2 Over 80% of participants from both the tried smoking but quit and the smokers groups reported having their first smoking experience with friends.
2. Companion for adolescents who continued to smoke:
 - 2.1 9.1% of the participant smokers reported smoking by themselves, and 90.9% reported smoking with companions.
 - 2.2 The companion participant smokers most often reported smoking with was friends.
3. Most important reason to continue smoking:
 - 3.1 50% of female smokers reported that the most important reason to continue smoking was that "it was relaxing". 25.0% reported that "I feel the urge", 12.5% "I feel the urge", 12.5% "my friends smoke", and 12.5% "it makes me feel grown up".
 - 3.2 Two of the three male smokers who continued to smoke reported that they did so "for the buzz" and "It's a pointless habit that is hard to break". The other reported he smoked because his friends smoked.
4. Family Members who Smoke:
 - 4.1 Specific individuals who smoke in the home:
 - 4.1.1 57.1% of non-smokers, 60% of participants who tried but quit smoking, and 18.2% of smokers reported that no one smoked in their home.
 - 4.1.2 Of those participants who did have family members in the home who smoked, mothers and fathers were the most

frequently identified smokers.

4.1.3 The difference between participant smoking status groups and the category of “no one smoked” was not statistically significant.

4.1.4. The difference between participant smoking status groups and the combined categories of “father and mother” was not statistically significant.

4.1.5 The difference between male and female participants and specific individuals who were smokers in the home was not statistically significant.

4.2 Mean Number of smokers in the home:

4.2.1 The difference comparing the mean number of smokers in the homes of participants by participant smoking status was statistically significant.

- The difference between the mean number of smokers in the homes of participants who were non-smokers and of those who were smokers was statistically significant.
- The difference between the mean number of smokers in the homes of participants who tried smoking but quit and of those who were smokers was statistically significant.
- The difference between the mean number of smokers in the homes of participants who were non-smokers and of those who tried smoking but quit was not statistically significant.
- Non-smokers and those participants who had tried

smoking but quit had significantly fewer individuals smoking in the home than did smokers.

4.2.2 The difference between the mean number of male and female participants and the number of smokers in the home was not statistically significant.

5. Friends who smoke:

5.1 More non-smokers and those who tried smoking but quit than smokers had no friends who smoked.

5.2 41.7% of smokers reported "most" of their friends smoked.

5.3 The difference between participants' smoking status in the categories of close friends who smoke: "none" and "some" were not statistically significant.

6. Family history of heart disease and smoking status:

6.1 30% of non-smokers, 33.3% of participants who tried smoking but quit, and 33.3% of smokers did not know whether or not there was a family history of heart disease.

7. The relationship between participant smoking status and demographic variables of allowance and job status were as follows:

7.1 70% of non-smokers, 60.0% of participants who tried smoking but quit, and 58.3% of smokers received an allowance. The difference between smoking status and receiving an allowance was not statistically significant.

7.2 36.7% of non-smokers, 33.3% of those who tried smoking but

quit, and 58.3% of smokers had jobs. The difference between smoking status and having a job was not statistically significant.

Factors Influencing Physical Activity/Inactivity

Questionnaire data regarding physical activity/inactivity influences were collected on the following five influencing factors: 1) reasons to like and participate, 2) reasons not to participate, 3) encouragement by family, friends, and others, 4) activity level of family, friends and others, and 5) family history of heart disease.

Factors Influencing Physical Activity/Inactivity: Reasons to Participate

Participants were provided with a list of 11 reasons for liking and participating in physical activities, and were asked to indicate an importance rating (not important, fairly important, important, and very important) for each reason. The reasons inactive, moderately active and very active participants reported for liking and participating in physical activities and their associated ratings are outlined in Tables 44, 45 and 46. Statistical testing was not appropriate because of small numbers in a variety of cells and therefore the data are only described.

Reasons to participate in physical activities were also calculated based on male and female responses and these are presented in Tables 47 and 48. A statistically significant difference was noted between male and female participants and identification of looking good as a reason for physical activity participation ($X^2 [3] = 8.736, p = .03$). In other words, females were more likely to indicate that looking good was very important than were males. One other

category in which a statistically significant difference was noted was in relation to “getting into good shape” ($X^2 [3] = 9.468, p = .02$). This finding is questionable and cannot be accurately interpreted because more than 20% of cell sizes were less than five.

Table 44 Reason for Physical Activity Participation by *Inactive* Participants

	Not Important n (%)	Fairly Important n (%)	Important n (%)	Very Important n (%)
To have fun	0 (--)	0 (--)	1 (33.3%)	2 (66.7%)
Be good at activity	2 (66.7%)	0 (--)	0 (--)	1 (33.3%)
To win	0 (--)	3 (100%)	0 (--)	0 (--)
To see friends	0 (--)	0 (--)	0 (--)	3 (100%)
To improve my health	0 (--)	0 (--)	1 (33.3%)	2 (66.7%)
To get in good shape	0 (--)	0 (--)	2 (66.7%)	1 (33.3%)
To look good	0 (--)	1 (33.3%)	1 (33.3%)	1 (33.3%)
To meet new friends	0 (--)	1 (33.3%)	1 (33.3%)	1 (33.3%)
To enjoy the feeling of using my body	1 (33.3%)	0 (--)	2 (66.7%)	0 (--)
To be like a sports star	3 (100%)	0 (--)	0 (--)	0 (--)
To please my parents	3 (100%)	0 (--)	0 (--)	0 (--)

Table 45 Reason for Physical Activity Participation by Moderately Active Participants

	Not Important n (%)	Fairly Important n (%)	Important n (%)	Very Important n (%)
To have fun	0 (--)	2 (11.8%)	9 (52.9%)	6 (35.3%)
Be good at activity	2 (11.8%)	2 (11.8%)	11 (64.7%)	2 (11.8%)
To win	7 (41.2%)	7 (41.2%)	2 (11.8%)	1 (5.9%)
To see friends	2 (11.8%)	5 (29.4%)	8 (47.1%)	2 (11.8%)
To improve my health	1 (5.9%)	5 (29.4%)	6 (35.3%)	5 (29.4%)
To get in good shape	1 (5.9%)	3 (17.7%)	6 (35.3%)	7 (41.2%)
To look good	2 (11.8%)	5 (29.4%)	6 (35.3%)	4 (23.5%)
To meet new friends	2 (11.8%)	7 (41.2%)	6 (35.3%)	2 (11.8%)
To enjoy the feeling of using my body	3 (17.7%)	7 (41.2%)	5 (29.4%)	2 (11.8%)
To be like a sports star	10 (58.2%)	3 (17.7%)	3 (17.7%)	1 (5.9%)
To please my parents	9 (52.4%)	5 (29.4%)	2 (11.8%)	1 (5.9%)

Table 46 Reason for Physical Activity Participation by Very Active Participants

	Not Important n (%)	Fairly Important n (%)	Important n (%)	Very Important n (%)
To have fun	0 (--)	0 (--)	12 (32.4%)	25 (67.6%)
Be good at activity	2 (5.4%)	6 (16.2%)	14 (37.8%)	8 (21.6%)
To win*	11 (30.6%)	10 (27.7%)	5 (13.9%)	10 (27.7%)
To see friends	1 (2.7%)	7 (18.9%)	17 (45.9%)	12 (32.4%)
To improve my health	0 (--)	1 (2.7%)	13 (35.1%)	23 (62.2%)
To get in good shape	0 (--)	1 (2.7%)	7 (18.9%)	29 (78.4%)
To look good	5 (13.5%)	8 (21.6%)	9 (24.3%)	15 (40.5%)
To meet new friends	1 (2.7%)	10 (27.0%)	13 (35.1%)	13 (35.1%)
To enjoy the feeling of using my body*	2 (5.6%)	4 (11.1%)	16 (44.4%)	14 (38.9%)
To be like a sports star	24 (64.9%)	5 (13.5%)	2 (5.4%)	6 (16.2%)
To please my parents	25 (67.6%)	3 (8.1%)	4 (10.8%)	5 (13.5%)

* One participant did not complete this question

Table 47 Reason for Male Participants' Physical Activity Participation

	Not Important n (%)	Fairly Important n (%)	Important n (%)	Very Important n (%)
To have fun	0 (--)	1 (3.9%)	9 (34.6%)	16 (61.5%)
Be good at activity	2 (7.7%)	3 (11.5%)	9 (34.6%)	12 (46.2%)
To win	6 (23.1%)	8 (30.8%)	5 (19.2%)	7 (26.9%)
To see friends	0 (--)	5 (19.2%)	12 (46.2%)	9 (34.6%)
To improve my health	0 (--)	5 (19.2%)	11 (42.3%)	10 (38.5%)
To get in good shape	0 (--)	3 (11.5%)	11 (42.3%)	12 (46.2%)
To look good	6 (23.1%)	6 (23.1%)	9 (34.6%)	5 (19.2%)
To meet new friends	2 (7.7%)	5 (19.2%)	12 (46.2%)	7 (26.9)
To enjoy the feeling of using my body	4 (15.4%)	5 (19.2%)	9 (34.6%)	8 (30.8%)
To be like a sports star	13 (50.0%)	5 (19.2%)	4 (15.4%)	4 (15.4%)
To please my parents	13 (50.0%)	5 (19.2%)	4 (15.4%)	4 (15.4%)

Table 48 Reason for Female Participants' Physical Activity Participation

	Not Important n (%)	Fairly Important n (%)	Important n (%)	Very Important n (%)
To have fun	0 (--)	1 (3.2%)	13 (41.9%)	17 (54.8%)
Be good at activity	2 (7.7%)	3 (11.5%)	9 (34.6%)	12 (46.2%)
To win	12 (40.0%)	12 (40.0%)	2 (6.7%)	4 (13.3%)
To see friends	3 (9.7%)	7 (22.6%)	13 (41.9%)	8 (25.8%)
To improve my health	1 (3.2%)	1 (3.2%)	9 (29.0%)	20 (64.5%)
To get in good shape	1 (3.2%)	1 (3.2%)	4 (12.9%)	25 (80.7%)
To look good	1 (3.2%)	8 (25.8%)	7 (22.6%)	15 (48.4%)
To meet new friends	1 (3.2%)	13 (41.9%)	8 (25.8%)	9 (29.0%)
To enjoy the feeling of using my body	2 (6.7%)	6 (20.0%)	14 (46.7%)	8 (26.7%)
To be like a sports star	24 (77.4%)	3 (9.7%)	1 (3.2%)	3 (9.7%)
To please my parents	24 (77.4%)	3 (9.7%)	2 (6.5%)	2 (6.5%)

Mean scores were calculated for each of the reasons to be physically active and these were categorized by smoking and physical activity status groups. Table 49 presents the means for each of the reasons.

Table 49 Mean Scores Related to Reasons to be Physically Active Categorized By Smoking x Physical Activity Status Groups

	Non/Inact	Non/Mod	Non/Act	TBQ/Mod	TBQ/Act	Smok/Mod	Smok/Act
To have fun	3.67	3.38	3.79	3	3.43	4	3.64
Be good at activity	3.67	2.88	3.26	2.88	3.29	1	3.18
To win	2	2	2.53	1.63	2.29	2	2.2
To see friends	4	2.38	3.32	2.75	2.43	3	3.1
To improve my health	4	3	3.63	2.75	3.63	4	3.55
To get in good shape	3.33	3.13	3.79	3	3.71	4	3.73
To look good	3	2.38	2.84	2.88	2.71	4	3.18
To meet new friends	3	2.5	2.95	2.5	2.43	2	3.55
To enjoy the feeling of using my body	2.33	2.38	3.16	2.13	3.14	4	3.2
To be like a sports star	1.0	1.75	1.74	1.75	2	1	1.55
To please my parents	1	1.75	1.95	1.75	1.43	1	1.46

Non/Inact = Non-smoker, Inactive

Non/Mod = Non-smoker, Moderately Active

Non/Act = Non-smokers, Active

TBQ/Mod = Tried but Quit, Moderately Active

TBQ/Act = Tried but Quit, Active

Smok/Mod = Smoker, Moderately Active

Smok/Act = Smoker, Active

1 = Not Important

2 = Fairly Important

3 = Important

4 = Very Important

Factors Influencing Physical Activity/Inactivity: Reasons not to Participate

Participants were presented with a list of six possible reasons for not being active (health reasons, lack of time, others laugh at me, lack of motivation, I don't like to work out where other people can see me, lack of energy) and were asked to select the most important reason why they would not participate in physical activities. Forty-six (80.6%) of participants did not respond to this item on the questionnaire. Table 50 presents the reasons why participants were not physically active in terms of physical activity status. Table 51 presents the reasons why participants were not physically active by gender. The top two reasons for not being physically active were lack of time and motivation. One female student cited asthma as a health reason for not being active.

Table 50 Reasons Why Participants are Not Physically Active

	Inactive n (%)	Moderately Active n (%)	Very Active n (%)
Not Checked Off	1 (33.3%)	11 (64.7%)	34 (91.9%)
Health Reasons	0 (--)	1 (5.9%)	0 (--)
Lack of Time	2 (66.7%)	2 (11.76%)	2 (5.4%)
Lack of Motivation	0 (--)	2 (11.8%)	1 (2.7%)
Lack of Energy	0 (--)	1 (5.9%)	0 (--)
Total	3 (100%)	17 (100%)	37 (100%)

Table 51 Reasons Why Participants are Not Physically Active

	Males n (%)	Females n (%)	Total n (%)
Not Checked Off	24 (92.2%)	22 (71.0%)	46(80.7%)
Health Reasons	0 (--)	1(3.2%)	1 (1.8%)
Lack of Time	1 (3.9%)	5 (16.1%)	6 (10.5%)
Lack of Motivation	1 (3.9%)	2 (6.5%)	3 (5.2%)
Lack of Energy	0 (--)	1 (3.2%)	1(1.8%)
Total	26 (100%)	31 (100%)	57 (100%)

Factors Influencing Physical Activity/Inactivity: Encouragement by Family, Friends and Home Room Teacher

Tables 52, 53, and 54 present data regarding specific individuals who encouraged participants to participate in sports according to physical activity status of the participants (inactive, moderately active and very active). No statistical testing was possible because of numerous small cell numbers. Mothers and best friends were most *often* the individuals to encourage inactive participants to engage in physical activities. Mothers, brothers, and best friends were most *often* the individuals to encourage moderately active participants to engage in physical activities. Best friends were most *often* the individuals to encourage active participants to engage in physical activities.

Table 52 Individuals who Encourage *Inactive* Participants to Participate In Sports

	Often n (%)	Sometimes n (%)	Never n (%)	Don't Know n (%)	Don't Have n (%)	Total n (%)
Mother	2 (66.7%)	1 (33.3%)	0 (--)	0 (--)	0 (--)	3 (100%)
Father	0 (--)	1 (33.3%)	2 (66.7%)	0 (--)	0 (--)	3 (100%)
Brother	0 (--)	2 (66.7%)	1 (33.3%)	0 (--)	0 (--)	3 (100%)
Sister	0 (--)	0 (--)	2 (66.7%)	0 (--)	1 (33.3%)	3 (100%)
Best friend	2 (66.7%)	0 (--)	1 (33.3%)	0 (--)	0 (--)	3 (100%)
Teacher	1 (33.3%)	1 (33.3%)	1 (33.3%)	0 (--)	0 (--)	3 (100%)

Table 53 Individuals who Encourage *Moderately Active* Participants to Participate In Sports

	Often n (%)	Sometimes n (%)	Never n (%)	Don't Know n (%)	Don't Have n (%)	Total n (%)
Mother	6 (35.3%)	5 (29.4%)	4 (23.5%)	2 (11.8%)	0 (--)	17 (100%)
Father	3 (17.7%)	9 (52.4%)	5 (29.4%)	0 (--)	0 (--)	17 (100%)
Brother	5 (35.7%)	3 (21.4%)	4 (28.6%)	0 (--)	2 (14.3%)	14 (100%)*
Sister	2 (12.5%)	3 (18.6%)	5 (31.3%)	0 (--)	5 (37.5%)	16 (100%)**
Best friend	6 (35.3%)	6 (35.3%)	4 (23.5%)	1 (5.88%)	0 (--)	17 (100%)
Teacher	1 (6.3%)	9 (56.3%)	5 (31.3%)	1 (6.3%)	0 (--)	17 (100%)***

* Three participants did not complete this question.

** One participant did not complete this question.

*** One participant did not complete this question.

Table 54 Individuals who Encourage Very Active Participants to Participate In Sports

	Often n (%)	Sometimes n (%)	Never n (%)	Don't Know n (%)	Don't Have n (%)	Total n (%)
Mother	21 (56.8%)	13 (35.1%)	2 (5.4%)	1 (2.7%)	0 (--)	37 (100%)
Father	19 (51.4%)	12 (32.4%)	3 (8.1%)	1 (2.7%)	2 (5.4%)	37 (100%)
Brother	5 (13.8%)	8 (22.2%)	7 (19.4%)	1 (2.7%)	15 (41.6%)	36 (100%)*
Sister	5 (15.2%)	7 (21.2%)	5 (15.2%)	0 (--)	16 (48.5%)	33 (100%)**
Best friend	22 (59.5%)	8 (21.6%)	5 (13.5%)	2 (5.4%)	0 (--)	37 (100%)
Teacher	13 (35.1%)	16 (43.2%)	7 (18.9%)	1 (2.7%)	0 (--)	37(100%)

* One participant did not complete this question.

** Two participants did not complete this question.

Tables 55 and 56 present individuals who encouraged boys and girls to participate in physical activities. Male participants identified their best friend as the person who “often” encouraged them to participate in physical activities (73.1%, n =19). One male student whose father had died wrote that his father always encouraged him, “(He was the) best coach I ever had”.

The girls’ responses to who encouraged them to participate in sports were varied. A Fisher’s exact test was done on the category of best friends encouraging them. The difference between males and females best friend encouraging them “often” to participate was statistically significant ($p = .007$). When taking into account the categories of “often”, “sometimes” and “never” a statistically significant difference was still identified between “best friend” and males and females ($X^2 [2] = 8.053, p = .018$). In other words, boys were encouraged more by their best friend to participate in physical activities than were girls. Overall, boys were encouraged more often to participate in sports than females but no statistically significant difference was identified in the

remaining categories, although the category of "father's" encouragement of males and females was close to being statistically significant ($X^2 [2] = 5.699, p = .058$).

Table 55 Individuals who Encourage Males to Participate In Sports

	Often n (%)	Sometimes n (%)	Never n (%)	Don't Know n (%)	Don't Have n (%)	Total n (%)
Mother	14 (53.9%)	12 (46.1%)	0 (--)	0 (--)	0 (--)	26 (100%)
Father	14 (53.9%)	9 (34.6%)	2 (7.7%)	0 (--)	1 (3.8%)	26 (100%)
Brother	7 (28.0%)	6 (24.0%)	3 (12.0%)	0 (--)	9 (36.0%)	25* (100%)
Sister	4 (19.1%)	3 (14.2%)	4 (19.1%)	0 (--)	10 (47.6%)	21** (100%)
Best friend	19 (73.1%)	4 (15.4%)	2 (7.7%)	1 (3.8)	0 (--)	26 (100%)
Teacher	5 (20.0%)	12 (48.0%)	6 (24.0%)	2(8.0%)	0 (--)	25 ***(100%)

* One male participant did not answer this question.

** Five male participants did not answer this question.

***One male participant did not answer this question.

Table 56 Individuals who Encourage Females to Participate In Sports

	Often n (%)	Sometimes n (%)	Never n (%)	Don't Know n (%)	Don't Have n (%)	Total n (%)
Mother	13 (41.9%)	8 (25.8%)	7 (22.6%)	3 (9.7%)	0 (--)	31 (100%)
Father	8 (25.8%)	13 (41.9%)	8 (25.8%)	1 (3.2%)	1 (3.2%)	31 (100%)
Brother	3 (10.7%)	7 (25.0%)	9 (32.1%)	1 (3.6%)	8 (28.6%)	28*
Sister	3 (9.7%)	7 (22.6%)	8 (25.8%)	0 (--)	13 (41.9%)	31 (100%)
Best friend	11 (35.5%)	10 (32.3%)	8 (25.8%)	2 (6.4%)	0 (--)	31 (100%)
Teacher	10 (32.3%)	14 (45.1%)	7 (22.6%)	0 (--)	0 (--)	31 (100%)

* Three female participants did not answer this question.

Factors Influencing Physical Activity/Inactivity: Activity Level of Family, Friends and Others

Tables 57, 58, and 59 present data for the participants' ratings of physical activity levels of family, friends and other individuals based on participants' physical activity status. No statistical testing was possible when comparing all of the categories because of numerous small cell numbers.

Tables 60 and 61 present data for the distribution of how male and female participants rated the activity levels of family and other individuals. Chi square tests were done for each category and no statistically significant differences were noted in any of these categories when all of the categories (every week, occasionally, not at all) were used. Best friend's of 84.6% of males was active every week, while only 54.8% of females reported that their best friend was active every week. When comparing the level of physical activity of best friends using a Fisher's exact test who worked out at least every week, a statistically significant difference was noted ($p = .02$).

Table 57 Level of Physical Activity of Individuals Associated with Inactive Participants

	Every Week n (%)	Occasionally n (%)	Not at All n (%)	Don't Know n (%)	Don't Have such a person n (%)	Total n (%)
Mother	0 (--)	1 (33.3%)	2 (66.7%)	0 (--)	0 (--)	3 (100%)
Father	0 (--)	3 (100%)	0 (--)	0 (--)	0 (--)	3 (100%)
Brother	2 (66.7%)	1 (33.3%)	0 (--)	0 (--)	0 (--)	3 (100%)
Sister	0 (--)	1 (33.3%)	1 (33.3%)	0 (--)	1 (33.3%)	3 (100%)
Best friend	2 (66.7%)	1 (33.3%)	0 (--)	0 (--)	0 (--)	3 (100%)
Teacher	0 (--)	1 (33.3%)	0 (--)	2 (66.7%)	0 (--)	3 (100%)

Table 58 Level of Physical Activity of Individuals Associated with Moderately Active Participants

	Every Week n (%)	Occasionally n (%)	Not at All n (%)	Don't Know n (%)	Don't Have such a person n (%)	Total n (%)
Mother	4 (23.5%)	8 (47.1%)	4 (23.5%)	1 (5.9%)	0 (--)	17 (100%)
Father	5 (29.4%)	10 (58.8%)	1 (5.9%)	1 (5.9%)	0 (--)	17 (100%)
Brother	7 (50.0%)	4 (28.6%)	1 (7.1%)	0 (--)	2 (14.3%)	14 (100%)*
Sister	3 (20.0%)	5 (33.3%)	1 (7.7%)	0 (--)	6 (40.0%)	15 (100%)**
Best friend	10 (58.8%)	6 (35.3%)	1 (5.8%)	0 (--)	0 (--)	17 (100%)
Teacher	1 (6.7%)	5 (33.3%)	3 (20.0%)	6 (40.0%)	0 (--)	15 (100%)***

* Three participants did not complete this question.

** Two participants did not complete this question.

*** Two participants did not complete this question.

Table 59 Level of Physical Activity of Individuals Associated with Very Active Participants

	Every Week n (%)	Occasionally n (%)	Not at All n (%)	Don't Know n (%)	Don't Have such a person n (%)	Total n (%)
Mother	13 (35.1%)	13 (35.1%)	9 (24.3%)	2 (5.4%)	0 (--)	37 (100%)
Father	15 (40.5%)	14 (37.8%)	4 (10.8%)	2 (5.4%)	2 (5.4%)	37 (100%)
Brother	12 (33.3%)	6 (16.7%)	3 (8.3%)	0 (--)	15 (41.7%)	36 (100%)*
Sister	8 (24.2%)	5 (15.2%)	4 (12.1%)	0 (--)	16 (48.5%)	33 (100%)**
Best friend	27 (73.0%)	7 (18.9%)	0 (--)	3 (8.1%)	0 (--)	37(100%)
Teacher	6 (16.2%)	9 (24.3%)	4 (10.8%)	18 (48.6%)	0 (--)	37 (100%)

* One participant did not complete this question.

** Four participants did not complete this question.

Table 60 Level of Physical Activity of Individuals Associated with Male Participants

	Every Week n (%)	Occasionally n (%)	Not at All n (%)	Don't Know n (%)	Don't Have such a person n (%)	Total n (%)
Mother	7 (26.9%)	8 (30.8%)	9 (34.6%)	2 (7.7%)	0 (--)	26 (100%)
Father	9 (34.6%)	13 (50.0%)	2 (7.7%)	1 (3.9%)	1 (3.9%)	26 (100%)
Brother	9 (36.0%)	4 (16.0%)	3 (12.0%)	9 (36.0%)	0 (--)	25*
Sister	6 (28.6%)	3 (14.3%)	2 (9.5%)	0 (--)	10 (43.3%)	21**
Best friend	22 (84.6%)	2 (7.7%)	1 (3.9%)	1 (3.9%)	0 (--)	26 (100%)
Teacher	2 (8.0%)	8 (32.0%)	4 (16.0%)	11 (44.0%)	0 (--)	25***

* One male participant did not complete this question.

** Five male participants did not complete this question.

*** One male participant did not complete this question.

Table 61 Level of Physical Activity of Individuals Associated with Female Participants

	Every Week n (%)	Occasionally n (%)	Not at All n (%)	Don't Know n (%)	Don't Have such a person n (%)	Total n (%)
Mother	10 (32.3%)	14 (45.2%)	6 (19.4%)	1 (3.2%)	0 (--)	31 (100%)
Father	11 (35.5%)	14 (45.2%)	3 (9.7%)	2 (6.5%)	1 (3.2%)	31 (100%)
Brother	12 (42.9%)	7 (25.0%)	1 (3.6%)	0 (--)	8 (28.6%)	28 *
Sister	5 (16.7%)	8 (26.7%)	4 (13.3%)	0 (--)	13 (43.0%)	30 **
Best friend	17 (54.8%)	12 (38.7%)	0 (--)	2 (6.5%)	0 (--)	31 (100%)
Teacher	5 (16.7%)	7 (23.3%)	3 (10.0%)	15 (50.0%)	0 (--)	30 **

* Three participant females did not complete the question.

** One participant female did not complete the question.

Factors Influencing Physical Activity/Inactivity: Family History of Heart Disease

Family history of heart disease in relation to physical activity status is outlined in Table 62. No statistical testing was possible among the physical activity categories because of the low cell numbers in the inactive category.

Table 62 Participants Physical Activity Status and Family History of Heart Disease

	Inactive n (%)	Moderately Active n (%)	Very active n (%)
HD Hx**: Yes	0 (--)	7 (33.3%)	14 (37.3%)
HD Hx: No	1 (33.3%)	4 (23.5%)	13 (35.1)
HD Hx: Don't know	2 (66.7%)	6 (35.3%)	10 (27.0)
Total	3 (100%)	17 (100%)	27 (100%)

Summary of Questionnaire Findings related to Physical Activity/Inactivity Influences

The self-reported physical activity influences in this sample of adolescents can be summarized as follows:

1. The Most Important Reasons to Participate in Physical Activities:
 - 1.1 The most important reason for participants who were inactive non-smokers to participate in physical activities was to have fun or be good at activity.
 - 1.2 The most important reason for participants who were moderately active non-smokers, to participate in physical activities was to have fun.
 - 1.3 The most important reason for participants who were very active non-smokers to participate in physical activities was to have fun or to get in good shape.
 - 1.4 The most important reason for participants who were moderately active and had tried smoking but quit, to participate in physical activities was to be good at activity or to look good.
 - 1.5 The most important reason for participants who were very active and had tried smoking but quit, to participate in physical activities was to get in good shape.
 - 1.6 No comparison was done because there was only one moderately active smoker.
 - 1.7 The most important reason for participants who were very active smokers, to participate in physical activities was to have fun.
 - 1.8 The most important reasons for males to participate in physical activities were: to have fun, be good at activity, and to get in

good shape.

- 1.9 The most important reasons for females to participate were: to get in good shape, to improve health, and to have fun.
- 1.10 The difference between male and female participants and identification of looking good as a reason for physical activity participation was statistically significant (females rated looking good as being more important than did males).

2. Reasons Not to Participate:

- 2.1 The top two reasons for not being physically active were lack of time and lack of motivation.
- 2.2 The top two reasons for not being physically active calculated by physical activity status were lack of time and lack of motivation.

3. Encouragement by family, friends, and others:

- 3.1 Mothers and best friends were most *often* the individuals to encourage inactive participants; mothers, brothers, and best friends were most *often* the individuals to encourage moderately active participants; and best friends were most *often* the individuals to encourage active participants to engage in physical activities.
- 3.2 Females were most often encouraged to participate in physical activities by their mothers and males were most often encouraged to participate in physical activities by their best friend. The difference between male and female participants' best friend encouraging them to participate was statistically significant.

4. Activity level of family, friends, and others:

4.1 Best friends of participants (both males and females and by physical activity status) were identified as being the most active at least every week. The difference between male and female participants and the level of physical activity of their best friends who worked out at least every week was statistically significant.

4.3 34.6% of male and 19.4% of female participants, 66.7% of inactive participants, 23.5% of moderately active participants, and 24.3% of very active participants reported that their mothers were not active at all.

5. Family history of heart disease:

5.1 66.7% of inactive participants, 35.3% of moderately active participants, and 27.0% of very active participants did not know whether or not there was a family history of heart disease.

5.2 33.3% of moderately active participants and 37.8% of very active participants had a family history of heart disease.

Research Question #4: What are the views of adolescents regarding the influence of stress/anxiety on the CVRF of smoking and physical inactivity in themselves and other adolescents?

Stress/Anxiety

In this study stress/anxiety were examined from the perspective of the influence it has on the CVRF of smoking and physical inactivity in adolescents. As will be recalled, initially the term “anxiety” was used in the questionnaire items but this term was changed to “stress/anxiety”. It became apparent after pilot testing that the participants understood stress and anxiety to mean the same thing. Questionnaire data were obtained from the adolescent participants in relation to: the amount of stress/anxiety experienced by the participants per week; stressors; and responses to stress/anxiety.

Stress/Anxiety - Number of Times per Week Participants reported Feeling Stress/Anxiety

In order to understand what participants perceived as the influence of anxiety on the CVRF of smoking and physical inactivity it was important to gather some background information regarding how often participants felt stressed/anxious; what the stressors were; and how did participants behaviorally respond to those stressors.

Tables 63 and 64 present the number of times participants reported being stressed/anxious per week when categorized by smoking status and by physical activity status. None of the smokers indicated that they were never stressed/anxious during the week, or that they were stressed more than 7 times per week. The smokers either were stressed between 1-3 times per week, or 4-6 times per week. There was no statistically significant difference

between participants who were non-smokers, tried but quit and smokers in relation to the number of times they were stressed/anxious per week ($\chi^2 [4] = 3.188, p = .52$). No statistical testing was possible due to low cell sizes when comparing physical activity status and number of times stressed/anxious per week.

Table 63 Number of Times Participants Reported being Stressed/Anxious Per Week, By Smoking Status

	Non-Smokers n (%)	Tried but Quit n (%)	Smokers n (%)	Total n (%)
None	3 (10.0%)	3 (20.0%)	0 (--)	6 (10.5%)
1-3 x per Week	20 (66.7%)	8 (53.3%)	8 (66.7%)	36 (63.2%)
4-6 x per Week	6 (20.0%)	3 (20.0%)	4 (33.3%)	13 (22.8%)
>7 per Week	1 (3.3%)	1 (6.7%)	0 (--)	2 (3.5%)
Total	30 (100%)	15 (100%)	12 (100%)	57 (100%)

Table 64 Number of Times Participants Reported being Stressed/Anxious Per Week, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very active n (%)
None	0 (--)	2 (11.8%)	4 (10.8%)
1-3 x per Week	1 (33.3%)	10 (58.8%)	25 (67.6%)
4-6 x per Week	1 (33.3%)	4 (23.5%)	8 (21.6%)
>7 per Week	1 (33.3%)	1 (5.9%)	0 (--)
Total	3 (100%)	17 (100%)	37 (100%)

Table 65 presents the number of times that males and females experienced stress/anxiety per week. Because of low cell sizes in the categories "4-6 x per week" and "greater than 7 times per week", these

categories were collapsed together. A Chi square on the categories of “none”, “1-3 x per week” and the collapsed category of “4-6 x per week and greater than 7 x per week” was significant ($X^2 [2] = 7.687, p = .02$). In other words, females indicated that they experienced more stress/anxiety per week than did males. Caution must be used in interpreting these results because even with collapsing of the cells there were still two categories out of six (33.3% of cells) that had cell numbers less than five.

Table 65 Number of Times Participants Reported being Stressed/Anxious Per Week, By Gender

	Males n (%)	Females n (%)	Total n (%)
None	5 (19.2%)	1 (3.2%)	6 (10.5%)
1-3 x per Week	18 (69.2%)	18 (58.1%)	36 (63.2%)
4-6 x per Week	3 (11.5%)	10 (32.3%)	13 (22.8%)
>7 per Week	0 (--)	2 (6.5%)	2 (3.5%)
Total	26 (100%)	31 (100%)	57 (100%)

Stress/Anxiety - Stressors

Table 66 and 67 present the stressors reported by participants based on participant smoking status and physical activity status respectively. Each of the stressors were evaluated using Chi square testing. No statistically significant differences related to stressors were noted among the groups.

Table 66 Participant Stressors, By Smoking Status

	Non-Smokers n (%)	Tried but Quit n (%)	Smokers n (%)	Total n (%)
Homework	27 (90%)	10 (66.7%)	9 (75.0%)	46 (80.7%)
Teachers	12 (40.0%)	8 (53.3%)	9 (75.0%)	29 (50.9%)
Classmates	10 (33.3%)	6 (40.0%)	5 (41.7%)	21 (36.8%)
Brothers & Sisters	12 (40.0%)	8 (53.3%)	5 (41.7%)	25 (43.9%)
Friends	8 (26.7%)	2 (13.3%)	3 (25.0%)	13 (22.8%)
Parents	17 (56.7%)	6 (40.0%)	7 (58.3%)	30 (52.6%)
Exams	24 (80.0%)	14 (93.3%)	9 (75.0%)	47 (82.5%)
Other	3 (10.0%)	2 (13.3%)	3 (25.0%)	8 (14.0%)
Total	30 (100%)	15 (100%)	12 (100%)	57 (100%)

Table 67 Participant Stressors, By Physical Activity Status

	Inactive n (%)	Moderately Active n (%)	Very active n (%)	Total n (%)
Homework	3 (100.0%)	15 (88.2%)	28 (75.7%)	46 (80.7%)
Teachers	0 (--)	11 (64.7%)	18 (48.6%)	29 (50.9%)
Classmates	0 (--)	6 (35.3%)	15 (40.5%)	21 (36.4%)
Brothers & Sisters	1 (33.3%)	10 (58.8%)	14 (37.8%)	25 (43.9%)
Friends	1 (33.3%)	2 (11.8%)	10 (27.0%)	13 (22.8%)
Parents	2 (66.7%)	11 (64.71%)	17 (45.9%)	30 (52.6%)
Exams	3 (100.0%)	16 (94.3%)	28 (75.7%)	47 (82.5%)
Other	1 (33.3%)	1 (5.9%)	6 (16.2%)	8 (14.0%)
Total	3 (100.0%)	17 (100.0%)	37 (100.0%)	57 (100%)

Male and female participants both indicated that exams and homework caused the most stress/anxiety. Data were collected during December in School #1 which coincided with a number of deadlines for exams and papers. Therefore, initially comparisons between the stressors of homework and exams were computed separately for the two schools. There was no statistically significant difference between School # 1 and School # 2 in relation to stress/anxiety caused by homework and exams (exams $p = .15$; homework $p = 1.0$). In light of the fact that there were no differences between School # 1 and School # 2, the data were combined. Table 68 presents data regarding stressors identified by male and female participants. In comparing male and female stressors two categories came close to being statistically significant: friends ($p = .051$) and parents ($p = .065$).

Table 68 Participant Stressors, By Gender

	Males n (%)	Females n (%)	Total n (%)
Homework	22 (84.6%)	24 (77.4%)	46 (80.7%)
Teachers	11 (42.3%)	18 (58.1%)	29 (50.9%)
Classmates	7 (26.9%)	14 (45.2%)	21 (36.8%)
Brothers & Sisters	6 (23.1%)	19 (61.3%)	25 (43.9%)
Friends	4 (15.4%)	9 (29.0%)	13 (22.8%)
Parents	10 (38.5%)	20 (64.5%)	30 (52.6%)
Exams	20 (76.9%)	27 (87.1%)	47 (82.5%)
Other	1 (3.9%)	7 (22.6%)	8 (14.0%)
Total	26 (100%)	31 (100%)	57 (100%)

Mean stressor scores were calculated by adding up the number of

stressors that each participant identified from the list identified in Table 68. The maximum possible number of stressors was 7. Mean stressor scores were calculated by participant smoking status group, physical activity status group, and smoking status group x physical activity status group. The mean stressor scores for non-smokers was 3.67 (range = 0 - 7, SD = 1.88), participants who had tried smoking but quit was 3.6 (range = 1 - 6 , SD = 1.55) and for smokers was 3.9 (range = 1 - 7, SD = 2.07). The mean stressor scores for inactive participants was 3.33 (range = 3 - 4, SD = .58), participants who were moderately active was 1.74 (range = 1 - 7 , SD = 1.74) and for smokers was 3.51 (range = 1 - 6, SD = 1.90).

Table 69 presents the mean stressor scored by smoking and physical activity status combined. An ANOVA calculated on the mean stressor scores by smoking status was not statistically significant ($f [2] = .11, p = .90$). Because of low numbers of inactive participants an ANOVA was not appropriate to be calculated on the three physical activity status levels. A t-test computed on the moderately active and the very activity categories was not statistically significant ($t [33] = 1.26, p = 0.22$). An ANOVA calculated on the mean stressor scores by smoking status and physical activity status was also not statistically significant ($f [5] = .48, p = .79$).

Table 69 Mean Stressor Scores, By Smoking Status x Physical Activity Levels

	Inactive Mean (SD Dev)	Moderately Active Mean (SD Dev)	Very active Mean (SD Dev)
Non-Smokers	3.33 (.58)	4.5 (1.93)	3.37 (1.95)
Tried but quit	0	3.75 (1.67)	3.43 (1.51)
Smokers	0	5.0	3.82 (2.14)

The top three stressors were identified by smoking status and physical activity status and are presented below. No statistical comparisons were possible due to small cell numbers in a variety of cells.

<u>Non-Smokers</u>	#1 Stressor:	Homework (36.7%) Exams (36.7%)
	#2 Stressor:	Brother/Sister (23.1%)
	#3 Stressor:	Teachers (20.0%) Classmates (20.0%)
<u>Tried But Quit</u>	#1 Stressor:	Exams (46.7%)
	#2 Stressor:	Homework (26.7%)
	#3 Stressor:	Classmates (20.0%) Brother/Sister (20.0%) Parents (20.0%)
<u>Smokers</u>	#1 Stressor:	Homework (50.0%)
	#2 Stressor:	Parents (33.3%) Exams (33.3%)
	#3 Stressor:	Teachers (25.0%)
<u>Non-Active</u>	#1 Stressor:	Homework (33.3%) Exams (33.3%) Brother/Sister (33.3%) Parents (33.3%) Other (33.3%)
<u>Moderately Active</u>	#1 Stressor:	Exams (40.5%)
	#2 Stressor:	Homework (27.0%)
	#3 Stressor:	Classmates (24.3%)
<u>Very Active</u>	#1 Stressor:	Exams (40.5%)
	#2 Stressor:	Homework (27.0%)
	#3 Stressor:	Classmates (24.3%)

Top stressors identified by males and females are indicated in Tables 70 and Table 71. A number of other stressors were indicated by the participants and include: "presentations and speeches", "piano", "doing better than good, 100%", "music", and "when my parents fight". One female indicated "me" as a

stressor and another female stated that “family problems, money problems, (and) loss of friends/family” caused her to be stressed/anxious.

Table 70 Top Stressors Identified By Male Participants

	Not Indicated n (%)	# 1 Stressor n (%)	# 2 Stressor n (%)	# 3 Stressor n (%)	Total n (%)
Homework	4 (15.4%)	12 (46.2%)	8 (30.8%)	2 (7.7%)	26 (100%)
Teacher	14 (53.9%)	0 (--)	6 (23.1%)	6 (23.1%)	26 (100%)
Classmates	18 (69.2%)	0 (--)	1 (3.9%)	7 (26.9%)	26 (100%)
Brothers or Sisters	22 (84.6%)	0 (--)	1 (3.9%)	3 (11.5%)	26 (100%)
Friends	23 (88.5%)	1 (3.9%)	2 (7.7%)	0 (--)	26 (100%)
Parents	20 (76.9%)	2 (7.7%)	2 (7.7%)	2 (7.7%)	26 (100%)
Exams	6 (23.1%)	9 (34.6%)	8 (30.8%)	3 (11.5%)	26 (100%)
Other	24 (92.3%)	1 (3.9%)	0 (--)	1 (3.9%)	26 (100%)

Table 71 Top Stressors Identified By Female Participants

	Not Indicated n (%)	# 1 Stressor n (%)	# 2 Stressor n (%)	# 3 Stressor n (%)	Total n (%)
Homework	8 (25.8%)	7 (22.6%)	8 (25.8%)	8 (25.8%)	31 (100%)
Teacher	20 (64.5%)	3 (9.7%)	2 (6.5%)	6 (19.4%)	31 (100%)
Classmates	24 (77.4%)	1 (3.2%)	3 (9.7%)	3 (9.7%)	31 (100%)
Brothers or Sisters	21 (67.7%)	3 (9.7%)	4 (12.9%)	3 (9.7%)	31 (100%)
Friends	26 (83.9%)	0 (--)	1 (3.2%)	4 (12.9%)	31 (100%)
Parents	16 (51.6%)	7 (22.6%)	6 (19.4%)	2 (6.5%)	31 (100%)
Exams	7 (22.6%)	12 (38.7%)	8 (25.8%)	4 (12.9%)	31 (100%)
Other	28 (90.3%)	1 (3.2%)	1 (3.2%)	1 (3.2%)	31 (100%)

Stress/Anxiety - Responses

Behavioral responses by participants to stress/anxiety were also categorized by smoking status and physical activity status, and these are presented in Tables 72 and 73. No meaningful statistical comparison between the responses of stress/anxiety by smoking status and physical activity status was possible because of low cell sizes in numerous categories.

Table 72 Participant Responses to Stress/Anxiety, By Smoking Status

	Non-Smokers Total n = 30 n (%)	Tried But Quit Total n = 15 n (%)	Smokers Total n = 12 n (%)
Listen to music	25 (83.3%)	13 (86.7%)	9 (75.0%)
Watch Television	22 (73.3%)	11 (73.3%)	5 (41.7%)
Talk to my best friend	16 (53.3%)	8 (53.3%)	6 (50.0%)
Work out	15 (50.0%)	4 (26.7%)	7 (58.3%)
Go for a walk	13 (43.3%)	5 (33.3%)	8 (66.7%)
Eat	12 (40.0%)	6 (40.0%)	6 (50.0%)
Yell or get angry	11 (36.7%)	4 (26.7%)	6 (50.0%)
Talk to my mother	10 (33.3%)	4 (26.7%)	2 (16.7%)
Talk to a brother or a sister	6 (20.0%)	4 (26.7%)	3 (25.0%)
Pray	7 (23.3%)	2 (13.3%)	3 (25.0%)
Fight with my parents	5 (16.7%)	3 (20.0%)	4 (33.3%)
Become aggressive (e.g., hitting someone/something)	7 (23.3%)	3 (20.0%)	2 (16.7%)
Talk to my father	16 (53.3%)	1 (6.7%)	1 (8.3%)
Drink alcohol	1 (3.3%)	0 (--)	3 (25.0%)
Break my curfew	1 (3.3%)	1 (6.7%)	2 (16.7%)
Other	4 (13.3%)	0 (--)	0 (--)
Smoke	0 (--)	0 (--)	3 (16.7%)
Talk to a teacher	2 (6.7%)	1 (6.7%)	0 (--)
Use drugs	0 (--)	0 (--)	1 (8.3%)
Talk to my guidance counsellor	0 (--)	0 (--)	1 (8.3%)

Table 73 Participant Responses to Stress/Anxiety, By Physical Activity Status

	Inactive Total n = 3 n (%)	Moderately Active Total n = 17 n (%)	Very active Total n = 37 n (%)
Listen to music	2 (66.7%)	16 (94.1%)	29 (78.4%)
Watch Television	1 (33.3%)	15 (88.2%)	22 (59.5%)
Talk to my best friend	1 (33.3%)	9 (52.9%)	20 (54.1%)
Work out	0 (--)	5 (29.4%)	21 (56.85)
Go for a walk	1 (33.3%)	9 (52.9%)	16 (43.2%)
Eat	1 (33.3%)	7 (41.2%)	16 (43.2%)
Yell or get angry	0 (--)	10 (58.8%)	11 (29.7%)
Talk to my mother	0 (--)	6 (35.3%)	10 (27.0%)
Talk to a brother or a sister	0 (--)	5 (29.4%)	8 (21.6%)
Pray	0 (--)	3 (17.65%)	9 (24.3%)
Fight with my parents	0 (--)	3 (17.7%)	9 (24.3%)
Become aggressive (e.g., hitting someone/something)	0 (--)	4 (23.5%)	8 (21.6%)
Talk to my father	0 (--)	2 (11.8%)	4 (10.8%)
Drink alcohol	0 (--)	1 (5.88%)	3 (8.1%)
Break my curfew	0 (--)	0 (--)	4 (10.8%)
Other	1 (33.3%)	1 (5.88%)	2 (5.4%)
Smoke	0 (--)	1 (5.88%)	2 (5.4%)
Talk to a teacher	0 (--)	1 (5.88%)	2 (5.4%)
Use drugs	0 (--)	0 (--)	1 (2.7%)
Talk to my guidance counsellor	0 (--)	0 (--)	1 (2.7%)

Behavioral responses by males and females to stress/anxiety was varied and are presented in Table 74. The most common responses were to listen to music and to watch TV. Other responses that were added by students were to swear (male), sleep (both male and female indicated), read books (male) or to cry (female). More females than males responded that they fight with their parents and this difference was statistically significant ($p = .047$). Two other categories in which there was close to being statistically significant results are: talking to their best friend ($p = .065$) and going for a walk ($p = .061$). No other statistically significant differences were noted.

Females in general appeared to more likely talk to someone than did males. In looking at the data it was decided to categorize the responses into the following groups: communication, potential solitary behaviors, aggressive/abusive behaviors and addictive behaviors. Communication included talking to best friend, mother, brother or sister, teacher, guidance counsellor, father or praying. Potential solitary behaviors included listening to music, watching television, working out, and going for a walk. Aggressive/abusive behaviors included yelling or getting angry, fighting with parents, becoming aggressive (e.g., hitting someone/something), and breaking curfew. Addictive behaviors included eating, drinking alcohol, smoking and using drugs. Mean scores were then calculated for each group comparing males versus females and independent t-tests were computed. The only category that showed a statistically significant difference was in relation to communication responses to stress/anxiety (male mean scores = .96, SD 1.37, female mean scores = 1.77, SD 1.26, $t [55] = -2.33$, $p = .023$).

Table 74 Participant responses to Stress/Anxiety, By Gender

	Males Total n = 26 n (%)	Females Total n = 31 n (%)	Total Total n = 57 n (%)
Listen to music	22 (84.6%)	25 (80.7%)	47 (82.5%)
Watch Television	16 (61.%)	22 (71.0%)	38 (66.7%)
Talk to my best friend	10 (38.5%)	20 (64.5%)	30 (52.6%)
Work out	10 (38.%)	16 (51.6%)	26 (45.6%)
Go for a walk	8 (30.8%)	18 (58.1%)	26 (45.6%)
Eat	12 (46.2%)	12 (38.7%)	24 (42.1%)
Yell or get angry	8 (30.8%)	13 (41.9%)	21 (36.8%)
Talk to my mother	7 (26.9%)	9 (29.0%)	16 (28.1%)
Talk to a brother or a sister	1 (3.9%)	12 (38.7%)	13 (22.8%)
Pray	4 (15.4%)	8 (25.8%)	12 (21.1%)
Fight with my parents	2 (7.7%)	10 (32.3%)	12 (21.1%)
Become aggressive (e.g., hitting someone/something)	7 (26.9%)	5 (16.1%)	12 (21.1%)
Talk to my father	2 (7.7%)	4 (12.9%)	6 (10.5%)
Drink alcohol	1 (3.9%)	3 (9.7%)	4 (7.0%)
Break my curfew	1 (3.9%)	3 (9.7%)	4 (7.0%)
Other	2 (7.7%)	2 (6.5%)	4 (7.0%)
Smoke	0 (--)	3 (9.7%)	3 (5.3%)
Talk to a teacher	1 (3.9%)	2 (6.5%)	3 (5.3%)
Use drugs	0 (--)	1 (3.2%)	1 (1.8%)
Talk to my guidance counsellor	0 (--)	1 (3.2%)	1 (1.8%)
Total	26 (100%)	31 (100%)	57 (100%)

Summary of the Stress/Anxiety Findings

The self-reported frequency and identification of stress/anxiety in this sample of adolescents can be summarized as follows:

1. The number of times per week stress/anxiety was reported by participant smoking status:
 - 1.1 Non-smokers, participants who tried but quit smoking, and smokers most often reported experiencing stress/anxiety 1-3 times per week.
 - 1.2 The difference between participants' smoking status on number of times stressed/anxious per week was not statistically significant.

2. The number of times per week stress/anxiety was reported by participant physical activity status:
 - 2.1 The physically inactive group reported experiencing stress/anxiety 1-3 times per week, 4-6 times per week, or more than 7 times per week.
 - 2.2 The rank ordering (highest to lowest) of reported experiencing stress/anxiety by the moderately active group are: 1-3 times per week, 4-6 times per week, none, and greater than 7 times per week.
 - 2.3 The rank ordering (highest to lowest) of reported experiencing stress/anxiety by the very active group are: 1-3 times per week, 4-6 times per week, none, and greater than 7 times per week.

3. 10.5% of the participants reported experiencing no stress/anxiety during the week, 63.2% experienced stress/anxiety 1-3 times per week, 22.8% experienced stress/anxiety 4-6 times per week, and 3.5% reported

experiencing stress/anxiety more than 7 times per week.

- 3.1 The majority of participants identified that they were stressed/anxious "1-3 x per week".
 - 3.2 The difference between male and female participants and the combined category amounts of stress/anxiety per week (i.e., none and 1-3 x per week combined; 4-6 x per week and greater than 7 x per week combined) was statistically significant. In other words, females reported experiencing stress more often than did males.
 - 3.3 More females than males identified that they were stressed/anxious "4-6 x per week", but this difference was not statistically significant.
4. The stressors identified by participants in this study are as follows:
- 4.1 Homework, exams, and parents were the top stressors for males, while for females the top stressors were exams, homework and parents.
 - 4.2 The difference between the number of male and female participants identifying friends and parents as being stressors were close to being statistically significant. More females than males identified friends and parents as being stressors.
 - 4.2 The difference between identification of adolescent stressors by participants smoking and physical activity status was not statistically significant.
5. Mean stressor scores by smoking status and physical activity status are as follows:

- 5.1 Mean stressor scores based on smoking status and physical activity status were similar.
 - 5.2 The difference between mean stressor scores by smoking status was not statistically significant.
 - 5.3 The difference between mean stressor scores by the moderately active and very active categories was not statistically significant.
6. Responses to stress/anxiety are as follows:
- 6.1 The most common responses to stress/anxiety identified by participants were listening to music, and watching TV.
 - 6.2 The difference between “fighting with parents” as a stress/anxiety response by male and female participants was statistically significant. More females than males indicated that they fought with their parents.
 - 6.3 Only three individuals identified smoking as a response to stress/anxiety.
 - 6.3 The difference between overall communication responses to stress/anxiety by males and female participants was statistically significant.

Summary

This chapter describes the questionnaire data. A total of 57 adolescents completed the questionnaire in the study. The majority of the participants were Caucasian, and 40% of them were employed. Approximately 37% of males and females had a history of HD in the family, and roughly 32% of the participants did not know if there was a history of HD in the family.

The majority of the participants in this study had never tried smoking

(52.6%). More females than males had tried smoking and more females than males continued to smoke. The amount and frequency of smoking varied in both males and females.

The majority of males and females reported being physically very active, and only a small number (5.3%, $n = 3$) were physically inactive. There was a statistically significant difference with males participating in golf, hockey, and soccer more than females, and females walked more than males. Both smokers and non-smokers were very active, but there was a statistically significant difference in that smokers reported walking more than non-smokers. Males reported higher physical activity ratings than did females and there was a statistically significant difference between the number of hours that males and females played computer games (males played more computer games than females).

The participants in the study were able to identify the major risks associated with smoking. There was a statistically significant difference in relation to smokers being less likely to identify lung disease as a health problem caused by smoking than non-smokers. Fewer smokers were able to identify heart disease, lung disease or stroke as being related to smoking. Overall the majority of students were able to identify the benefits of physical activity, but prevention of bone problems and prevention of lung disease were the two benefits that were the least known. A statistically significant difference was noted with smokers being less likely to recognize breathing as a benefit of physical activity than non-smokers. No specific questions were asked regarding the consequences of physical inactivity.

The only difference noted regarding adolescents' participation in physical activities which was close to being statistically significant was in relation to whether or not the adolescents' best friend encouraged them to participate.

Males in this category indicated that the majority of their best friends (73.08%) would “often” encourage them to participate in physical activities. In contrast, only 35.48% of females rated that their best friends would “often” encourage them to participate in physical activities.

In relationship to stress/anxiety more females than males identified that they were stressed/anxious “4-6 x per week”. Participants identified homework, exams, classmates, and parents as the top stressors with which they had to deal. The participants responses to stress/anxiety varied, but many adolescents reported that they listened to music, watched TV or worked out when they were stressed. Other responses that they often used included: “going for a walk”, “yelling”, “eating”, or “talking with a friend”. Only three individuals identified smoking as a response to stress/anxiety.

CHAPTER 5

DISCUSSION OF RISK FACTOR QUESTIONNAIRE FINDINGS

The purpose of the present study was to add to the existing knowledge base regarding the CVRF of smoking and physical activity/inactivity in the adolescent population. Prior to discussing the findings it is important to discuss the use of self-report questionnaires. The specific findings in relation to each of the four research questions will then be discussed.

Demographics: General

A total of 57 Grade 9 adolescents completed the questionnaire for this study (26 males, 31 females), and the majority of them were Caucasian (78.9%). Of those participants who completed the questionnaire, all of them had fathers who worked, and the majority of them had mothers who worked. When comparing participants' knowledge regarding whether or not there was a family history of HD, approximately one-third had a family history of HD, one-third did not have a family history of HD and one-third did not know. Family history of HD has been suggested as an important factor in determining adolescent risk behaviors (Howard, et al., 1991; Rabbia, et al., 1994). What is often postulated is that if a family has a history of HD this may reduce the risk-taking behaviors of other family members, or a family history of HD may be a "marker" for other members in the family to develop HD. Family history of HD is further discussed in relation to participant smoking and physical activity status group.

Self-Report Questionnaire Use

The validity of self-reported risk factor behavior is often questioned

because of the belief that adolescents will either under or over report risk-taking behavior depending on what they perceive is socially desirable (Amos, Currie & Hunt, 1992; Health and Welfare Canada, 1992; O'Malley, Patrick, Bachman & Johnston, 1983). Generally, the belief is that smokers will underestimate the amount smoked (Haley & Hoffman, 1983; US Department of Health and Human Services, 1990), or will deny smoking completely (Luepker, Pallonen, Murray, & Pirie, 1989; Murray, O'Connell, Schmidt, & Perry, 1987). A meta-analysis of 26 studies involving self-reported behavior and biochemical measures revealed that self-reports of smoking are generally at least as accurate as biochemical measures (Patrick, Cheadle, Thompson, Diehr, Koepsell, & Kinne, 1994).

The validity of self-reporting of physical activity status has, like smoking behavior, also been questioned in the literature (Klesges, Eck, Mellon, Fulliton, et al., 1990; Loumidis & Wells, 1998). Klesges, Eck, Mellon, Fulliton, et al., (1990) found that individuals were moderately accurate in recalling physical activity levels but underestimated sedentary activities and tended to overestimate aerobic activities. They also found that a difference existed with males overestimating their activity more than females.

Certain issues and limitations have been raised concerning the use of self-report questionnaires. However, interviewer administered questionnaires and combined observational and qualitative methods can validate the results and improve accuracy (Patrick, et al., 1994). Health Canada (1996) has reported that the use of self-report questionnaires with careful controls (e.g., research assistant administering the questionnaire and not the teacher; careful assurance to the adolescents of confidentiality of the findings) will increase the reliability of the results. This study was conducted with careful consideration to confidentiality of the findings and the researcher and/or research assistant

administered all of the questionnaires. A sub-sample of the individuals who completed the questionnaires also participated in focus group sessions which are described in Chapter 6.

Research Questions

Research Question #1 Discussion: What is the frequency of the CVRF of smoking, and physical activity/inactivity in a sample of adolescents?

Smoking

Smoking Status

In the study 52.6% of the participants had never smoked, whereas 47.4% had tried; of those who tried smoking 55.6% of them stopped and 21.1% of the total sample (44.4% of those who tried smoking) tried and continued to smoke. There was no statistically significant difference between participants who tried or did not try smoking or in those who tried smoking but quit or those who continued to smoke.

In relationship to the smoking frequency findings in this study, if there is any question as to the validity of the questionnaire data it would be that the frequency of smoking would be underestimated in the sample. Although the possibility is that the smoking frequency in this study is underestimated or denied, and it is not possible to know this conclusively because biochemical testing to confirm smoking status was not conducted, therefore results need to be interpreted with caution.

Another consideration regarding the description of smoking frequency is the definition of smoking status. Smoking status has been defined in a variety of ways within the research literature, and the following categories have been used: non-smokers, previous smokers, former smokers, smokers, ex-smokers, and initiated but quit (Bull, Pederson, Ashley, 1994; Health Canada, 1994; MCDermott, Sarvela, Hoalt, Bajracharya, Marty & Emery, 1992). It can be

difficult to make meaningful comparisons among studies as there are different criteria used to define smoking and categorize smokers. Moreover, Health Canada and other authors often use the standard criterion that individuals are defined as smokers if they have smoked at least 100 cigarettes. Consequently it is difficult to determine (and agree on) the length of time an individual must have refrained from smoking in order to be defined as an ex-smoker.

Adolescence is generally when first attempts at smoking occur. It would appear to be unreasonable to apply the same criterion (of having smoked at least 100 cigarettes to be considered a smoker) to adolescents. As the mean age of the participants in the present study was 14 years, it was decided that the smoking status categories this study would be defined as: *non-smokers* (those who never, even once, tried a cigarette), participants who *tried smoking but quit* (this refers to having tried once but quit) and *smokers* (those who tried smoking and continued to smoke even if just occasionally).

In comparing the smoking rates in this study to other national data it is important to note that the national data are generally described by age group and gender. In order to meaningfully compare the findings from the present study the data will be similarly described. Caution must be used in interpreting the findings of the present study in that the convenience sample was small and is not necessarily representative of the population of Grade 9 adolescents.

Although 47.4% of the participants in the study had tried smoking and 44.4% of those had continued to smoke (21.1% of the total sample) it is important to highlight that 52.6% of the participants had never tried smoking. Research studies often only comment on the number of adolescents who smoke. The number of non-smokers is an important finding that is often under documented or discussed. In order to prevent adolescents starting to smoke it is important to understand why certain adolescents do not try smoking, why

others try but quit, and why others try and continue to smoke. It is just as important to understand why these individuals do not try smoking as it is to understand why others try smoking. Unfortunately the questionnaire data did not provide information regarding possible reasons for adolescents not smoking.

Over 50% of the sample of adolescents had not tried smoking, whereas more females than males had tried smoking and more continued to smoke; however this difference was not statistically significant. A larger sample size might have detected a statistically significant difference in smoking rates between males and females. In comparing males versus female smoking rates the General Social Survey reported that, in Alberta 48% of young females between the ages of 15-24 years were smokers, while only 28% of males were regular smokers (Statistics Canada, 1997). The Canadian national average for smoking among 15-24 year olds is 31% (Statistics Canada, 1997). Overall, over 25% of females in the present study continued to smoke. It is important to note that in the present study the mean age of the sample was 14 years whereas the General Social Survey addressed individuals aged 15-25 (Grades 10 and beyond). The difference in ages may account for the lower numbers of female smokers represented in the present study. Older adolescent age groups generally have a higher percentage of smokers (Health Canada, 1996) and there appear to be more females "recruited" or influenced to smoke (Statistics Canada, 1997).

Findings from the present study revealed that 47.4% of adolescents had tried smoking at one time and 44.4% of those continued to smoke. The difference between male and female participants who tried smoking but quit and those who continued to smoke was not statistically significant. In comparison, Health Canada (1994) reported that in Alberta 6% of 10-14 year

olds were smokers. There is no age specific breakdown (i.e., the percentage of 10 , 11, 12, 13, and 14 years olds) provided in the Health Canada report. It is therefore difficult to compare the Health Canada results to the present findings, because there may have only been a few 10 and 11 year olds who smoked. This would tend to reduce the overall percentage of smokers. Because of the small sample size in this study, caution needs to be used in interpreting the results. However it is interesting to note that the prevalence rate of adolescents who have tried and continued to smoke in this study is similar to the rate reported in the 1997 General Social Survey (Statistics Canada, 1997) rather than the 1994 Health Canada report.

It is important to note that in this study there was not a statistically significant difference between male and female smoking rates. More longitudinal research with larger samples is necessary to clearly identify whether or not there is a gender difference between adolescent smoking rates similar to the trend suggested by Statistics Canada (1997). It would also be important to track first initiation of smoking and pattern of smoking behavior since it has been suggested that the earlier a individual begins smoking, the more likely it is that they will continue and the more they will smoke (Health Canada, 1996).

The mean age when participants in this study reported first smoking was 11.85 years. No statistical difference was found between male and female participants and the mean age at which they first tried smoking. Health Canada (1996) reported that the mean age of beginner smokers was between ages 13 and 14. The time at which individuals begin smoking does vary by sex, in that rates among 13-14 year old females are significantly higher than among males in the same age category (Health Canada, 1996) (although there is no difference between males and females aged 10-12 years). The reason for the slightly lower mean age when smoking was first tried may be due to fact that

the participants were all in the same year of school; it may be related to their SES status; behavior particular to the two schools used to collect data; or regional differences. There was no comparison of adolescents between the ages of 10-14 and above.

The number of days (frequency) and the number of cigarettes smoked (amount) by smokers varied from “none” in the past 30 days to “everyday”. This finding is similar to the national data. A difference was noted in that Health Canada (1996) reported that males age 10-14 have a tendency to smoke more than females but this level was not statistically different, while in the present study only 3 males continued to smoke and all of those smoked five or less cigarettes per day, while only two females smoked more than 11 cigarettes per day. However it is difficult to accurately describe the present data in relation to the representativeness to the national data because the age in the Health Canada study was between 10-14 while the mean was 14 in this study.

In summary, 52.6% of participants were non-smokers, 26.3% tried smoking but quit, and 21.1% were smokers. The differences between the number of male and female participants who tried and did not try smoking, and who tried smoking and continued to smoke were not statistically significant. Because of the low numbers in each category and differences in the ages, comparisons to the national data were sometimes difficult. More longitudinal research with larger samples is necessary to confirm the present findings and to identify whether or not there are any differences in relation to gender. It would also be important to track the age at which individuals first smoked and then the pattern of continued smoking behavior, based on preset defined smoking status groups in order that appropriate health promotion strategies can be developed to reduce tobacco use in adolescents.

Physical Activity/Inactivity

Physical Activity Status

Overall, the majority (64.9%) of the participants in this study were classified as being very active. Only 5.3% of participants were inactive and 29.8% were moderately active. In relation to the physical activity/inactivity status it is important to note that generally researchers refer to active and inactive individuals. Inconsistency reporting activity levels by researchers makes meaningful comparisons difficult. In general, *active* refers to exercising more than three times per week (15-30 minutes in length) and *inactivity* as exercising once or less per week (Heart and Stroke Foundation of Canada, 1993; Health and Welfare Canada, 1992). A difficulty arises in categorizing individuals who exercise between more than once and up to three times per week. It would appear from the literature that individuals in this category have been largely ignored. It was important in this study to conceptually define levels of physical activity in order to compare the findings. The researcher used three levels of activity to describe physical activity status, these were: *inactivity* (those individuals who participated once or less than once per week); *moderately active* (2-3 times per week of physical activity); and *very active* (participation more than 4 times per week).

Another aspect that needs to be considered in relation to physical activity is that the type and vigor of the activity is dependent on who is doing the activity. Although the broad classification of physical activity involves any activities that are done at least for 15-30 minutes, the Centers for Disease Control (Pate, et al., 1995) recommend that activities be of moderate intensity. They go on to give a breakdown of what activities are light, moderate and vigorous. Other authors not only include intensity, duration and frequency on physical activity rating scales but also measurement of heart rate (Duda,

Sedlock, Melby, & Thaman, 1988). In this study it was decided that data would be gathered regarding types of activities and the frequency of activities (activities must be at least 15 minutes duration).

The exercise frequency in this sample appeared similar for both males and females, and there were no statistically significant differences between male and female participants and level of physical activity. The majority of adolescents participated in physical activities four or more times per week (males 69.2%, females 61.3%) and were therefore categorized as being very active. In comparison, with the Health of Canada's Youth survey (Health Canada, 1992), 70.0% of males age 13 and only 40% of females age 13 participated in activities four or more times per week. The data for the males in this study were similar to the national data. However, females reported higher activity levels in this study compared with the national data. This variation may be due to a small sample size in this study, it may reflect that females in the School system being studied are more active, or it may be that females in a large urban centre are more active than adolescent females nationally. This difference may be related to the study sample not reflecting the population. It may also be that differences exist between provinces which were not reported in the national survey. Interpretation of the results in this study therefore, needs to be done cautiously.

The results of the present study are more similar to a recent study of junior and senior high school students in the United States which found that 63.8% of students were physically active three or more times per week (U.S. Department of Health and Human Services, 1998). Other factors such as socioeconomic status (SES) may also influence activity levels and need to be considered. Higher SES has been associated with increased membership and participation in organized sports activities (Health and Welfare Canada, 1992).

Adolescents from higher SES groups have more money available to purchase club memberships and sports equipment.

In the present study males and females engaged in a variety of sports and activities. Statistical differences were noted in a number of categories: more males participated in golf, hockey, and soccer; and more females participated in walking. These differences are not surprising since golf, hockey and soccer traditionally are considered to be male dominated sports. Why females are more involved with walking is not clear. It may be simply that females often “walk and talk” or “walk and shop”. The literature does not specifically address participation of males and females in specific types of physical activities making comparison impossible.

Overall, the adolescents in this study appeared to be active in a variety of sports and physical activities. Although both males and females ranked their level of physical activities as being high or moderately high, the majority of males rated their overall activities higher than females. This finding is supported by other researchers who have found that females do not see themselves as fit or active as do males (Health and Welfare Canada, 1992; Health Canada, 1996). Health and Welfare Canada (1992) found that 34% of males ranked themselves as being very fit and active versus only 13% of females. Adolescents in Canada rank very high in maintaining activity levels in comparison to other countries such as Finland, Poland, and Wales (Health Canada, 1992). Other studies have also looked at physical activity and have found varying results in relation to activity levels. Pebler, Hester and Connor (1987) reported that the majority of adolescents in their study exercised routinely. Rutenfranz (1989) on the other hand found that 50% of adolescents were inactive and Rabbia et al. (1994) found that 28.3% of males and 40.1% of females declared low levels of activity. In looking at the different studies it is

important to note that although similar activities were addressed in many of the studies, the type of scales used to measure activities, and the method of operationalizing activity were not consistent across studies and therefore it is difficult to make meaningful comparisons. In addition, there were differences with respect to SES across groups and geographic location both within and across studies (e.g., urban, rural). Differences in activity levels of males and females and influencing factors are important to note when encouraging more participation in physical activities in the schools and other organizations. Influencing factors that were identified are outlined under research question #3. During the focus groups other factors such as image and diet were addressed in relation to not being active. These results are discussed in the following chapter.

In relation to level of sports enjoyment, the majority of both males and females enjoyed sports "a lot" (75.0%). No statistical difference was noted between male and female participants and their rating of sports enjoyment. Only 3 out of 30 females stated they did not like sports very much, while no males reported that they did not like sports. Similar results were noted by the authors of the "Health of Canada's Youth" survey who reported that males appeared to be more involved in team sports and enjoyed participating more in a variety of sports than did females (Health and Welfare Canada, 1992). This subtle trend for females to be less involved and less likely to enjoy sports may be related to our culture and societal norms. It raises a question regarding whether individuals and organizations in society value male participation more and encourage males to be more active than females.

Differences in sports enjoyment in this study were also looked at in relation to physical activity status. No comparison was possible between the inactive group because of the low numbers of inactive participants. However,

the difference between the moderately active and very active groups and enjoyment of sports was statistically significant with more very active participants enjoying sports "a lot". No other studies to date have addressed differences in relation to sports enjoyment by physical activity status. Intuitively it makes sense that very active participants enjoy sports more, and the reason may simply be that they enjoy physical activities more because they participate more, or that they participate more because they enjoy more. Other reasons may be that very active participants are encouraged more or that they are more likely to be on sports teams or organized sports. It would be important in future studies to address differences in enjoyment levels more comprehensively in order to understand differences between different physical activity levels. Understanding the differences in enjoyment from different physical activity levels would help to develop health promotion strategies to encourage and improve adolescents' life-long physical activity involvement, thereby improving overall health status.

Leisure-time activities such as watching television, movies, and playing computer games, which are more sedentary, and solitary, were also compared. Comparisons of watching TV, VCR movies and playing computers were made by gender and by physical activity status. Although no statistically significant difference was noted between male and female participants watching TV or VCR movies, a statistical difference was noted in relation to playing computer games. Males in general played more computer games than did females. This finding is not surprising as the majority of computer games are targeted at more male dominated activities (e.g., war games, car racing). Being aware that males use computer games more could be very beneficial when developing health promotion strategies that target males. In this study the majority of males tended to watch seven or more hours of TV per week. It is difficult to

compare the results from the Health Canada survey (1992) because they used a different scale was used and the amount of TV watched per day rather than per week was measured. Even with these differences certain similarities were found in that Health and Welfare Canada (1992) reported that males watched more TV, videos and played more computer games than did females.

It is important to note that physical inactivity does not necessarily translate to the sedentary activities of watching TV, VCR movies, or playing computer games. Other activities such as listening to music and generally not doing anything may also be considered inactivity. These other activities were not measured in this study. It would be important to include a comparison of these activities and smoking and physical activity/inactivity in future studies.

When analyzing the data based on physical activity status it was noted that participants who were physically inactive also reported lower levels of watching TV, VCR movies, and played computer games less than one hour per week. Although the number of inactive participants was very small it would be important to carefully consider possible differences in relation to this group. If, in a larger sample, the inactive participants reported lower levels of leisure activities, as discussed above, this would have implications for use of these types of media in health promotion strategies. In other words, adolescents who are physically inactive may also be inactive in leisure activities and therefore those activities would not be appropriate ways to involve inactive participants. More moderately active and very active participants watched seven or more hours of TV, and played more hours of computer games than did inactive participants. It is interesting to note that the very active participants played 10 or more hours per week of computer games. One might postulate that computer games are just another type of activity in which the mind is being stretched and therefore they might be considered to be

activities. Playing of computer games also does encourage hand eye coordination. No studies identified participation of sedentary activities based on activity level and therefore no comparison is possible.

Male and female participants were asked to rank their overall physical activity on a scale of 1 - 5. The difference between the level of overall physical activity in male and female participants was statistically significant. In other words, males indicated that their overall physical activity rating was higher than females. Interestingly although no *statistical* difference was found between male and female participants' level of physical activity, males ranked their overall physical activity higher than females. This may be related similarly to sports enjoyment as mentioned previously. Males generally do rank their enjoyment higher and this may also influence their overall physical activity rating. These findings are supported by Health and Welfare Canada (1992) who found that males rate their perception of fitness higher than do females.

When comparing the overall physical activity rating by physical activity status, participants who were very active rated their activity more often as 4 or 5 (high) than did moderately active and inactive participants. Although comparison was not possible between the three physical activity levels, the moderately active and the very active categories were compared and a statistically significant difference was noted in relation to overall physical activity. The results intuitively make sense in that moderately active participants would rank lower in their overall physical activity than participants who were very physically active.

Smoking and Physical Activity

One of the most interesting outcomes from the questionnaire is that it has become clear that there is a need to investigate the multifactorial effects

of risk-factors specific to CVD. The results of the study show that in a convenience sample of 57 adolescents, the CVRFs of smoking and physical activity/inactivity co-occur. Nine subgroup categorizations were developed which used smoking x physical activity as the main factors: (1) inactive smokers, (2) moderately active smokers, (3) very active smokers, (4) inactive tried but quit smokers, (5) moderately active tried but quit smokers, (6) very active tried but quit smokers, (7) inactive non-smokers, (8) moderately active non-smokers, and (9) very active non-smokers. While none of the adolescents included in this sample were categorized as inactive smokers or inactive tried but quit smokers, it is reasonable to suggest that a larger sample size might have resulted in participants being included in these categories.

The fact that CVRFs rarely occur as single conditions has recently been addressed in the cardiovascular literature (Berenson, et al., 1998; Noble & Modest, 1996). Indeed, the fact that they often act synergistically has led to the view that it is important to comprehensively review the interaction and management of CVRFs. A number of studies (as outlined in the literature review) have described rates, prevalence and influencing factors of both smoking and physical activity; the difference in this study is the inclusion of the combination of smoking and physical activity status in the same sample. The risk factors were defined not only in regard to basic descriptive characteristics but also in relation to the different categories of smoking and physical activity status. This study is the first step in combining different levels of smoking and physical activity into categories within a sample and describing similarities and differences between the combined categories.

As noted, one of the unique aspects of the present study was the examination of smoking status by physical activity status. One might expect that non-smokers would be the most active and that smokers would be the

least active. This was not the case in this study. The inactive category (regardless of smoking status) had very small numbers of participants making comparisons difficult. The cells for non-smokers who were very active and smokers who were very active had the largest number of participants.

Health and Welfare Canada (1992) and Health Canada (1996) refer to non-smokers being more active than smokers. Although they assess both smoking and activity and make statements that combine both categories these specific combined categories are not outlined in their analysis or written reports. Mendoza, Batista-Foguet and Oliva (1985-1986) found that smoking, alcohol consumption and unhealthy food habits were linked to physical inactivity. In the present study, non-smokers, those who had tried smoking but quit and smokers reported moderate to high activity levels. The difference between the Health and Welfare Canada (1992) and Mendoza, Batista-Foguet and Oliva (1985-1986) findings may be due to low numbers of smokers, but may also be due to the fact that in the present study the adolescents who smoked had only just tried or begun smoking consistently. It would be important to ask the same questions regarding physical activity levels as the adolescents got older and smoked for longer periods. In general, adolescents who smoked in the study tended not to be not heavy smokers. Consequently they may not have been smoking excessively and long enough to notice a difference in their cardiovascular fitness, breathing ability and stamina. Respiratory problems and changes in lung compliance and resistance occur over time and there is a direct relationship between the amount and type of cigarettes smoked, and the time-line within which complications occur (McCance & Huether, 1998).

It is speculated that the difference between activity levels of non-smokers and smokers may be due to the age of the participants in each of the studies. Health and Welfare Canada's study (1992) was a national sample and

no provincial breakdown was provided. It may be that there are differences between physical activity levels and smoking within each province that are not reported. Another factor that is necessary to consider is the difference in physical activity classification. The national studies report overall general activity status as being active or inactive. No breakdown is provided for participants who do not fall into either the inactive or active categories. Only a small number of students in this study were inactive (5.3%), but 29.8% of participants were classified as being moderately active. Caution needs to be used in interpreting these results not only because of the small sample of inactive participants but also because of the small sample of smokers.

In comparing adolescents, in the present study, who did not smoke with those who did, there was no statistically significant difference found in the sports in which they participated. Male and female, non-smokers, those who tried smoking but quit and smokers were very active.

In conclusion, although minimal data was available in some of the categories when smoking and physical activity status groups were combined, these combined categories are significant and critical areas to further explore. This study was the first step in combining different levels of smoking and physical activity into categories within a sample and describing similarities and differences between the combined categories. From the standpoint of this study, a better understanding of the multiple CVRFs of smoking and physical activity/inactivity provides valuable information from which specific adolescent health promotion strategies can be planned and implemented.

Research Question #2: What knowledge do adolescents have regarding the cardiovascular risk factors of smoking and physical inactivity?

The need for individuals to have knowledge regarding health consequences of smoking and physical inactivity has been emphasized in the literature because it is believed that it will influence behavior (Bull, Pederson, & Ashley, 1994; Eckhardt, Woodruff, & Eider, 1994; Eriksson, Kaati, & Bygren, 1998; Health Canada, 1996). The degree to which knowledge of health problems associated with smoking together with the benefits of physical activity and their contribution to deterring adolescents from participating in risk-taking behaviors is unclear. One might assume that high levels of knowledge regarding health problems caused by smoking would result in lower smoking rates, and high knowledge regarding the benefits of physical activity would result in higher physical activity involvement.

In this study knowledge of health problems associated with smoking was related to the three smoking categories, and knowledge of the benefits of physical activity was related to the three physical activity categories. Initially, knowledge of specific health problems will be highlighted from the overall group and differences noted between smoking status and physical activity status. Mean smoking knowledge scores, and mean physical activity benefits knowledge scores will also be addressed.

Knowledge regarding CVRF of Smoking

Cancers and Lung Conditions

In this study all participants regardless of smoking status group were able to identify that lung cancer was caused by smoking. Both lung cancer and lung conditions were the most commonly chosen responses from the

adolescents. This finding is comparable to Health Canada's national study (1996) which reported that young Canadians had knowledge regarding smoking and one of the most common identified health problems was lung cancer. The majority of participants in this study were also able to identify that other cancers may also be caused by smoking. One adolescent mentioned mouth cancer as being associated with smoking. Although smoking does potentiate an increased association with most cancers, mouth cancer is usually related to chewing tobacco and pipe smoking and not necessarily cigarette smoking (McCance & Huether, 1998). Health promotion strategies in both the schools and the media have focused on lung disease and cancer as major effects of smoking. These strategies have often included showing individuals pictures of black lungs. It is therefore, not surprising that the adolescents were able to identify lung conditions and cancer as conditions/diseases associated with smoking.

The only statistically significant difference in relation to participants (by smoking status) identifying health problems caused by smoking was in the identification of lung disease (100% of non-smokers compared to 75% of smokers identified lung disease). On analysis it became clear that the difference between participants being able to identify lung disease was between the non-smoking and the smoking participant groups. One might speculate that one reason for the difference in knowledge regarding the effects of smoking on the development of diseases and conditions may be that adolescents at different ages lack the ability to conceptually understand the consequences of participating in high-risk behaviors. However, there was no difference between the ages of the smokers and the non-smokers in this study.

Another more plausible reason may be that the smokers have not encountered any effects or difficulties in relation to activities and therefore they

do not believe that smoking can influence health. Health effects from smoking are usually long-term in nature, with many diseases only being identified after years of smoking (e.g., Chronic Obstructive Pulmonary Disease). Because the adolescents do not have any symptoms and their lifestyles do not seem to change immediately, they may convince themselves and each other that smoking does not cause health problems. Adolescents might also have a strong sense of invulnerability preventing them from believing that health problems can happen to them. They also have the belief that “when the time comes, I will stop smoking”. This is discussed more in the focus group chapter analysis.

Heart

Heart disease and stroke (both of which are part of cardiovascular disease) were not as well identified by the adolescents. The adolescents who smoked were even less likely to identify heart disease and stroke as being related to smoking. Speculation regarding why this may be includes: the large media campaigns related to smoking and lung cancer; focus on lung function and breathing in the junior high curriculum (personal communication with Grade 9 Teacher); general lack of knowledge regarding how smoking can affect body systems other than the lungs. A study of “out of mainstream” adolescents (those adolescents who are not going to school and do not live at home, but are usually living on the streets or clubs/half-way houses) found that adolescents more commonly associate smoking with lung cancer and lung disease and not heart disease (Then, Pryce & Good, 1996). Only 8.8% of respondents indicated that heart disease was affected by smoking. In comparison, in the present study over 75% of participants were able to identify heart disease as a health problem caused by smoking. The reason why there

was a difference between the two studies may have to do with the different adolescent subsets that were recruited. For example, the majority of the out-of-mainstream adolescents smoked, while only 21.1% of the participants smoked in the present study.

It may be that smokers do not want to know about the effects of smoking on the cardiovascular system, and they turn a deaf ear to information. CVD does not produce symptoms of angina for a number of years and usually not before 50-70% of the arterial lumen is occluded. Individuals will often have other symptoms (e.g., shortness of breath) prior to developing detectable cardiac pathology. Another factor that may impact on adolescents not being able to identify the association between heart disease and stroke with smoking is because of less publicity regarding CVD and smoking. Cardiovascular disease also does not have the same impact as cancer and lung disease and media campaigns often focus on lung disease and cancer.

Other

Arthritis was identified by more males than females as being related to smoking. At this time, the literature does suggest that arthritic changes to heart valves can occur (McCance & Huether, 1998), but this is very rare and not something that is normally taught or understood by the lay public. Therefore, the researcher would not expect the adolescents to be able to make any meaningful connection between arthritis and smoking.

Similarly, diabetes was not well identified by adolescents in the study as being related to smoking. Diabetes is affected by smoking in that it potentiates cellular changes that are often masked until significant damage has occurred. Diabetics often develop cardiovascular disease because of

premature atherosclerosis, low levels of High Density Lipoproteins (HDLs), lipoprotein oxidation, and proliferation of subendothelial smooth muscle (McCance & Huether, 1998). Therefore, it is important that adolescents understand the effect that smoking can have on diabetes and CVD.

Overall, participants in this study were able to identify many of the health problems caused by smoking. In relation to the identification of health problems by smoking status it was noted that as would have been expected non-smokers scored the highest in being able to identify health problems caused by smoking, followed by the individuals who had tried smoking but quit, and then by the smokers. In this study more non-smokers identified the health problems of other cancers, heart disease, stroke and lung disease, and less energy/strength than did the adolescents who smoked. In the Canadian Young Smoking survey (Health Canada, 1994) the researchers reported that non-smokers were more likely to think that there is danger to health from cigarettes than their peers who smoke. One might ask why those individuals who do not smoke have better knowledge regarding some of the health problems. One plausible explanation may be that they are at a different developmental stage and cognitive functioning. Another explanation may simply be that better knowledge of health problems caused by smoking leads to less individuals smoking. This concept is further explored in the Chapter 6.

Smoking Knowledge Scores

As will be recalled from the results section of Chapter 4 smoking knowledge scores were calculated by summing the number of health problems that each participant identified from the list provided. There was no statistically significant difference between knowledge scores in males and females. When knowledge scores were calculated according to smoking status,

smokers scored the lowest with respect to knowledge about health problems associated with smoking. Bull, Pederson and Ashley (1994) found that knowledge tended to decrease for smokers and increase for non-smokers. They compared knowledge scores at two separate times and found that, although there was no significant knowledge change from time one to time two, there was a significant interaction between non-smokers and smokers knowledge. In this study when analysis between groups was done no statistical difference in relation to mean smoking scores was noted between non-smokers, participants who tried but quit smoking, and smokers. In other words knowledge did not appear to affect smoking behavior. One might expect that smoking knowledge should make a difference on smoking risk-taking behavior, but this is not supported by this study. One reason may be that smoking knowledge was not explored in depth and differences may be found if more specifics related to smoking effects be investigated. Another reason for the lack of differences in mean smoking knowledge scores between participant smoking status may also be related to the small sample size of smokers (n = 12 smokers). Although the unequal numbers in each category were statistically controlled, a larger sample in all smoking categories might have produced different findings. Another area to consider is that other influencing factors on smoking may also be related to differences in behavior. In essence the analysis supports the idea that knowledge in and by itself is not a significant factor in risk-taking behavior. This does not mean that knowledge is not important, just that by itself without consideration of other influencing factors it is not as important as often insinuated.

In conclusion, adolescents do have some basic knowledge regarding the CVRF of smoking. Although adolescents seem to be able to identify the major diseases associated with smoking the items on the questionnaire did not

address their depth of understanding of knowledge regarding risk factors, why these diseases occur and how these diseases are affected by smoking.

Furthermore no information was obtained from the questionnaire regarding knowledge of health and it's relationship to smoking behaviors. Data were gathered in the focus groups regarding how diseases affected their beliefs about smoking and the resulting behaviors.

Smoking knowledge scores across the three smoking status groups revealed that smokers had lower mean knowledge scores than participants who were non-smokers, or had tried smoking but quit. The difference between smoking knowledge scores and smoking status, was not statistically significant. In future research it would be interesting to assess knowledge scores at different time periods to determine knowledge scores change over time in the three smoking status groups.

Knowledge regarding Physical Activity/Inactivity

Benefits of physical activity include both physiological and psychological factors. Only physiological benefits were addressed in the questionnaire items. Psychological benefits of physical activity were addressed more comprehensively in the focus groups.

Breathing and Prevention of Lung Disease

Improvement in breathing and prevention of lung disease are the most commonly cited benefits of physical activity (Farzan, 1992; Health and Welfare Canada, 1992). It is interesting to note that adolescents in the present study rated breathing and the prevention of lung disease quite differently. This suggests to the investigator that these adolescents do not understand how physical exercise improves lung function and potentially prevents disease. The

adolescents did identify the benefits of physical activity in relation to increased mobility, feeling good and in providing energy and building strength. Differences in knowledge regarding breathing as a benefit to physical activity may be related to smoking status as well as physical activity status. With respect to physical activity benefits by smoking status, 93.3% of non-smokers in comparison to 66.7% of smokers, were able to identify breathing as a benefit of physical activity. This difference might be related to the fact that smokers have vasoconstriction of vessels when they breath in and have obstruction to outflow of air due to mucus, therefore causing breathing changes (Farzan, 1992). When smokers work out they may have more difficulty in "catching their breath" and they may have less energy due to the increased workload on the heart related to hypoxia and catecholamine release. This will make it more difficult for smokers to breath. Smokers therefore would not experience the benefits of exercise to the same extent because their heart and lungs would have to work harder. Smoking also prevents optimal exercise endurance and lung expansion (Farzan, 1992).

Prevention of Heart Disease and Bone Problems

When comparing the benefits of physical activity by physical activity status, two statistically significant differences were observed; the prevention of heart disease and bone problems. The analysis of these findings though is questionable because of unstable cell sizes. The difference between participants and being able to identify prevention of heart disease as a benefit of physical activity may be as a result of active participants who "feel" the physiological effects of exercise (e.g., heart rates increase with activity). This increase in heart rate with exercise and consequent improved cardiac output is often discussed in physical education and health classes (personal

communication, Grade 9 Teacher) but those individuals who are more active will actually experience the increases in heart rate. The personal experience may account for the improved knowledge regarding cardiac physical activity benefits.

The benefit of preventing bone problems was also statistically different across the physical activity categories, but as with the prevention of heart disease the cell sizes were not stable and therefore caution needs to be taken when interpreting the results. The difference identified was between adolescents in moderately active and the very active category. It is speculated that this difference may be simply due to improved strength and endurance with physical activity because more physical activity is associated with improved health and body composition (Pate et al., 1995). Overall, there were no statistically significant differences noted between males and females and their knowledge of the benefits of physical activity.

Physical Activity Knowledge Scores

As will be recalled from the results section of Chapter 4 physical activity knowledge scores were calculated by summing the number of benefits that each participant identified from the list provided. Knowledge scores regarding the benefits of physical activity were calculated for each participant based on physical activity status (i.e., inactive, moderately active, or very active). There was no statistically significant difference between physical activity knowledge scores in males and females. When physical activity knowledge scores were compared across physical activity status groups, inactive participants were identified as having the lowest mean knowledge regarding benefits of physical activity, while moderately active participants had the highest mean physical activity knowledge scores. Intuitively it makes sense that the inactive

participants would have the lowest knowledge scores since they would not experience the physiological effects associated with physical activity. Caution needs to be used when trying to meaningfully interpret these results because of the low number of participants who were inactive. A more comprehensive review of knowledge regarding physical activity benefits with a larger sample is needed. Understanding differences in knowledge by each physical activity group would be essential in the development of strategies aimed at improving and maintaining physical activity levels from adolescence to adulthood.

In summary, adolescents in this study were able to identify many of the benefits of physical activity. Differences existed in relation to the identification of preventing heart disease and bone problems by different physical activity groups. It would be interesting to track over time to see if there are any differences in relation to gender and physical activity status and the ability to identify physical activity benefits. Inactive participants may not see the advantages of physical activities for a number of reasons that may include: lack of experience, denial, disbelief, or poor or inadequate knowledge. It would be interesting to gather more in-depth information regarding beliefs, knowledge and understanding regarding physical activity for the different physical activity groups.

Knowledge regarding Smoking x Physical Activity

One of the unique aspects of this study was the combining of the smoking and physical activity findings related to knowledge. A Pearson product moment correlation coefficient was computed ($r = 0.75$) to correlate the knowledge scores for smoking and physical activity benefits and a high correlation between knowledge related to health problems associated with smoking and knowledge regarding physical activity benefits was found.

One might expect that individuals who are very active non-smokers would have the highest knowledge scores, and that inactive smokers would have the lowest scores. One of the difficulties was that in a number of the categories (e.g., inactive smokers) there were inadequate numbers to make comparisons. Clearly the combination of knowledge scores related to risk behaviors would be valuable information to obtain when developing health promotion strategies appropriate for the different smoking and physical activity groups.

Research Question #3: What individuals and factors do these adolescents think influence the CVRF of smoking and physical inactivity in themselves and other adolescents?

Factors Influencing Smoking

It is important to investigate why some adolescents begin to smoke and why others do not. Friends, family members, media, and peer pressure are factors that have been mentioned in the literature in relation to influencing smoking behaviors (Bewley, Bland, & Harris, 1974; Biglan, McConnell, Severson, Bavry, & Ary, 1984; Health Canada, 1994; Winkelstein, 1992). In this study, data were collected on six influencing factors: companion for first smoking experience, companion for adolescents who continue to smoke, reasons to continue smoking, family, friends, and family history of heart disease.

Research indicates that friends are an important factor in whether or not adolescents try and/or continue to smoke (Health Canada, 1996; Health and Welfare Canada, 1992; Hover & Gaffney, 1988; Stacy, Sussman, Dent, Burton & Flay, 1992). The findings in this study are consistent with the previous research in that the majority of adolescents who tried smoking identified that they first smoked with friends.

Reasons for adolescents continuing to smoke have not been clearly delineated in the literature. However influences such as parental smoking, peer smoking and stress have been suggested as possible influences on adolescent smoking (Health and Welfare Canada, 1992; Hover & Gaffney, 1988; Stacy et al., 1992). It is important to note that in this study 90.9% of participants who continued to smoke, smoked with a companion and only 9.1% smoked by themselves. This supports other research that suggests that smoking is often a "social" event and is reinforced by different types of pressure (Health and

Welfare Canada, 1992, Health Canada, 1996).

Many of the participants who continued to smoke smoked with friends. However, only 2 of 12 adolescents in the current study identified that the most important reason to continue smoking was friends who smoked. Other reasons that were identified included: being addicted and not being able to quit/feeling the urge, and one female identified that it made her feel "grown up". Four females identified that the most important reason to continue to smoke was because it was relaxing. These findings are consistent with others which suggest that there are many reasons for adolescents to continue to smoke. In addition, the longer they smoke the more likely they will become addicted and feel they need to continue to smoke (Health Canada, 1994; Morbidity and Mortality Weekly Report, 1998).

The potential anxiolytic effect of smoking as identified by the female participants, who continued to smoke, is controversial within the literature. Some studies have found that smoking does affect subjective stress (Jarvik et al., 1989; Perkins, Grobe, Fonte, & Breus, 1992), while others have found little or no effect (Cohen & Lichtenstein, 1990; Fleming & Lombardo, 1987). Smoking appears to have different effects on different individuals and it is important to keep this in mind when trying to understand the reasons for adolescents continuing to smoke (Perkins et al., 1992). Although the questionnaire did not provide any further information regarding how smoking is relaxing it is important that this belief is explored and better understood. If smoking rates are to be reduced, it is important to understand the role that smoking has during adolescent development and the development of strategies to reduce stress/anxiety might be necessary.

Another factor associated with whether or not individuals smoke is the smoking behaviors of family members and other individuals in the home. In this

study 50% of participants did not have any family members who smoked in the home. A number of factors that have been identified in the literature that may influence an individual's decision not to smoke include: different values, positive self-image/esteem, family support and positive family image (Glendinning, Shucksmith & Hendry, 1997; McDermott, Sarvela, Hoalt, Bajracharya, Marty, & Emery, 1992; Winkelstein, 1992). These factors were not investigated in the survey questionnaire component of the present study but information was gathered during the focus group interviews.

Of those adolescents who had smoke-free homes only two females out of 12 smoked. In this study participants who had smoke-free homes were more likely not to smoke. Parents were the most frequently identified family members who smoked in the household. Similarly Harrell and Frauman (1994) found that 57.2% of adolescents who smoked had at least one parent who smoked. Pebler, Hester, and Connor (1987) found 39%, while Health Canada (1994) found that 46% of smoking adolescents had at least one parent who currently smoked, and 21% had two or more regular smokers at home. Pebler, Hester, and Connor (1987) found that of those adolescents who smoked and had at least one smoking parent, 12.5% were males and 87.5% were females.

In this study there were small numbers of adolescents who tried smoking and continued to smoke ($n = 12/57$ or 21.1% of the total sample). Of the males who continued to smoke ($n = 3$), three had mothers who smoked and one had a father who smoked. Of the females who continued to smoke ($n = 9$), two had mothers who smoked (one did not answer this question), and all eight of the females who answered this question had fathers who smoked. All comparisons done between male and female participants and different family members who smoked were not statistically significant. In contrast, the "Youth Smoking Survey" by Health Canada (1994) reported an association between

youth smoking and parental smoking, and reported that there was a stronger association with females and mothers smoking than with males and either parent. In this study all males who smoked had mothers' who smoked. Only two females had mothers who smoked, but all had fathers who smoked. The reason for having more fathers who smoked may be due to possible differences in the population characteristics. However, the "Youth Smoking Survey" took place in 1994 and it may not be representative of changes that have been occurring over the past few years in relation to adolescent smoking behavior. Due to the small sample in this study it is difficult to make definitive statements about parental influence on adolescent smoking behaviors based on the questionnaire results and further research in this area is warranted. Although certain authors (Health Canada, 1994; Winkelstein, 1992) discuss a direct association between parental smoking and adolescent smoking, considering the evidence, it appears that this is not a linear relationship. Many other factors such as parental relationships, attitudes and beliefs may influence adolescents' desire to smoke or not to smoke. These ideas were explored in the focus group interviews and are discussed in Chapter 6.

The mean number of smokers in the home was also identified. Participants who were non-smokers or who had tried but quit smoking came from homes where there were significantly less individuals who smoked than participants who were smokers. This finding is important to the extent that it supports the notions that smoking behavior of other individuals may affect adolescent smoking status. This influence may be because adolescents are not discouraged from smoking by family members and that it is "just the norm" for the family. One might also speculate that the ETS exposure has contributed to adolescents beginning to smoke. The higher ETS exposure in the home may also contribute to the continuation of smoking and earlier addiction. Bull,

Pederson and Ashley (1994) also found that non-smokers and individuals who had tried smoking but quit were more likely to have similar characteristics than smokers. Health Canada (1996) found that there was a strong association between the number of individuals who smoked regularly at home and the smoking status of the youth.

Similarly to the Health Canada report (1996) there was no apparent difference between males and females and the number of people smoking in the home. One difference to note is that the Health Canada study looked specifically at whether or not individuals in the home smoked regularly, while in this study participants were just asked whether or not specific individuals smoked in the home. No reference was made to the degree of smoking in the home. One might suggest that perhaps the amount that is smoked may not necessarily make a difference as to whether or not the adolescent continues to smoke. It would be important to conduct further research looking at adolescent smoking status and the influence that individuals have in the home and compare whether or not different smoking frequencies have an influence on smoking status of the adolescent. Other factors such as role models (e.g., parents) might also influence adolescents during their formative years. This may impact on their decision to smoke or not in later life. Positive non-smoking role models and respect for parents may have some influence on whether or not adolescents begin to smoke or participate in risk-taking behaviors.

The influence of friends on the continuation of specific behaviors such as smoking has been identified in the research literature (Health Canada, 1994; Morbidity and Mortality Weekly Report, 1998; Winkelstein, 1992). In this study just over 50% of the adolescents had no close friends who smoked. On closer observation, it was noted that of those who had no close friends who smoked only 25% of adolescents were smokers, 15% had tried smoking but quit and

60% were non-smokers. Smokers had greater than 50% of their friends smoking and the non-smokers and the tried smoking but quit adolescents had fewer than 50% of their friends who smoked. Similarly, Health Canada (1996) found that there was a strong relationship between youth smoking rates and the number of friends who smoke. In particular they found that the strongest association regarding friends smoking was in the age category of 15-19. These results clearly have health promotion and program planning implications. Programs need to be developed that work not only with individuals but also with peer groups in order to potentially change risk-taking behaviors. It would also be important to target interventions early and have consistent follow-up keeping in mind developmental and cognitive changes and transitional issues that arise in adolescence.

In relation to smoking and history of heart disease, no statistically significant differences were noted between adolescents' smoking status and family history of heart disease. It is interesting to note that more adolescent males who smoked did *not* have a family history of heart disease (HD), whereas there were more females who smoked and *did* have a family history of HD. One might speculate that a family history of HD might be a "marker" for *smoking* (i.e., if there is a history of HD then the adolescent might be in a family environment where smoking is accepted and the link between smoking and HD is not realized). One might expect that where there is a family history of HD, there would be more smokers in that family. In fact, with the male adolescents, the opposite was the case, there were fewer male smokers in families with a history of HD. One possible explanation is that HD in the family influences male adolescents not to smoke.

The same can not be said for adolescent females. More females who smoked in this study had a family history of heart disease. One assumption

related to this finding is that the females believe HD affects men and not women. HD might be viewed as a “male” disease, and therefore females do not believe they are at risk. If females recognized that HD can affect both genders they may be more inclined not to smoke.

More research is needed in this area with larger sample sizes to better understand whether males do not smoke because of their awareness of smoking and HD and other diseases, and to see if females consider HD as a male condition. There is a distinct lack of literature related to these areas from the adolescent population. It is emphasized that it is difficult to make substantive statements concerning this because sample sizes were small.

One male in the study indicated that he had heart disease and yet he had tried smoking and continued to smoke. He indicated that the number one reason why he continued to smoked was because of his friends. Obviously his friends had more of an influence on his belief system than his beliefs about smoking and possible effects on his heart. This emphasizes one of the investigator’s major contentions, that *knowledge* of the link between smoking and HD is a necessary, but not sufficient component of quitting. If the adolescent *believes* it is important to be with friends, and to do what friends do, this may outweigh any influence that may come from a family member having HD. On reflection, it appears that the participants may not understand and internalize, or choose not to accept and deal with the fact that a decision to smoke now affects them later in life. This is important as it relates to cognitive development theory (i.e., given adolescents’ stage of development, they have a difficult time “seeing” that what they do now has some bearing on future events). This is substantiated in the literature in that during adolescent development, cognitive processes approach the level of formal operations in which adolescents are beginning to develop the capacity to think hypothetically

and be able to identify consequences specific to certain behaviors (Curtis, 1992). Curtis goes on to explain that adolescents often engage in potentially harmful risk behaviors because they lack the life experience that often is necessary to understand subsequent consequences of their risk-taking activities.

Other factors that may influence smoking behaviors in adolescents include job status and allowance. Although these factors were briefly discussed in research question # 1 further comparisons were made in relation to smoking status. In order for adolescents to smoke, they need to be able to buy cigarettes. Receiving an allowance or having a job provides adolescents with the means to purchase cigarettes. Legally individuals must be 18 years of age in order to buy cigarettes, but adolescents and by-law officers frequently report that getting cigarettes is very easy for under-age teens (Health Canada By-Law Officer, Personal Communication, September, 1998). Neither job status nor receipt of an allowance were statistically related to the smoking status of participants. More smokers had jobs than non-smokers and individuals who tried smoking but quit. This factor may be more related to SES which also has been suggested to influence smoking behavior (Health Canada, 1996).

As may be recalled from Chapter 4, the majority of the adolescents had jobs and/or received \$6.00 - \$10.00 allowance a week. Overall, the adolescents who smoked (except for one) had money to purchase their own cigarettes. It is not possible to claim a direct cause and effect relationship between smoking and being employed, because not all adolescents who received an allowance, or had a job, smoked. What this does suggest is that those who chose to smoke had opportunity or resources to support the habit.

Factors Influencing Physical Activity/Inactivity

In this study data were collected on a number of influencing factors that included: reasons to participate in activity, reasons not to participate, encouragement by family, friends and others, activity level of family, friends and others, and family history of heart disease. Inactive participants indicated the most important reason for taking part in physical activity was to see friends, while the moderately active and very active participants indicated that getting in good shape was the most important reason to be active. On comparing the reasons to participate in activity by physical activity status, no significant differences were noted.

Reasons to participate are often reported in the literature to be different in males and female. Therefore the questionnaire results were reported by gender. Although the analysis of the reasons to participate in physical activities were similar for males and females, some differences did exist. Having fun was listed in the top three reasons to participate for both males and females. What was interesting but not surprising was that there was a statistically significant difference in two areas: "looking good" and "getting into good shape". Females were more likely than males to indicate that looking good was a very important reason to participate in physical activities. In contrast, males were more likely than females to indicate "getting into good shape" was a very important reason to be physically active. The findings from the Health and Welfare Canada report (1992) do not indicate any differences between males and females in the areas of "looking good: or "getting into good shape". The discrepancy in these studies may be reflective of differences at a provincial level that are not present at a national level. They also may be related to changes in beliefs and values in society that have reinforced a belief that females and males are influenced by different factors (e.g., self-image is

more important to females). Reasons for participating in physical activities were further explored in the focus group interviews.

The top two reasons given by females for participating were “being in good shape” and “improving health”. Possibly the reason for females indicating “being in good shape” as the most important is in relation to body image. Females in adolescence are often fixated regarding body image and weight (Wertheim, Paxton, Schutz, & Muir, 1997) and physical activity or participation is seen as a method to improve body image and reduce weight.

The issues of body image and weight reduction might also be related to smoking initiation and continuation, and it is important to look at the possible interactions between physical activity and smoking. In speculating how these might be related one needs to keep in mind that the adolescent period is one where adolescents are striving to develop an autonomous self-image (Winkelstein, 1992). Adolescents may start smoking to “look older” and to be accepted by their peers. The investigator also hypothesizes that adolescents believe they can stop smoking at any time and it is only when they decide they would like to quit that they realize how difficult it is to quit. Other factors may also influence adolescents to continue smoking once they have started. For example, with respect to self-image, and body weight, females might not be willing to quit smoking for fear of gaining weight. Both males and females may not quit because of the fear of losing friends. This was evident from the focus group data and is more fully explored in Chapter 6.

A number of factors were identified in this study that may influence the participation or non-participation by adolescents in physical activities. These included: health reasons, lack of time, motivation and energy and encouragement by others. The top two reasons given for not being physically active were lack of time and lack of motivation. The item asking why

adolescents were not physically active was poorly answered (see Table 49 and 50) and no meaningful interpretation was possible. The investigator believes that rewording of the item is necessary in order to make more meaningful interpretations regarding the reasons for the lack of participation.

Encouragement from others and participation of family members and friends is another important influence on participation in physical activity by adolescents (Health and Welfare Canada, 1992). Individuals who encouraged participants to engage in physical activity were identified by participant physical activity status. Because of numerous small cell numbers statistical testing comparing the differences between the level of encouragement by participant physical activity status group was not appropriate. What was noted was that best friends often encouraged participants to engage in physical activities. Generally participants identified that parents at least encouraged them to participate in physical activities occasionally. One difficulty in comparing these data to other national data is that no other studies have classified encouragement of physical activities by physical activity status.

In order to compare the data the results from this study with those of national studies it was decided that the physical activity data in relation to influencing factors would be categorized by gender. Males in this study were most influenced by their best friends and both males and females stated that their best friends were the most physically active. The difference between the proportion of male and female participants identifying that best friends as encouraging them to participate in physical activities was statistically significant, with more males than females reporting that their best friend encouraged them. Similarly, in the "Health of Canadian Youth Survey" by Health and Welfare Canada (1992) differences were also noted between males and females in relation to encouragement to participate in physical activities by

their best friend. This difference is valuable in that health promotion strategies aimed at improving physical activity participation may need to be developed differently for males and females. Involvement of best friends in health promotion strategies for males would be very important. This can not be said for females and other strategies involving the most important reasons for being physically active (e.g., looking good) may be more important to include.

Both male and female groups reported that more than 25% of their parents worked out every week. The results in this study regarding participation by others and encouragement of adolescents by others are similar but not identical to what was found in the national study by Health and Welfare Canada (1992). The national study found that one quarter or fewer of the adolescents reported that their father exercises every week and fewer mothers exercised regularly. In the present study more adolescents had parents who encouraged them to participate in activities than in the national survey.

Family history of heart disease and physical activity status were also compared. Because of inadequate numbers of inactive participants comparisons were done between the moderately active and the very active participants. No statistically significant difference were noted between the number of moderately active and very active participants and whether or not they had a family history of heart disease. It is important to clarify that this does not suggest that heart disease and physical activity are not related, but rather that participants level of physical activity is not based on whether or not there is a family history of heart disease. Approximately one-third of participants did not know whether there was a family history of heart disease and one may speculate that this may account for finding no statistical difference between physical activity status and family history of heart disease.

One might also speculate that not knowing family history may also be related to a lack of interest in “knowing” by the adolescent, the lack of disclosure by parents or societal/cultural norms. It would be valuable to follow physical activity status to identify changes over time in relation to history of heart disease.

Summary

In summary, factors that influence the CVRF of smoking and physical activity/inactivity include peers, health risks or benefits, history of HD in the family, family smoking behaviors and physical activity participation, and may also include factors of self-esteem, body image, and perception of risk. Other factors that have been addressed in relation to influencing smoking behaviors are allowance and adolescent job status. The role of friends/peers, especially best friends for male adolescents, was extremely important in relation to encouraging participation in physical activities. More research is needed with a larger sample size to be able to more clearly differentiate influences in relation to the CVRF of smoking and physical inactivity by smoking status and physical activity status.

Research Question #4: What are the views of adolescents regarding the influence of stress/anxiety on the CVRF of smoking and physical inactivity in themselves and other adolescents?

A number of influences such as family members, peers, perception of risk and benefits have been discussed in the previous section in relation to the CVRF of smoking and physical inactivity. This section will focus on the influence of stress/anxiety on participants. For the purposes of this section, the discussion will focus on the results obtained from the survey regarding: amount of stress/anxiety per week, stressors and responses to stress/anxiety. The findings will be related to participants' smoking status, physical activity status and by gender. It is recognized that stress/anxiety is closely related to other influences and this is further discussed in Chapter 7.

Stress/Anxiety

The term anxiety was initially used in the pilot group, but was subsequently changed in both the questionnaire and the focus group sessions. Stress/anxiety frequency were described in relation to participants' smoking status and physical activity status group. There were no statistically significant differences in relation to the number of times per week participants reported being stressed/anxious based on smoking status groups; it is interesting to note that the majority of participants reported experiencing stress/anxiety 1-3 times per week. Of interest is that all smokers reported some stress/anxiety, but none of them reported experiencing stress/anxiety more than seven times per week. In contrast, 10.5% of the non-smokers and 20.0% of the "tried smoking but quit" smoking groups indicated that they were free from stress. It has been suggested that smoking behaviour is associated

with levels of stress and that as stress levels increase, the likelihood of individuals smoking regularly rises (Health Canada, 1993). There are two concerns when comparing these results: the scales in the studies differ in that Health Canada used a scale from “very stressful” to “not at all stressful”. Secondly, the Health Canada report uses the 1990 Health Promotion Survey and the 1991 General Social Survey results and only reports stress levels in individuals aged 15 and older. These factors therefore make meaningful interpretation difficult since the mean age in this study was 14.1.

Comparison of the number of times participants reported stress/anxiety per week was also calculated by participants’ physical activity status. This method of looking at stress/anxiety is unique and no other references using physical activity status and frequency of stress/anxiety were identified in the literature. Physical activity is often cited to in the literature as being helpful in relieving stress/anxiety. It is important for future investigations to identify the stress/anxiety levels that individuals experience, their physical activity status group as well as the effects of physical activity on stress/anxiety. Although no statistical testing was possible due to low cells sizes it was noted that all of the inactive participants reported at least some stress during the week. No differences were noted between the moderately active and the very active group, with the majority of them reporting being stressed/anxious 1-3 times per week. It would be interesting to do further research with larger samples to see if inactive participants experience more stress/anxiety than participants who are more physically active. There is a great potential for the development of adolescent health promotion strategies that encompass both smoking and physical activity status as well as their relationship to stress/anxiety.

There was a significant difference between the number of times male and female participants who experienced stress/anxiety per week, with females

indicating that they experienced more stress/anxiety per week than did males. This is consistent with the 1990 Health Promotion Survey which reported that teenage girls are more likely to experience stress than teenage boys, and that 50% of teenage girls who report feeling stress will smoke regularly in comparison to those who do not feel stress (Health Canada, 1993).

In relation to the frequency of stress/anxiety, the males who smoked indicated that they felt stressed/anxious between 1-3 times per week and the females who smoked either felt stressed/anxious between 1-3 times per week or between 4-6 times per week. Stressors were identified by participants and were then categorized based on participant smoking status, physical activity status and gender. Homework, exams, classmates, and parents were the stressors most commonly identified regardless of smoking status, physical activity status or gender. No differences in stressors were noted among any of the groups.

Interestingly, females who smoked stated they experienced stress from parents. Seven of the nine females who smoked listed parents as the primary stressor. The difference between male and female participants endorsing "fighting with parents" as a response to stress/anxiety was statistically significant. More females than males indicated that they fight with their parents. Similarly, in the Health of Canada's Youth survey, girls who smoked were often having arguments, or having difficulty talking with their parents and were experiencing difficulty in school (Health Canada, 1996). In the present study, of the females who smoked and listed parents as the primary stressor three indicated that they experienced stress/anxiety between 4-6 times per week. It is speculated that there might be a relationship between the amount of stress females experience and who in particular is associated with causing that stress. It would be important for further research to examine who causes

the stress/anxiety. Research is also needed to identify the adolescent perceptions regarding the influence of stress/anxiety on behavior in order to assist in development of appropriate preventative and intervention strategies.

No difference was noted between participants' mean stressor scores calculated by smoking status and physical activity status. It is interesting to note that inactive non-smokers had the lowest mean stressor score. Intuitively one might expect that inactive smokers would have the highest stressor score. This difference could not be further investigated due to the lack of adequate numbers of inactive participants in the study.

Another important finding was that very active non-smokers had lower mean stressor scores than did participants who tried but quit smoking and those who were smokers. No literature was found that related mean stressor scores to smoking status and physical activity status. The relationship between stressor scores and smoking and physical activity status is unclear at this time. One could speculate that individuals who continue to smoke and are inactive would have higher stressor scores than would individuals who were active non-smokers. The relationship between stressor scores over time would be interesting to follow and would provide valuable information on how risk-taking behavior and stress/anxiety might be associated with each other. Understanding these relationships as they are developing in adolescence is crucial if effective strategies are to be developed to reduce the incidence and frequency of risk-taking behaviors.

As stated earlier the topic of stress/anxiety and the use of smoking as an anxiolytic is controversial. More questions are raised by these results than are answered. It is unclear from the questionnaire data whether or not adolescents smoke to deal with stress/anxiety. What is clear is that physical activity was reported as a stress/anxiety reliever for both the non-smokers

and the smokers, and this will be discussed in the following section.

In relation to activities participants would undertake in response to stressors, they most often indicated that they would do some sort of physical exercise, watch TV, or listen to music, regardless of participant smoking status or physical activity status. The research on physical activity and anxiety has generally shown that activity is associated with both psychological and physical benefits (Raglin, 1997).

It is interesting to note that the major responses by the adolescents to stress/anxiety were either activities that were often done alone (e.g., listening to music) or ones that were physical but also could be done alone (e.g., going for a walk). This was true for both males and females. It will be recalled that males indicated a strong association with their best friend in relation to physical activities. One might expect to see that because males indicated higher levels of physical activities and stressed the importance of their best friend that they might participate in more physical activities during times of stress/anxiety. This was not necessarily the case.

Although friends seem to be very important in other areas for the adolescent (e.g., initiation and continuation of smoking and participation in physical activities) talking to one's best friend was only indicated by 50% of participants as a response to stress/anxiety. As indicated earlier males stated that their best friends were the most important factor in encouraging physical activity, yet in contrast, best friends were only important to 10 of the 26 males in relation to a response to anxiety/stress. For males, best friends clearly play a role in encouraging participation in physical activities but when psychological factors (i.e., stress/anxiety) are involved best friends appear not to have the same role. Perhaps adolescent males believe that they should not show emotion or tell anyone that they are having difficulty with any situation

because they believe they should be able to “handle it”. More females on the other hand turned to their best friend as a response to stress/anxiety.

On further examination it was noted that females generally were more likely than males to endorse responses to stress/anxiety that included talking to individuals. The data regarding responses to stress/anxiety were categorized into a variety of groups that included: communication, potential solitary behaviors, aggressive/abusive behaviors and addictive behaviors, by gender. Differences were then calculated between male and female participants responses to each of the groups. The difference between male and female participants reporting communication as a response to stress/anxiety was statistically significant. The ways in which males and females respond to stress/anxiety are important factors that need to be considered in the development of programs or supports for adolescents. Programs need to be developed in relation to differences in gender but consideration should also be given to other risk-taking behaviors (e.g., smoking, physical inactivity, drug use, alcohol use) that might influence responses to stress/anxiety.

Summary

In summary, in contrast to the national data, adolescents in this study were generally more physically active in both the smoking and non-smoking groups. The majority of adolescents in this study were non-smokers and although many had tried smoking, the majority of adolescents did not continue to smoke. The items on the questionnaire component of the research did not specifically address factors which might have influenced the adolescents' smoking behaviors. However, adolescents who smoked tended to be influenced by friends and family members. Males reported being more influenced by friends than did females. It is perhaps paradoxical, that the smokers who were

close to their friends, and who looked to them for encouragement in participating in physical activities, were the same friends who often were smokers too.

Both males and females experienced varying amounts of stress/anxiety, but all adolescents who smoked experienced some stress/anxiety. Females who smoked appeared to experience stress more often than males and the source of the stress for the females was often related to their parents. It is unclear whether they smoke because they are stressed or they are stressed because they smoke, or whether it is a combination of both. Adolescents experience stress/anxiety due to a variety of stressors including homework, exams, and parents and their responses to stress/anxiety included both solitary physical activities and other individual activities. Friends were cited as causing the least amount of stress for both males and females in all groups (non-smokers, tried but quit, and smokers).

Overall, caution must be used in interpreting these data because of the small sample size ($n = 57$) and in particular the small sub-sample of smokers ($n = 12$). It is important to note that although meaningful comparisons to national data was sometimes difficult because of the sample size, trends similar to the national data were found in the present study. Clearly more research in identifying influencing factors and adolescent knowledge of CVRF of smoking and physical inactivity is necessary. In order to develop effective strategies to reduce risk-taking behaviors in adolescents it is important that further investigation be done to clearly understand the complex and inter-related factors that influence risk-taking behaviors. It is also important that strategies to reduce risk-taking behaviors are broad and comprehensive in nature. Behaviors do not occur in isolation and relationships to other influences such as self-esteem, self-confidence and stress/anxiety may play a major role

in the behaviors. These issues are further discussed in the focus group chapter and the triangulation section of the conclusions chapter.

CHAPTER 6

FOCUS GROUP RESULTS/DISCUSSION

The focus groups were constituted from a sub-sample of adolescents who completed the questionnaire. The sample characteristics are reported in Chapter 3 and demographics in Chapter 4. To summarize, four focus groups were facilitated (1 male only, 2 female only, and 1 mixed males and females). In this chapter the settings of the focus group sessions are discussed, followed by a description of the roles of both the focus group facilitator and the observer. The purpose of this chapter is to present the focus group analysis along with a discussion of the findings. New literature will be brought in as appropriate with the qualitative method of analysis.

Focus group data derived from audio recordings and observations are reported and discussed within this chapter in relation to the themes developed and will incorporate the guiding questions as outlined in Appendix C. It will be recalled that the questionnaire data described and discussed in Chapters 4 and 5 were specific and dealt primarily with the CVRF of smoking and physical activity/inactivity and the influence of anxiety on those risks factors. In contrast, the focus group data dealt with a broad understanding of CVRF initially and then focused on specific information and influences regarding smoking, physical activity/inactivity and the relationship of stress/anxiety.

Themes identified from the focus group data are presented as they relate to the CVRF of smoking and physical activity/inactivity, and the influence of stress/anxiety. Some themes that are more general and cross more than one risk factor are presented at the end of the chapter. Finally, the responses documented from the adolescents in the post focus group session are presented.

Focus Group Issues and Observations

Although data were primarily gathered from the focus group sessions the discussions prior to and following the session were also valuable. The transcriptions in and of themselves were only one part of the focus group sessions. The observations and reflection done were absolutely essential as part of the data gathering and analysis of the data. Information gathered from observations in relation to body language and verbal and nonverbal feedback has been provided to some degree in the body of this chapter. It was difficult to describe the richness and quality of the discussion, because “you had to be there”. The passion and intensity of the interactions was dynamic and exciting. In all of the groups, the cohesiveness and openness of the sessions was something that did not occur until group rapport had been fostered by the facilitator. Once rapport was established the openness and depth of the information that was shared was tangible.

The last portion of each focus group session was filled with disclosure of very personal events and experiences. Participants spoke of such things as personal grief, abuse, neglect, fear, joy, and future plans. The groups did not want to leave at the end of the session. Members of one group in particular mentioned that they felt their discussion was so important to them that they wanted to continue despite other commitments. Many students stayed after the sessions and asked questions of either the facilitator or the observer. At the end of each focus group sessions the facilitator and the observer noted that the excitement, and energy was exhilarating, but the raw emotion, the stresses and the vast trials and challenges that many of the adolescents were facing was exhausting to take in.

As previously defined, *anxiety* refers to a universal, unpleasant emotional state. In the questionnaire results section it was mentioned that during pilot

testing it became evident that not all adolescents understood what was meant by anxiety. Consequently, the term was explained at the beginning of each focus group, and the term “stress/anxiety” was used in the focus group questions; therefore the data on stress and anxiety will be presented together.

Themes

The following sections include the identification and discussion of themes developed from the data (Table 75). The results and the discussion are presented together, because in order to make sense of the data it is important to discuss the themes as they are developed (Patton, 1990). Data analysis and theme identification involved several steps. Initially the data from the transcripts, the facilitator’s and observer’s notes were coded by underlining key words and phrases in the transcripts, observations, and field notes. These words and phrases were identified and restated or paraphrased, then grouped into broad clusters (Miles & Huberman, 1994). The clusters were named and regrouped as appropriate. This process of data coding and recoding on each cluster was repeated in an iterative fashion until the final themes were identified. On reflection it became evident that themes were better understood under the broad classification of “influences on behavior”. Influences on behavior include both cognitive and psychosocial dimensions.

Cognitive dimensions include knowledge and beliefs regarding the CVRF of smoking and physical inactivity. Psychosocial dimensions are based on the adolescent’s stage of development as previously discussed in Chapter 2. The adolescence period leads to the formation of a sense of both individual and group identity (Erikson, 1963; Wong, 1993). The psychosocial dimension incorporates these developing roles and responsibilities in relation to: self; intimate (either family or male/female relationships); peer; authority; and

societal/cultural. None of these categories are mutually exclusive and in fact are more often closely intertwined. A number of the themes cross more than one area (e.g., peer pressure, authority) but for purposes of describing the theme it will be discussed within the category that is most prominent.

Table 75 Focus Group Themes Related to Knowledge and Influencing Factors of Risk-Taking Behavior

<p>Cognitive Knowledge and Beliefs:</p> <ul style="list-style-type: none">• General re Cardiovascular Disease<ul style="list-style-type: none">- Age- Other Risk Factors• Smoking Knowledge• Physical Activity/Inactivity Knowledge• Stressors <p>Influencing Factors: Developing Roles & Responsibilities:</p> <ul style="list-style-type: none">• Self<ul style="list-style-type: none">- Body Image• Intimate Others (family, male/female)<ul style="list-style-type: none">- Intimate Family<ul style="list-style-type: none">- Rebellion- Family Stressors- Intimate Peers• Peers<ul style="list-style-type: none">- General Information & Control Issues- Peer Pressure - Pressure to Conform to the Norm- Need for Acceptance & Being Cool- Physical Pressure• Authority<ul style="list-style-type: none">- Adult Pressure to Perform- Consequences of Pressure- Stressors & Vulnerability• Society/Culture<ul style="list-style-type: none">- Media Influences <p>Influencing Factors: Stress/Anxiety</p> <ul style="list-style-type: none">• Stress/Anxiety & Risk-Taking Behaviors• Stress/Anxiety Relievers

Cognitive Knowledge and Beliefs

The process of cognitive development occurs over a number of years with younger adolescents only beginning to think and reason at the formal operational stage. At the formal operational stage individuals are able to: separate the real from the possible use abstractions, think hypothetically, and think about thinking (Haviland & Scarborough, 1981; Kaplan, 1986; Wong, 1993). In order to assess cognitive knowledge and beliefs adolescents in the focus groups were asked about risk factors for cardiovascular disease (CVD) and influences related to the behaviors of smoking and physical inactivity. Beliefs and knowledge regarding CVRF are presented in relation to: general knowledge of CVD and risk factors, age, knowledge of smoking, and knowledge of physical activity/inactivity. In analyzing the data it became apparent that many of the beliefs and behaviors were related to the cognitive, psychosocial factors and developmental roles and responsibilities as described above. The physiological, cognitive, and psychosocial changes that the adolescents experience can effect how adolescents view themselves, their families, peers, teachers, and their world (Clayton, 1991; Curtis, 1992; Gander & Gardiner, 1981). Because of the extensive overlap of cognitive and developmental roles and responsibilities it is difficult to separate them out entirely. The developmental theory as it related to the themes will be discussed within each of the sections.

General Knowledge of Cardiovascular Disease

Adolescents in the focus groups were asked what they thought kept their heart healthy. They were also asked who gets heart disease and when it starts. In all four focus groups the adolescents were able to clearly identify the risks of physical inactivity, smoking, and dietary habits as affecting one's heart.

One female student in particular emphasized the importance of keeping the heart healthy, “because we need our hearts, ‘cause if we don’t have our heart we die”. There was much agreement with the other adolescents with this statement. All of the adolescents seemed to have a clear understanding of the importance of the heart to survival.

Although on the surface the adolescents could cite many factors that promote and diminish heart health, when more information was asked about the risk factors it became clear in all groups that the actual dynamics of these factors were not well understood. Risk factors for heart disease are taught in a variety of courses within the junior high school curriculum but the adolescents in this study appeared unable to internalize how these risk factors might affect their own health.

The belief that seemed to prevail was that “heart disease, that happens to older people, not me”. This sense of invulnerability was present to some extent in all of the focus groups but a difference was noted with students who talked about people they cared for (e.g., grandparents) who had died because of heart disease or lung problems caused by smoking. These students not only could identify the risk factors but expressed conviction that their loved ones had died because of risks that they had a choice in avoiding. There were differences not only in *what* was said, but in *how* it was said. The tone of the voices of students who had had a family member affected by some sort of health concern was one of “knowing” that risk factors had affected their families. Some of these student’s voices were shaky and they became passionate when they were talking about the effects certain risks had on their families.

In contrast, the other adolescents would speak forcefully about ideas, that on reflection appeared to be the first thing that came to their minds,

perhaps because they had heard it or been taught it somewhere before. Morgan and Krueger (1998) talk about the significance of data provided by individuals who have experienced certain aspects of the issue at hand. Data from experience holds much more weight not only overall, but also has the ability to change behaviors, beliefs and the discussion in the group.

It makes intuitive sense that the adolescents who had close family members die from heart disease would be more aware of the risk factors and as a result not participate in them. This was not necessarily the case; a number of adolescents with family history of heart disease were smokers themselves. A question for further investigation is what factors influence adolescents' understanding of risk factors and how they affect the heart; or why they think that they are invulnerable and that heart disease would not happen to them. In observing the adolescents in the focus groups it appeared to the researcher that many could openly talk about risk factors as they pertained to other people, but had more difficulty relating them to how they affected themselves.

While one student was filling out the questionnaire she talked about smoking at the present time, but stated that she did not plan to continue to smoke forever and so she would not get heart disease. Her plan sounded reasonable, but research regarding quitting attempts, success of quitting attempts, and addiction shows that the longer she smokes the more addicted she gets and the harder it is to quit (Health Canada, 1996).

In relation to the knowledge regarding risk factors associated with CVD the students in the all-female focus groups spent a lot of time discussing the importance of proper diet in order to keep the heart healthy. In particular in one of the female focus group sessions, participants spent the first 40 minutes discussing diet and dieting and the effects on their bodies and, in particular,

their hearts. This group spoke about the importance of knowing Canada's Food Guide and using foods in moderation. For example:

Well it comes back to like moderation. If you know how to just take a little bit and just -- like a little bit of everything won't hurt you. The minute you exceed though, then you're like giving your body something that it's not used to, something that's not really good for you.

Another girl spoke about how to know when you have exceeded the amount the body needs. She stated,

..your body naturally gives you signs of when it's not feeling well. So people should listen to the signs and take them seriously, not just blow them off.

All of the participants spoke about the importance of maintaining adequate and appropriate nutrition. The all-female groups focussed more on the effects of diets on their overall physical well-being and the need to diet. The females in all of the groups were more knowledgeable than males regarding diet and nutrition. For females, diet was closely linked to the theme of body image. Body image is discussed under the theme "Developing roles and responsibilities in relationship to: self".

Overall, males did not seem to identify that they needed to have more knowledge of the risk factors related to heart health. They often spoke about risks but they talked about knowledge of risk factors as it pertained to others and not themselves. Males, like females, spoke about the importance of diet. The difference though, was that males emphasized the importance of diet for females. In the mixed group the males spoke about how females always were so conscious about diet, but stated that this was not an issue for themselves. The males spoke about how females did "stuff" like dieting that was very dangerous and damaging to the heart. When asked about why this was different for females than males, one male stated:

'Cause, I don't know. Guys just don't care. The girls get bugged a lot if they don't look good or... But they don't care too much about themselves, you know, 'cause I know a lot of really skinny and weak guys or really big guys and big muscles or whatever. So like, I don't really care. Sometimes, you know, we joke around about what are you going to do. We don't really care about ourselves,...like about our physical images. What we care about is what the girls are looking like. We bug a lot of the girls if they are looking like overweight or something.

Other risk factors that adolescents identified as affecting the heart included drinking, drugs, lack of adequate sleep and stress. The effects of stress on the heart will be discussed later in this chapter. One female talked about the importance of socializing with other people and interacting in order to feel better. When asked how that would help her heart she stated:

I don't know. It makes you feel happy so that you want to do other stuff. And then that way if you're happy, then you will go and you will eat healthy and you will exercise and stuff. ... 'Cause then you feel more free to actually take care of yourself.

This statement may also be related to the area of self-esteem. Feeling "good" about oneself was emphasized as being important to overall health, but it also related to being with others and being part of the "group". Adolescents are extremely sensitive to others' opinions and to criticism and adolescents' feelings of self worth and positive self-esteem are important to their mental health, social relationships and can be related to risk-taking behaviors (Boyd & Hrycaiko, 1997; Clayton, 1991; Curtis, 1992; Gander & Gardiner, 1981; Dielman, Campanelli, Shope, & Butchart, 1987; Gauvin & Spence, 1996; Rice, 1984).

A number of adolescents in the focus groups talked about stress and the negative effects on the heart. For example:

...Like when you're anxious it's not necessarily good for--'cause it gets the blood pumping faster and you start to worry and just your emotions and it's just not good for you. And it's not good for your heart to put it through all of that. Like it's stress on the

heart too when you're constantly stressed out or anxious. It's not good for your heart.

Stressors identified are discussed in more depth under the roles and responsibilities in which they best fit.

In relation to heart disease adolescents in the focus groups were asked about who gets heart disease, and when it starts. To one male, it was,

The people that go -- that do smoke and do drugs, that don't really care about themselves and don't exercise or they just don't care enough.

In summary, some of the general risk factors associated with CVD were identified and discussed by participants. Data suggests that adolescents have some basic knowledge regarding CVD, and can identify how risks may effect others, but do not necessarily see it affecting themselves. The focus for females centred around the impact of diet as it related to losing weight and maintaining an "image", not how diet was related to heart healthy eating. In contrast males did not identify diet as a risk for them but also identified it as important for females.

Age

In addressing the area of CV health and general knowledge of risk factors it became apparent that adolescents have some preconceived ideas about who develops heart disease and when. The issue of age was therefore identified as a sub-theme under knowledge of CVD.

All focus groups members talked about heart disease as happening to "old people". "Older" to one group was anyone over 34 years of age, while to two other groups "older" was being over 45 years of age, and to the fourth focus group older was being between 45 and 50 years of age and older. When

asked why people of this age get heart disease one female stated: "Cause their hearts aren't as fresh anymore". Another adolescent spoke about heart disease also being genetic or being present in premature babies.

In relation to age, the literature does support the adolescents' view about heart disease happening to older people. However, there may be differences in definition of "old"; some adolescents perceived "being old" as anyone over 34 years of age. In fact, HD most often occurs at age 50-60 years and above for men and at age 60-70 years for women (Tierney, Mcphee, & Papadakis, 1995). HD can affect individuals, especially males, early in life (e.g., 30-45 years of age), but this is not the norm.

Although most adolescents spoke about heart disease affecting people later in life, they did speak about the development of heart disease as beginning much earlier, and they were able to make a link of long-time exposure to increased risk. One adolescent female spoke about heart disease starting:

..usually in teenagers because teenagers are usually the ones that are so like peer pressured into smoking and like, so worried about their weight and stuff from other kids around them. They'll like be the ones most likely to be anorexic and stuff.

Another female stated:

It can start from when you're around your teen years and it can go on till then 'cause it can happen any time of your life because if you don't keep yourself in a decent condition, that you're going to be at risk for these things, and if you abuse your body with alcohol and smoke and smoking and definitely drugs, you can definitely put a stress on your heart and you can get heart attacks and stuff.

This participant's comment closely reflects the evidence from the literature, in that it has in fact been demonstrated that symptoms of heart disease usually do not occur until there is significant blockage of the coronary arteries, but a

fatty streak or atherosclerosis has been shown already to be present in infants greater than 1 year of age (McCance & Huether, 1998; Woods, Sivarajan Froelicher, Halpenny, & Underhill Motzer, 1995). Participants in all of the focus groups spoke about the habits that they formed early in life and how these habits may affect them later in life. This is illustrated in the following quotes:

Female: I think a lot of older people don't realize when they come down with problems, like a heart disease or stuff. Stuff like that, they don't necessarily realize that the choices they made when they were younger will affect them now. Instead they're trying to -- they're asking questions, what do I do now? ... And it's kind of too late. I mean, what matters is what you did before when you were younger and you were not quite as knowledgeable of what can happen to you and I think they really need to realize that what they did before is what's going to affect them now.

Female: The starting of it and because if you start at a young age and think, well it's not going to affect me and have that attitude, then as you grow older that's going to stick with you and then you're going to keep in the same habits most likely, without changing and wanting to change. So when it starts younger it's just going to grow as you grow and then by then it will be too late. And you might not be aware of it now, but as you grow older and things become worse on your body, then the effects are going to be surprising.

Other Risk Factors

The adolescents also generally categorized people who were obese as being at increased risk of heart disease. For example, one female when asked about who gets heart disease said:

Well, most people with, like obesity or something, because like they have so much cholesterol that clogs up and then it interferes with their heart.

Although obesity can be related to other risk factors that lead to heart disease, obesity by itself is not an independent risk factor for heart disease

(McCance & Huether, 1998). For instance increased cholesterol, and low density lipoproteins (LDLs) often accompany obesity. Only one female related other factors that may lead to heart disease in an individual who was not obese, such as having a high intake of sodium and cholesterol. One male spoke about the multifactorial risks that can be associated with heart disease. He stressed that it could happen to anybody, but that there may be a relationship between what risk factors an individual might have. He went on to state:

You've just got to watch what you do. If you don't exercise, you don't eat properly, you smoke and do drugs and all that, you could die when you're 15. But if you smoke a lot and that you'll probably die before most of your friends that don't.

In general, on a superficial level, the adolescents in the study appeared to understand that what they did now might affect them later in life. What was paradoxical was that at one point they talked about how things that they do might affect people later in life, while later they were not able to see that what they do (e.g., smoke) or do not do (e.g., are physically inactive) themselves is related to HD for *them* in later life. Their comments were often outcome or consequence oriented. On the surface the investigator believed that they did understand the implications of their behaviors, but many of them did not see themselves as continuing in risk taking behaviors and therefore they would not be at risk later on for heart disease. Heart disease was something that happened to someone else "out there" but not them. Other factors that might influence why they participate in high-risk behaviors are discussed further in this chapter. One adolescent spoke about the difficulty in breaking a habit once it is started.

Female: It's the habit I think, that once you start a habit and I mean it's a lot easier to just avoid it than it is to actually break the habit.

This quote is one that the investigator believes is very significant and does show some real insight by the adolescent into the consequences of risk behaviors.

Smoking Knowledge

Adolescents spoke openly regarding the effects of smoking on themselves and others. All groups mentioned that smoking was associated with lung cancer and that often people who smoked had a harder time breathing. Adolescents in the focus groups were able to identify that smoking was a factor in heart disease, but they were not clear regarding how smoking led to an increase in heart disease risk. Adolescents clearly associated smoking with a possible change in physical activity tolerance as can be seen by the following quotes:

Male -You can't breathe as well. You're less active -- you're less active and when you are less active then problems will start coming soon. And then you can't do the exercises like everyone else.

Female - I guess there are exceptions. There are some people who smoke and still are fine and participating in sports, but for the majority of them smoking just takes away from their energy levels, like they're short of breath and that kind of -- it causes them to just figure why bother when I could just stand and have a smoke.

Although most adolescents did not appear to have a clear understanding of how smoking directly affected the heart, they were more aware of the effects it had on breathing and the development of cancer. One male adolescent directly linked the smoking to lung compliance and as a result affected the heart's ability to sustain adequate oxygen levels. He stated:

The -- like one of us said, that cigarettes and stuff clog up your lungs

and then if you can't get enough oxygen, your heart has to work harder to get the blood and oxygen to the rest of the body with less oxygen. It has to get more blood to your lungs to get oxygen, so if it's working harder it just get -- a major strain on it.

As can be seen by the following quote, smoking by one female student was associated with an increase in potential heart problems if the individual was active.

Well, if you smoke, like you could have -- yeah, you can have problems with your heart, if you do physical activity you can like -- it can hurt your heart.

It is interesting to note that the quote above suggests that physical activity done by an individual who smokes may actually be detrimental. In fact, exercise will improve the level of high density lipoproteins (HDLs) which often decrease when an individual smokes (McCance & Huether, 1998). An increase in HDLs will increase the HDL/LDL ratio, which has been associated with decreased risk of CAD (Heart & Stroke, 1997).

In the male only focus group there was discussion regarding the changes in cigarettes over the years. A number of participants in the group spoke about how smoking was much safer now than it was in the past. One male stated,

Well, like cigarettes and stuff now they have the filters on the end so they're better than they were before they had the filters.

This quote is just one example that demonstrates how effectively advertising agencies have promoted misinformation regarding smoking, particularly to adolescents. Cigarettes in Canada do have filters that provide some filtering of toxic agents. These micro filters are not visible to the naked eye and are usually blocked by the smoker holding the cigarette. However,

environmental tobacco smoke (ETS) has higher concentrations of toxic and cancer-causing agents than the mainstream smoke inhaled by the smoker (Heart & Stroke Foundation, 1995). So not only the smoker, but all those close to the individual who smokes, are inhaling the harmful ETS. Clearly, cigarettes are not safe and debunking myths associated with cigarettes and smoking needs to be part of health promotion strategies for adolescents.

Adolescents stated that smoking habits were different for each individual and that the health effects also depended on the individual. This statement is accurate in that everyone responds differently to different factors, but no matter who the individual is, smoking increases risk of CVD (Heart & Stroke Foundation, 1997), and females who are heavy smokers and use oral contraceptives are more than 20 times as likely to have an acute myocardial infarction (Heart & Stroke Foundation, 1993).

In relation to smoking and physical activity in this study, those individuals who smoked only a "couple" of cigarettes per day did not necessarily have any change in physical activity, and in fact told us that they were very active. One hypothesis may be that the adolescents believe that if they can smoke and still do physical activity, then smoking is not harming them. One female adolescent stated:

It depends on the person. Everybody's different. Everybody -- some person's body may be able to handle smoking and remain fine, while other people's body may just -- they just can't take it or the person's not willing to push themselves to make both of them work if they're not willing to give them up.

Overall the focus group members did appear to be physically active. As noted earlier the students were informed at the beginning that they could talk about themselves or they could talk about adolescents in general. Therefore, during the focus groups the facilitator and observer did not know

who if anyone in the group was a smoker unless they openly admitted it, and because of this when individuals talked about being active it was difficult to establish if the person was a smoker or not.

Adolescents in the focus groups spoke about smoking because other adolescent friends smoked. They talked about it being temporary and that it only leads to problems if it becomes a habit and if they continue to smoke into late adulthood. They spoke about addiction as it occurred with others but not as something they needed to face at this point in time. This is a concern since the literature points to the fact that the sooner a person smokes, the more chance they have of continuing to smoke, and the more they continue to smoke the more chance they have of becoming addicted (Morbidity and Mortality Weekly Report, 1998). Health promotion, program planning implications include the need to address the knowledge of how and when smoking affects individuals. Other program planning needs to focus on assisting those adolescents who want to smoke but are addicted.

Physical Activity/Inactivity Knowledge

Adolescents spoke about the importance of exercise in maintaining overall health. The majority of participants stated that they believed they were very active and that this was not a problem or a concern for them. In contrast one female, when asked about whether or not most young women at her age were fairly fit and active in sports, stated:

I don't know, .. Like lots of my friends they'd rather go home and watch like Days of Our Lives or I don't know, something, other than do stuff (exercise).

As mentioned earlier, appearance was very important and was related to both diet and exercise. This section will highlight only a few examples as they relate specifically to physical activity.

Females in both of the all-female focus groups spoke about the importance of maintaining activity not because it made them physically healthy but because it made them look different. For instance, one female stated:

I think they're (females) are more self-conscious about how they look because of the guys they want. You hear more about the girls who actually take that [being told they are overweight] and tell themselves that it's time to lose weight, or time to change and fit in.

Females in both groups spoke about losing weight by dieting and not by physical activity changes. Females consistently spoke about the importance of not being overweight and doing something about it because of the psychological need to "fit in". One female stated:

I think most of them try to because now like if one person is like overweight they don't fit in as much, like they try to all look the same and you don't want to be the one who's overweight, you want to be like your friends. And if your friends are doing sports, you want to go along and have fun. That is basically all the stuff you do.

Adolescents spoke about participating in physical activity as a way to "fit in". Research on physical activity has shown that it can contribute to improvements in self-concept and self-esteem (Calfas & Taylor, 1994; Folkins, & Sime, 1981; Gruber, 1986; Sonstroem, 1986,1984; Waldron, Lye, & Brandon, 1991). By participating in sports and activities the adolescents are improving their health both physically and mentally. It should follow then that adolescents who were overweight and did not participate in physical activities would have lower self-esteem and self-concept. In studies, the duration and type of physical activity (aerobic versus non-aerobic) citations varied and it is unclear whether all types of physical activities enhance self-esteem. More research looking at specific types of physical activities and the affect on self-esteem and self-concept is needed. It would also be important to compare a variety of

physical intensities and physical activity durations.

Males in the focus groups spoke about the importance of regular exercise to maintain health. Discussion regarding specific activity levels occurred in two of the focus groups. One girl spoke about the perception of others regarding adolescents' activity levels today. She stated:

Like I heard that on the news and just from my parents too, that this generation is a lot more overweight 'cause there's so much new technology, like internet and T.V., and video games. People want to do that more than having fun and having -- like being fit and stuff 'cause you have to work to be athletic and stuff like that.

Many adolescents disagreed with this and stated that many of their friends had club memberships or were really "into" sports. One female stated that she did not feel that girls her age were unfit because they were not overweight and they did not have heart problems. She felt that just because they did not "work out" did not mean they were unfit, because they had other ways of keeping fit like walking to the mall.

The perception of what was "being fit" was intriguing. Many adolescents believed that if people were not "fat" they were fit. In fact, body composition is not a good predictor of whether or not someone is physically active or fit (Pate, et al., 1995). Although individuals who are obese are usually inactive (Bouchard, Depres, & Tremblay, 1993), it does not follow that people who are not obese are active and fit. The meaning adolescents give to "being fit" is one that warrants further investigation.

In summary, the participants were able to identify the major risk factors for CVD, but did not always clearly understand how these risk factors affected their heart. Beliefs about heart disease and risk factors were explored. Beliefs about heart disease were sometimes based in reality (e.g., the older the person

the more chance of having heart disease), while other times the beliefs were mythical or based in false realities (e.g., if people were not “fat” they were fit).

Stressors

Adolescents identified a number of stressors that they felt influenced the CVRF of smoking and physical activity/inactivity including: need for acceptance, family, self-image, teachers/school. It was impossible to identify a simple linear cause and effect relationship between stress/anxiety and smoking and physical activity/inactivity behaviors. Effects were not uni-directional, in that behaviors could lead to stress/anxiety, but stress/anxiety could also lead to changes in behavior. Moreover, it was impossible to separate out the stress/anxiety from the behaviors, therefore stress/anxiety will be discussed as it relates to roles and responsibilities.

Stress/anxiety was not always seen by the participants as being negative, as it could mobilize the individual into action. At other times, anxiety immobilized the adolescents and they were unable to do anything. Adolescents also discussed positive self-esteem and exercise as stress relievers. These will be further described in a later section.

Influencing Factors: Developing Roles and Responsibilities

The roles and responsibilities of the adolescent are complex and intertwined. In order to describe the themes from the data in relation to CVRF, the data were coded and organized into categories under the broad theme of developing roles and responsibilities and included: self, intimate others (family or male/female relationship), peers, authority and society/culture. It is important to note that although themes in each of these areas will be covered separately, there is tremendous cross-over among themes and they should not be viewed

as mutually exclusive.

Cognitive maturation is one aspect of development in adolescence. Cognitive ability does influence other aspects such as the development of specific roles and responsibilities of the adolescent. Erikson (1963) describes eight stages of human development in which an individual has a psychosocial task to master (see Table 76). During adolescence the task is one of achieving identity versus identity diffusion or role confusion (Erikson, 1963; Haviland & Scarborough, 1981; Rice, 1984; Wong, 1993). Kaplan (1986) states that the search for a personal identity occurs as the adolescent works through the transitional stage between the simpler elementary school years, and the responsibilities of early adulthood. Although achieving identity is the primary psychosocial task during adolescence, this task is a lifelong process that has begun much earlier in life and will continue into adulthood. Identity formation merely comes to the foreground during adolescence.

Table 76 Stages of Psychosocial Development & Tasks

Age	Psychosocial Task
Infancy	achieving trust versus mistrust
Early childhood	achieving autonomy versus shame and doubt
Play age	achieving initiative versus guilt
School age	achieving industry versus inferiority
Adolescence	achieving identity versus identity diffusion
Young adult	achieving intimacy versus isolation
Adulthood	achieving generativity versus stagnation
Mature age	achieving ego integrity versus disgust, despair

(Erikson, 1950; Rice, 1984)

Adolescents face physical, sexual, and cognitive transformations, as well as major changes in personality and social behavior. These changes are often influenced by parents, other family members, intimate relationships, peers, authority figures and society and culture (Gander & Gardiner, 1981; Gullotta, Adams & Montemayor, 1990; Kaplan, 1986; Shantz & Hartup, 1992).

Self

Adolescence is often a time of rapid physical, and psychosocial change. During this time the adolescent is also struggling to achieve an identity. Adolescents develop a sense of self through a process of evaluating their own experience and by receiving feedback from others (Jackson & Bosma, 1990; Kaplan, 1986). This development of self is referred to as self-concept, while the value that individuals place on certain aspects of the self refers to self-esteem (Kaplan, 1986). During the analysis of the data from the focus group sessions body image emerged as one aspect that was very important in the development of "self" or identity and it is discussed in this section.

Body Image

Very closely related to self-concept is body image. One of the tasks of the adolescent is to understand and to learn to accept one's changing physique (Gander & Gardiner, 1981). This task is one that many adolescents, especially females find very difficult. Body image, or how we see ourselves can have an impact on social relationships, school performance and acceptance by peers (Gander & Gardiner, 1981; Kaplan, 1986). Body image can also be associated with potential risk-taking behaviors.

Body dissatisfaction and image are important factors especially for adolescent females (Wertheim et al., 1997). Researchers have reported that

up to 50% of adolescent girls have dieted and more than 50% would like to be thinner (Huon, 1994; Rosen & Gross, 1987; Wertheim, Paxton, Szmulker, Gibbons, & Hiller, 1992).

A number of girls in the focus group sessions spoke about being on diets themselves. One has to remember that these students are from Grade 9 and are approximately 14 years of age. None of the girls in the all-female groups appeared obese or even overweight. Of course all of them were in different stages of development but it was disturbing to the investigator to hear some of the girls talk about the importance of dieting. Diet and nutrition were terms used together but the sense when listening and watching what was being said was that diet was important for image and "looking good" and did not necessarily mean keeping healthy. Keeping healthy was a bonus but outward appearance was more important. Thus, what the females were saying was that they were knowledgeable about dieting (for weight loss and image purposes), but this did not necessarily translate to eating a heart healthy diet. This is an important difference that must be addressed. The girls might not have been overweight but they could have been malnourished and not eating appropriately. Being overweight or being malnourished and not eating appropriately both affect the ability to keep one's heart healthy.

One of the all-female focus groups extensively discussed the effect of eating disorders. They spoke about friends who had eating disorders. One participant stated,

And like people, like eating disorders and people -- anorexia or bulimia and that. That's not good for you because with anorexia when you're starving yourself you're lacking your body of all the nutrients and the nutritious part that it needs to survive and function. So by starving yourself you're lacking it of that and so it's going to result in future problems.

When asked whether or not dieting was a problem and whether or not it

was the same for both males and females, one girl stated:

Because it's probably most of the guys don't -- wouldn't really care, like their weight and stuff and most girls do. And guys are usually the ones that go around going oh, yeah, this person's fat, blah, blah, blah, and then like you hear it going around and then it's like in your ear that you'll have to lose weight.

This participant suggested that girls diet to "look good" for the boys. Other females were then asked if they agreed with this. The response was strongly positive; they said they needed to diet to look good, not necessarily for the boys, but for themselves. There was a clear difference in the girls' responses regarding this issue. Some girls spoke about being comfortable with "who they were" and "how they looked", while one of the girls in the same group spoke about how important it was to dress and look right when going to parties. This girl was wearing tight-fitting clothes, and looked older than the other girls in the group. She wore a lot of make-up and bright nail-polish, which suggested to the researcher the need of the teen to "make an impression", or to "be noticed". Self esteem appeared to be one of the issues that girls in this age group were trying to deal with, with varying degrees of success. An adolescent who has a positive body image is more likely to have or develop a positive self-concept and self-esteem (Gander & Gardiner, 1981). Self esteem is an important issue that comes through in a number of the themes in this chapter and will be covered within the context of those themes.

Both males and females in the focus groups talked about how personal image affected them and caused them stress. For instance one female stated: "Like, if you were going to a party or something, and you're new or trying to impress people, you'd be like trying to look good and stuff". Other females spoke about how they felt they needed to look older so that they could be accepted by the opposite sex.

A lot of people, a lot of girls anyway, think -- thought if they smoke it makes them look older. It makes them look older, and more mature than they really are, because you'd think that you'd have to be old enough to like, I don't know, buy the smokes or kind of just use them. People would figure that you must be older.

They'll try and look older so that like the guys will fall for them or something. Like, say, like go to the mall and you're sitting there in the food court smoking or whatever. They think like the guys will be attracted to you or whatever.

In contrast, another female in this group disagreed with smoking and whether or not those who smoked attracted attention. It really depended on the individual that the females wanted to attract and the image they wanted to portray. She stated :

Depends on what kind of guys you're looking for though. If you want the attention from the other smokers then of course it's going to work. But if you want the attention from someone who doesn't care -- maybe he had tried smoking but doesn't really care for it, then it kind of -- what kind of attention do you want to get? You can either get attention from a certain group of people or another group of people.

Adolescents also spoke about the importance of self-esteem and image. People with higher self-esteem were, according to the adolescents, more liked. They stated that it was not easy to improve self-esteem because of the pressures they faced. One female spoke about the importance of really looking at a person and not the outward appearance:

So like, girls are only supposed to like, be all girlie and all you have long skinny legs and like, thin and like, have cleavage, wear pretty stuff and wear make-up. And then there's like -- and the guy image is like a good looking hunky kind of guy. And all of those guys will go, wow, when you walk by. And the truth is that nobody is really like that, like even -- like all those models and stuff. You take off all their make-up, and take off all, like, the designer clothing..."well you don't want to take that off". But if you get rid of it, then it's not...like, then they're just like a regular person again and that the role maybe of a supermodel and stuff is

ridiculous because none of it is real.

As previously discussed research has shown that self-esteem is a factor that can influence risk-taking behaviors. How adolescents see themselves and how they see others will influence their behavior (Kolody & Sallis, 1995; Sands, Tricker, Sherman, Armatas, & Maschette, 1997). The findings of this study supported the previous findings that self-esteem and image were important in adolescence and could have an influence on behavior.

Intimate Others

Close or intimate relationships exist between children and their parents and family. Children look to their parents for their emotional needs and acceptance and love (Rice, 1984). These relationships begin to shift in adolescence, in that parents and family relationships often are sources of conflict. Physical changes, sexual maturation and the need for independence makes the adolescent turn more to peers to find the support previously provided by their families (Rice, 1984). Developing relationships include both intimate relationships with family, and with peers. A number of subsets that impact the intimate relationships with family include family stressors and rebellion and these are discussed within this section.

Intimate Relationships - Family

The family is a powerful influence during childhood and adolescence (Kaplan, 1986). The role of parents changes in adolescence with the adolescent striving for more independence. Another dimension involves affection and respect for parents (Gander & Gardiner, 1981). In analyzing the focus group data it became apparent that the family played an important role for the adolescents. Smoking in particular was used as an example of how the

family had influence on adolescent behaviors.

Adolescents in all focus groups spoke about the influence of family members on the initiation or continuation of smoking. Most participants believed that if the parents smoke, then the chances are higher for adolescents to try and possibly start smoking regularly. One female participant stated:

Well, like, just if like a parent smokes, like your mom or your dad, and you're always around them, you just get used to it so when you start smoking it's just like, no big deal 'cause you're so used to it.

Another male adolescent stated:

Like the kid may think that it's okay 'cause you know, mom and dad do it, so it must be good.

Others felt that just because parents smoked, adolescents would not necessarily take up smoking. One male noted,

But I disagree though, 'cause they might see that maybe their parents aren't so great with smoking and that, maybe they might see that it isn't the thing to do. Maybe they can see that all they do now is just cough, they have a bad heart, nothing's going right so this is what they do. They might think, well, look, I see my whole life ahead of me, why would I screw it up with this.

Thus, the influence of family was seen as dependent on the nature of the relationship. Some students felt that adolescents may be more likely to try smoking when parents smoked; others believed that the opposite may be true depending on the relationship the adolescent had with parents. An association with parents' smoking behavior has been consistently reported in the literature (Health Canada, 1996; Hover & Gaffney, 1988; Michell & Amos, 1997; Nolte, Smith & O'Rourke, 1983). Nolte, Smith and O'Rourke (1983) found that girls in particular were more likely to start smoking if their mothers smoked. Therefore it is important to consider both the family history of smoking, and the relationship that the adolescent has with the parents or other family

members. Not all adolescents smoke even though their parents do, and it is just as important to understand why they have not started as it is to understand why others have started. The relationships between the parent and the adolescent and the adolescent and other peers appear to be important considerations in understanding why or why not an adolescent would initiate a smoking habit.

Other factors that the participants identified as being related to whether or not a adolescent might try smoking, included strictness of parents and curiosity. One member of the all-male focus group stated parents were less strict with adolescents when they (the parents) were separated and the adolescents could do whatever they wanted. Adolescents may be more curious about experimenting with smoking when they are not exposed to parents who smoke. One female stated:

Then again if your family doesn't smoke you're more interested in finding out what it's like and you haven't seen the like -- the results of smoking.

Consistently all of the focus groups had adolescents who referred to their parents as "out of touch" and not knowing what was going on. Many adolescents did not believe that their parents ever smoked or used drugs. It is interesting to note that in the questionnaire data 50% of adolescents had no one in the home who smoked and 50% did have some family member who smoked in the home. Therefore the participants who talked about parents and whether or not they smoked, may have been the non-smokers from the group. One male stated : "My parents came from like a little town so there was none of that stuff..". While another male stated: "Like, you don't hear people from the '40s in the big city doing pot".

In one of the all-female focus groups there were differences of opinion. Two females, when asked who would have an important influence on them,

stated their parents because as one put it: "it's a respect thing". Two other females had a different perspective. One stated:

Like my friends know more than like my mom does. Like I'll talk -- I think I'm closer with my friends than with my family. I can tell them a lot more. Like, they're more understanding 'cause like, they're with me or whatever and they know, like how things work in the '90s or whatever. And there's my parents, and then they're so behind and they don't understand anything"!!

A number of the participants spoke about why they and their parents were so against smoking. The influence of past health problems of family members is not well documented in the literature, but may be an important factor in determining whether or not smoking is initiated or continued. One male adolescent related part of his family history and stated that this was what influenced him not to start:

I have three of my grandparents that are dead. Two of them are dead directly 'cause of smoking.... They had lung disease and stuff. And my grandma when -- when she -- I remember when I was like six or something she had to take a ventilator around with her 'cause she smoked and a couple years later she dies. And my dad is really [voice shaking, very emotional]--'cause his mom died of cancer or lung cancer. He really does not want us to smoke. Like he sees somebody smoking walking down on the street or something he says, well, those stupid guys. Especially like parents, like he sees somebody smoking in the car with like, this three-year old next to him. He says, geez, look at that stupid idiot.

Participants also talked about other family members such as siblings and the influence they had on them to start or not to start smoking. Some felt that siblings had an influence but others did not. Overall those who felt siblings had an influence stated that the siblings were always older. One female stated:

My brother and sister because, they're like, older than me, and I'm like, you guys are like, wicked kind of, and then I want to be like them. So I try to kind of do what they do.

Similarly, one female spoke about her older sister as having the greatest influence on her.

I look up to her, and I -- she's like -- like when I have a problem to deal with, she's the first person that I go to talk to. And if I have problems with my friends or something she'll be willing to talk to them for me and stuff.

In the mixed males and females group or the males only group, the males did not refer to their siblings as having any impact on influencing any of their smoking behaviors. Researchers have generally investigated the influence on smoking behaviors, in relation to having smoking parents or others in the home. The relationship of adolescent smoking behaviors has usually been seen to be associated with parental smoking behaviors, but can also be affected to a lesser extent by others smoking in the home (Health Canada, 1996). The findings of this study in relation to parental smoking behaviors were similar to those in earlier studies.

As noted earlier, parental influence and support on smoking behavior is variable and perhaps depends on the quality of the relationship between the adolescent and their parents. Family and friends have been shown to be role models for others in relation to smoking behaviors (Health Canada, 1996; Health and Welfare, 1992) and family and friends have also been linked to participation in physical activities (Health and Welfare, 1992; Pate, et al., 1995).

Parental influence was also evident in relation to overall responsibilities of parents. Participants in the focus groups spoke about parents who influenced them to maintain their fitness levels. One female in particular spoke about the parent's responsibility to make sure that they ate "right" and remained active.

They had that thing a little while ago about some girl that was like our age or something that died from being so overweight. She was like 250 pounds or something, and that's kind of her parent's responsibility too.

'Cause if she didn't know that it's not right to be overweight, then she just would think she's kind of normal.

Another girl though disagreed with parents having to be responsible and stated:

Yeah, I just get it (information) for myself 'cause I don't really depend on my parents. I don't expect them to tell me to like, I don't know, like my mom sometimes tells me to like go work out or whatever, but I don't really expect her to because I think I'm old enough to make my own decisions.

Families and parents in particular play an important role in the social development of adolescents. Issues such as rebellion and family stressors can influence adolescents' development either positively or negatively. Data related to these specific areas will be briefly described since they can have an effect on risk-taking behaviors.

Rebellion

Achieving emotional independence from parents and other adults is a developmental task of adolescence (Gander & Gardiner, 1981). In an attempt to gain independence from parents, adolescents often desire to do things with friends without seeking permission, and react negatively when parents or others try to assert authority over them. As development progresses, parents and adolescents both face an authority crisis (Rice, 1984). Parents who have been in control of their children for years may suddenly feel that control slipping as adolescents strive for independence (Rice, 1984). In the struggle of both parents and adolescents to maintain some sort of control, conflict and "a battle of wills" often occur. Adolescents during this challenging period are often said to be rebellious.

During the focus group interviews it became apparent that the

adolescents in this study were striving to be independent and in order to gain independence they often conflicted with parents. This conflict often ended up in conscious risk-taking. Students in all focus groups stated that they often did participate in certain behaviors such as smoking or not doing what their parents wanted in relation to sports just “to be a rebel”. Examples of this are:

Male: I think people mostly smoke because basically they're not allowed to. Like right now the whole point to being around right now is that -- to not do what parents want, but to do what everyone else wants us to do. So it's just -- no one wants them to smoke, so they smoke just like to show that, yeah, we can smoke. We're our own person, we're independent of the rest of you.

Female: .. It is a rebel thing because your parents are saying, oh, don't smoke, it's bad for you, and then you don't really -- you're not on the same wavelength they are, so you think, oh, well. I'm just going to do it because my parents don't want me to. And I want to try it. And if maybe they were not nagging on you so much you'd have a different perspective of it.

Adolescents spoke about going against their parents' wishes because it was the thing to do and it was expected of them. One female talked about doing the exact opposite of what parents and others (e.g., teachers) wanted. A number of students stated that they intentionally tried to find out what really bothered their parents and then they would go and do it, just to see their response.

As can be seen by the following statements, some adolescents felt “cool” or had a sense of “pride” when they did things they were told not to do.

Female: Like, so she was like, only doing it so that she could go against her mom's word, or whatever, and try to feel cool 'cause she is disobeying her parents.

Female: I think it's more -- the more you tell someone you can't do something the more they kind of feel that it's -- what would it be like to

just get away with it. And they know like, having them tell you something, not to smoke or whatever and you -- behind their back and you go behind their back and smoke. It kind of gives you a sense of like, I don't know, pride that you got away with it.

It was noted in the focus groups that the adolescents talked about doing things "just because" with a sense of pride. It was as if they enjoyed it. It makes sense that adolescents enjoyment may be related to a sense of accomplishment in being independent, since this is what they often are striving for. Rebellion may lead to other risk-taking behaviors. Smoking, which is a form of rebellion to many adolescents, is often associated with other high-risk behaviors such as drinking, drug abuse, risk-taking and early sexual activity (Pate, et al., 1995). Adolescence is clearly a time of turmoil, transition and adjustment. Clayton (1991) found that boys and girls differ in relation to understanding why they smoke. He hypothesized that boys used smoking as a way to cope with social insecurities, while girls who smoke are more likely to be rebellious and independent. Because of the small sample of adolescents, especially males in this study, who continued to smoke it was difficult to support or refute what Clayton found. Other authors question whether or not smokers are more self-confident, and they report psychological factors such as increased stress, decreased self-esteem and coping skills as related to increased adolescent smoking (Bonaguro & Bonaguro, 1987; Dielman, Leech, Lorenger, & Horvath, 1984; Murphy and Price, 1988). These conflicting results may be due to the fact that different investigators are failing to take account of the adolescents' stage of smoking at the time of the study. Different results would be expected from adolescents in the stages of initiation, experimentation, regularization, or habituation as discussed in Chapter 2. Instead of just labelling adolescents "rebellious", it is important to understand why adolescents are doing what they are doing in different stages of development and how this

in turn relates to participation in behaviors. Factors such as gender, cultural differences, and other influencing factors such as stress/anxiety, and other risk-taking behaviors also need to be investigated further.

Family Stressors

Data analysis revealed stressors related to adolescent development and family relationships. All adolescents in the focus groups talked about parents as stressors. These stressors focused on unrealistic expectations, performance, and relationships. For example:

Female: like you have to -- like to be accepted, I don't know, by your parents, they have such high expectations and stuff. Well at least mine do. And like, you have to get good marks on all your tests and you have to be a good student and you have to be like a nice person and have all these after school activities and stuff like that.

Female: I think like parents these days, like expect too much from you. I don't think they understand like anything that's going on at school, like peer pressure or anything, I guess. Do you kind of know what I mean? They don't know -- 'cause I'm not -- I'm really close with my mom but I wouldn't tell her things like that, like if I tried smoking, I would never tell her that. And then if I don't tell her then I guess she doesn't understand and then -- so I think that's how the problem starts building up.

Female: Well, like in my family I do absolutely every last thing wrong. Like -- and it's like my parents think everything's wrong! (Adolescent was very upset as she talked. Her voice was raised and she turned red in the face as she talked. As she talked other females were also nodding their heads to what she was saying).

In relation to the last statement, other females in the room identified similar experiences with their families. Several perceived that nothing they could do was right. Adolescence is a time of change, challenge and growth in all aspects of life and frequently emotions and sensitivity levels are extremely high

(personal communication, Dr. A. McKeough, Department of Educational Psychology, Dec, 1996). Physical and hormonal changes may also contribute to the fluctuations in emotions.

Adolescents identified independence as one of the stressors related to family relationships. For example one male spoke about being told to be independent and then being told what to do:

I know it's like -- my dad he's like, well, I would like to see you go to university, but if you don't that's okay. Except I would still like to see you go. I don't care what you be just as long as you go to university. It's like let me do what I want to do!

Other adolescents spoke about wanting attention from their parents and going elsewhere for that attention if they were not getting it, or just rebelling. For example:

Male: If your parents are like -- they're just really wanting you to get good grades so it's like, you don't want to do it so you're going to go out to other places and maybe get into stuff that you shouldn't be into.

Male: I think if you're not getting like enough attention at home or some -- you'll go somewhere else for it and if the drug dealers and the cigarette people or the smokers are going to give you that attention, well that's what they're going to go do 'cause they don't feel accepted which makes them not feel cool.

These last few statements show how adolescents struggle with the cognitive and psychosocial development that they are going through. Wanting to be noticed, while at the same time wanting to be left alone to make up their own minds causes them stress. It is usually parents who help young adolescents define their identities, but as adolescents change so does their reliance on parents. As adolescents seek emotional autonomy from parents, the reliance on the peer group becomes more important and parents are seen

as placing obstacles that are often contradictory in nature which causes a lot of stress/anxiety (e.g., adolescents are encouraged to be more independent and yet curfews are set)(Curtis, 1992). Curtis (1992) hypothesizes that teens engage in risk-taking in an attempt to establish their own independence but in fact they lack life experience and do not often understand the consequences of their activities.

At the beginning of the first focus group the adolescents were asked how they wanted to be described. The response was in some ways comical, but when serious consideration is given to what they said it epitomises the transition that adolescents go through. They requested that they be referred to as "Young adults with no experience".

Family members can be a cause of stress on the adolescents and this area is related to other themes that have been discussed. For instance, family members can pressure adolescents to do well in school and in physical activity, which increases stress. There was clearly a conflict in relation to what the adolescents perceived their parents wanted them to do and what they perceived they could actually do. It would have been interesting to know how parents would respond to these findings. Are parents expecting too much and being unrealistic? What role does the health care provider have in helping adolescents work through stress? How can the cycle change so as not to increase harmful high-risk behaviors?

A number of adolescents talked about facing physical violence in the family and how stressful that was for them. An example is:

Male: My family, my brother and my dad used to fight a lot 'cause my brother use -- my brother like he collects a lot of things then he puts them up on the basement walls. My dad used to get mad. And he smokes and everything and he like, I don't know, he's just a bad kid. And my dad, he used to like fight. Like they used to start yelling and punching each other and everything. And it was really bad. Like me and

my mom used to get like so scared and everything, so he used to cause a lot of anxiety in the house because they used to fight and break things.

Violence and illegal activities of any type need to be considered with respect to understanding the stress/anxiety that adolescents face. There were undertones of violence, being in trouble with the law, verbal abuse, and drug abuse in the focus group sessions. These factors can affect risk behaviors such as smoking and physical inactivity, and are also associated with increased stress/anxiety levels and drug abuse. Investigation into the incidence of violence and other illegal activities, and influence on the adolescent in relation to risk-taking behaviors would be important to study in the future.

Intimate Relationships - Peers

Sexual maturation in adolescence leads to an increased sexual awareness and experimentation. Sexual activity in adolescents has dramatically increased from the 1970s. In 1988 by the age of 15, 26% of Caucasian females and males have experienced sexual intercourse (Center for Disease Control, 1991). A greater proportion of adolescents are sexually active with each successive year of age. By the age of 17 approximately 50% of adolescents have engaged in sexual intercourse, with 10 - 20% of males, and 5 - 10% of females having had intercourse by age 14 (American Academy of Pediatrics, Committee on Adolescence, 1990; Burke, 1987).

Adolescents in the focus group sessions spoke about the importance of looking "good" for the opposite gender. Surprisingly there was a distinct lack of discussion regarding sexuality in all of the focus group sessions. One might speculate that this was because the focus of the discussion was not directly related to sexual relationships, or that the mixed groups did not foster an

openness to discuss this issue. None of the groups spoke of sexual relationships with peers, but the conversations were generally related to friendships. A possible reason for the lack of discussion may be that the adolescents were only at the beginning stages of sexual maturation. There is reported to be a clear relationship in the literature between risk-taking behaviors (e.g., smoking, alcohol, street drug) and earlier sexual relationships and other high-risk behaviors (Health and Welfare Canada, 1992; Kaplan, 1986; Rice, 1984), but the lack of data in this study prevented verification of that finding. It would be interesting to do further research looking at correlations between a variety of high-risk behaviors and age.

Peers

Adolescents are influenced by values from their parents. They are also influenced simultaneously by their peers. Peers play an ever increasing role in the social development of adolescents as they mature (Gander & Gardiner, 1981). The peer group can serve a variety of functions. It provides opportunities for adolescents to interact with others who are going through similar unfamiliar experiences and developing physically, mentally and socially. It also provides an opportunity for individuals to develop their own values and attitudes. Peer groups can and often do function in positive ways, but if individuals get involved in groups that are violent or if adolescents are not part of a particular group, they may find that they are made fun of, or are ridiculed (Gander & Gardiner, 1981; Hansell & Mechanic, 1990).

Peers: General Information & Control Issues

In general, the adolescents in the focus group sessions were very respectful to and supportive of one another. Although there were differences

of opinion, most students listened to what others had to say and then agreed or disagreed. On two occasions students actually put their hand(s) on the other when he or she was talking about something serious and told the other "it was OK". Teachers and parents often report that adolescence is a time of behavior changes and problems where adolescents do not respect and listen to what is being said (Personal communication, Grade 9 Teacher and Grade 9 Parent), but this was not completely supported in the present study. In this study no difference was noted between males and females in relation to listening. Both all-male and all-female groups expressed the importance of respect and listening to each other, but in the mixed focus groups there seemed to be a difference in how the boys and girls operationalized these concepts. The boys tended to try to control the conversation and although they seemed to listen when the girls spoke, the investigator did not always sense that they heard what was being said. In the process of developing identities it is important that adolescents feel that their peers listen and understand them. Part of adolescence involves the development of not only individual identities but also a group identity (Gander & Gardiner, 1981; Haviland & Scarborough, 1981; Rice, 1984). Developing identities for both individuals and for groups was clearly evident in this study and supported previous work in this area.

One aspect identified in relation to the influence of peers was control. Participation differed across groups. In the mixed group, males dominated the conversation and often spoke for the females, obviously trying to control the group and the conversation. Females in the mixed group often gave non-verbal indication of discomfort when certain issues were discussed. For instance, when the males were discussing the need for females to "look good" and how they often teased females who were "fat", the majority of females had their

arms crossed, were looking down at the table and appeared quite tense. When the facilitator asked them whether or not they wanted to add anything, or if they agreed with what the males stated, only one female would voice her opinion; the rest remained quiet and distant from the group.

As mentioned previously, at the beginning of the focus group it was interesting to note how the adolescents situated themselves in the room. They moved chairs/desks so that they could sit beside certain individuals. During the session it became clear that particular individuals were the leaders and others should only speak when given permission. In the males only focus group specific members would state to others that it was OK to speak, or they would nod their head at them. At other times the "quiet" males would look up and across the table to the dominating males to gain permission to speak.

In the first all-female focus groups the issue of control was not apparent. All of the females spoke and there was a clear respect for others in the group. They were courteous and openly apologetic when they interrupted someone else. In the second all-female focus group two individuals dominated the group, were openly sarcastic, and often made it quite difficult for others to participate. One participant was assertive to the point of being aggressive. Her manner which often appeared to "shut down" discussion in the rest of the group. Her voice was often raised, her tone abrasive, and she seemed to need to control the group. She openly admitted that she smoked and had every intention of continuing to do so. The investigator was left wondering about why her manner was so forceful. This outspoken girl and a friend appeared to intimidate others in the group, whose non verbal behavior (e.g., body language, arms folded, eyes looking down) spoke volumes in relation to their feelings of insecurity and unease in the group. There was a clear ability of some adolescents to put pressure on others not to participate. In fact, when others

wanted to speak they often looked toward these two as though asking permission. Whether or not this was because they respected or looked up to the dominating two females, or whether it was related to insecurity and intimidation was not clear. Another possibility may be that they were embarrassed by their peers' behavior.

Clayton (1991) reported in his study that girls who smoke were often more self-confident and rebellious and sexually experienced than their non-smoking peers. The investigator is not sure whether this young female should be classified as being self-confident, but clearly she was rebellious. Her manner and behavior could have been a facade to hide feelings of insecurity. Self-confidence and insecurity are areas that need further study in relation to risk-taking behaviors.

Overall, although the investigator had very little time with the participants, from the comments during the session, following the session, and what they wrote in the post focus group questions, the adolescents were clear that they wanted to be listened to, and to be allowed to express what they thought without threat of being "put down". The implication for health care professionals is that it is important to work more *with* adolescents to understand their perspective and have them work with each other with guidance (not control) from others. More investigation is needed into the area of regarding some of the control issues that arose in a couple of the groups is discussed later in this chapter.

Peer Pressure - Pressure to Conform to the Norm

Consistently, participants felt that pressure from friends and peers caused them to take part in risky behaviors. Adolescents described peer pressure as being associated with being, or doing something that is not

normally of their own choosing. As can be seen by the following quotes, there is pressure on adolescents to conform to the norm.

Female: Things like peer pressure, if like all of your friends are doing it, you gotta do it too.

Male: Well, I think it's just that, like if you don't want to do something, or you do it just because what your friends are doing, that's what I think peer pressure is.

Female: Well, because the people that I hang around with, most of us smoke. And it's just like peer pressure and like, if you start and you try it and you keep doing it, it's really hard to quit because of the people that we're hanging around with. It's like you all see them smoking and it makes your craving like hard to get over. Like, you'll want to smoke.

Female: Well, like our -- friends around us will, they'll sort of put you into a situation where it's like, if you don't smoke they'll like, -- they'll still accept you but you won't get as much respect if you did it, if you do smoke or whatever. They're sort of like peer pressuring you into smoking like, saying: Oh, yeah, it's cool, and everything like that.

Duryea (1991) differentiates peer pressure from peer persuasion. He conceptualizes peer pressure as nonverbal responses such as gaze, gestures, stance, and touch. Peer persuasion on the other hand refers to verbal responses such as name-calling, challenges, threats, dares, belittlements, and arguments. In this study both verbal and non-verbal responses were considered when trying to understand the effects of peers on behavior.

In the focus groups gaze and stance were two of the most frequent nonverbal responses noted. Verbal responses included some teasing and name-calling especially when the group was first starting, but this seemed to be done in fun and it did not appear to be taken in any other way by the recipients of the teasing. Initially it appeared that the group members were generally respectful of each other. On further reflection though, it appeared that even

though teasing might not have been done to be hurtful, the response to the teasing or name-calling was often one of withdrawal and unease.

Peer pressure was used by adolescents in a variety of ways both positively and negatively. Hover and Gaffney (1988) state that peer pressure is accepted as a significant factor in the initiation of smoking. Michell and Amos disagree and state that "very little is known about the nature of peer influence on smoking uptake" (1997, p. 1862). Some adolescents spoke about pressurizing people in a positive manner to change their habits such as not to smoke. One male stated: "...you can like not start smoking, not start drinking and do drugs and stuff, and like, don't give in to peer pressure. Like change your friends". Others see themselves being pressurized into changing and starting habits such as smoking. For instance one male stated:

It's all like people think like, if they don't -- like you go to a party or something and you see like, people doing pot or something....and then they like, ask another person to do it. If the person doesn't do it then they -- He has a whole reputation to think about 'cause they'll be like, considered a loser and stuff.

Participants in both of the all female focus groups spoke about the influence of their "male friends" on whether or not they participated in risky behaviors. One girl spoke about the "absolute necessity" of being with the "in group" and conforming to whatever was necessary. She told the group that she was having to consider quitting smoking or finding a new boyfriend because he did not smoke and he did not like the fact that when he kissed her she tasted like an ashtray. Throughout the session it was observed that she was very conscious about her appearance. She kept on looking in the mirror and played with her hair, and also was wearing "in style" clothes, make-up, and bright, exotic nail polish. Michell and Amos (1997) state that some adolescents view smoking as a positive behavior that will help them in their relationships. In

this instance pressure worked in the opposite direction: the girl's behavior (if she wanted to continue in their relationship) might have to change because of her boyfriend's pressure for her to stop smoking.

Other females in this same group denied ever feeling any peer pressure. They spoke about how important it was to look at the positive aspects of persons, and to accept them as they were. These girls ($n = 3$) appeared relaxed during the focus group, were wearing casual clothes, were clean, wore no make-up and only light nail-polish if any, and portrayed a positive self-image that was noted up by both the facilitator and observer. In particular, members of the group referred to one of these girls and commented on her positive attitude and approach to situations. Group members also commented on how when they felt down they would go and talk to her and she would always help them look at the situation in a different light. This psychological support by others can positively influence self-esteem (Gander & Gardiner, 1981).

Penny and Robinson (1987) in a study with 1225 adolescents found that there was a difference between smokers and non-smokers in relation to psychological resources. Smokers tended to have fewer psychological resources but higher levels of anxiety than did the non-smokers. One might speculate that adolescents with lower levels of psychological resources may have less motivation to care for themselves, may participate in less physical activities, and may have less ability to refrain from harmful activities (e.g., smoking, use of drugs).

An interesting issue that was discussed by a number of females was the need to be "someone else" when with particular friends in order to feel part of the group. Two girls in particular reported taking on completely different personas with different groups of friends. These different personalities were

difficult to sustain, as can be seen by the following example.

I used to have these friends -- well, I still do -- and I go hang out with them sometimes and they all -- and because I made a really big mistake the first time I ever met them and I started hanging around with them, I was like acting like a completely different person. I just wanted to see how people would treat me if I acted like that, and now every time I go see them they expect me to act like that and if I start acting like myself, they go like, what's your problem and stuff like that. They're like, what are you doing?

And I was like, oh I don't know. And then I gotta go back to being that -- like playing that part that you started off being a different character. And it's just -- it's really difficult to try to maintain an image with one group and different image with another and then other people will think other things of you.

And then if any of the groups clash and interact they all have all of these different opinions of you and if one group thinks that you're really smart and one group thinks you're a rebel, and this other group thinks that you're -- like you're you. And they always ask me, well, what -- she's not smart, like she's an idiot, no, she's not, she's like the most intelligent person that I've ever met. And then, oh, no, she's just weird. Like it's all different opinions of you.

Interestingly, although not all focus group members agreed that they felt peer pressure, they all recognized and spoke about the importance of being part of the group. One female stated: " ..oh shoot, I'm such a nerd if I didn't smoke". The adolescents agreed from all groups that their best friend(s) opinion meant the most to them. Hover and Gaffney (1988) conducted a study with 143 female high school students (Grades eight through ten) from two urban high schools in Australia. They found that many teenagers will initiate smoking because it gives them status and group acceptance, and that adolescents who had poor social skills often were unable to resist social pressures and peer pressure to smoke.

The adolescents in the present study also spoke about differences with

peer pressure depending on the size of the group. The larger the group the more pressure on the adolescent.

Female: "Cause you're -- when you're like getting into peer pressure, you're just doing what -- doing something for somebody else, not for yourself. And if -- and if it's a small enough group and if like -- if you're close, then, really, you don't have to do anything for them and they don't expect you to.

Adolescents were also asked where peer pressure occurred and how it affected them. In all focus groups both males and females talked about peer pressure occurring in all settings where adolescents were (e.g., school, after school, community, and social). There was a difference in the amount of pressure that adolescents felt in the different settings. Participants stated that peers exerted the most amount of peer pressure to participate in specific behaviors (such as smoking, alcohol, and drug use) at school, after school and in social settings. Three of the four focus group participants spoke openly about drugs, seemed to be well aware of drugs that were available to them and the effects of drugs on their bodies. They talked about classmates selling drugs or cigarettes on school property or wherever adolescents "hang out". The adolescents spoke about the community as being much safer, and free from pressures. One male stated that if you are part of a team in the community or an organization you "are there to do something" and you have a purpose to be together. Adolescents who participate in sports teams or other activities are more often non-smokers and have a better self-image (Health Canada, 1996). In this study, males often reported being involved in team sports. The majority of these males were non-smokers. Fewer females in the focus groups reported being in team sports, but more talked about self-image. Although this researcher did not use tools to measure self-image and self-esteem, it was apparent they were areas of concern for females, as had been

previously discussed. Whereas males did not talk much about their own self-image or self-esteem, but they did talk about self-image as it applied to females.

Peer pressure to look a certain way was evident in the data from all of the focus group sessions. Peer pressure can have an effect on an individual's beliefs about one's self as well as on peer relationships (Gander & Gardiner, 1981; Rice, 1984). For example, as previously mentioned in the section related to body-image males spoke about how obsessed girls were with their bodies. Ironically, males then talked about how individuals were teased and ostracized if they were at all overweight. On one hand the boys think that females are overly conscious about their bodies, but on the other hand, the boys are reinforcing the importance of appearance by teasing and being mean to the females if they are overweight. The males in all of the groups appeared to be very judgemental. Girls were also judgemental, not of the boys, but of other females or themselves. Although the comments made by both the males and females have been discussed, what is important to note is the intensity of those comments during the focus groups. It was clear to the facilitator and the observer that body image and diet were extremely important areas to the adolescents. Their tones were intense, and their expressions spoke volumes. It was noted, especially with the females the vulnerability they felt regarding what others said to them or about them. On more than one occasion females would look down or would "fidget" when boys or other girls were talking about them.

Peer influence regarding nutrition and more specifically eating habits was evident in all of the focus groups, but generally was associated with females. Wertheim et al. (1997) also found that peer influences were a strong influence on female adolescents' choices about healthy eating and attitudes about body appearance. It is important to note that peer pressure also affects boys,

with emphasis placed on athletic abilities and personality (Rice, 1984). This emphasis on athletic abilities was validated by the males in the focus groups. Males spoke about the importance of being on sports teams and keeping physically active, and how they were ostracised if they did not participate.

The role of specific high risk behaviors (e.g., smoking, physical inactivity) in the adolescent's life are important and must be considered when trying to understand these behaviors. For example, if smoking is viewed as a positive behavior then the approach to cessation might be quite different than if smoking is occurring because of stressors. More research is needed into identifying and describing the role that behaviors play from the adolescent perspective.

Need for Acceptance & "Being Cool"

"Being cool" was a theme that was mentioned repeatedly in the focus groups. It was brought out by both males and females, and was often related to peer pressure. There seemed to be no one definition of being cool but it included being unique, popular, part of the group, having friends, and ultimately being accepted. One female stated: "Cool means you're in, man... Like you're in with like, the crowd that like, knows everybody." Males in two of the focus groups spoke about how being athletic was part of "being cool". One male in particular described "being cool" as:

Not as much being popular. More as being accepted. Doing things that other people do. I'm not talking like drugs and stuff like, but-- sports, sports, like going out places, going to movies, parties and stuff.

One female spoke about how she needed to stay calm and "fit in" when she was around the "in" group. Feelings of inadequacy often led her to use smoking as a way to access the group she wanted to be part of. Being accepted was outlined by many males and females as being the ultimate

“success”.

Acceptance was as one female stated:

..fitting in. Once -- like, if you're accepted by them, it's not as bad because you're in there with them, you can be whoever you want to. But when you're on the outside looking in and you want to be there, you will do whatever it takes, depending on how bad you want to be accepted and part of the group.

Newman (1984) and Hover and Gaffney (1988) suggest that acceptance is a very important part of adolescence. Smoking initiation is often perceived as providing status and group acceptance for the adolescent. The need to be accepted was an issue that was an essential part of the group dynamic among adolescents and was strongly emphasized within each of the focus groups. Acceptance was reported by participants as being directly related to anxiety/stress. Both males and females spoke about the need to be accepted and be part of “the group” as a major stressor. Adolescents spoke about participating in risky behaviors such as smoking to help with being accepted, but also to help them stay calm. One example of needing to be accepted came from a female who said:

I think smoking is almost like a mental relief when you're stressed or when you are -- feel like being yourself, just won't -- you won't fit in; smoking is like something else -- something that will relieve you of the stress or that will make you look different, maybe someone that you're not, just fit in.

Just as smoking behaviors were often influenced by different types of peer pressure so was physical activity and inactivity. Adolescents in the focus groups spoke about being involved and very active in a variety of sports. Influences in relation to physical activity/inactivity centred around pressure from friends/peers and adults (teachers, coaches, parents). The pressure from adults will be discussed under the authority section.

In general the adolescents did not feel that there was a lot of pressure or influence on them regarding physical activity participation. They did what they could, to be part of the group. If the group they spent time with engaged in a lot of sports then they tended to do so as well. With regard to the pressure exerted on the adolescents in relation to participating in risk-taking behaviors or healthy behaviors one male student commented:

I think it's kind of like I think we all have like role models,-- kind of thing that can affect you. Like in a group there's kind of a leader and that leader you look up to and you can be led to do bad things; do drugs and if you do drugs or if you do like sports and he's a great athlete and he's a great guy and stuff like that, then you follow him and sometimes you can be the leader and you have to set the example.

Males in the groups spoke about being pressured to be involved in sports. Females also stated that they were involved in some sports but seemed less likely to be involved in organized teams. Females in this study did not seem to have the same pressures in relation to physical activity as did the males. In the Health of Canada's Youth, females were also less involved with organized team sports. Pate et al. (1995) also reported that males are more likely to engage in more vigorous, regular activity, exercise, and sports. The females in this study stated that it depended on the group they were in whether or not they were pressured to be involved in sports and to what degree they were involved. One female stated"

In my group, if it's kind of --it's pretty important because we all do sports together....We do it because it's fun and it is important. We can get together and do it on weekends and stuff and that way we get to socialize. And it's not necessarily the biggest, like it's not what bring us together. I'm just -- like, with us we just -- whatever we have in common is just another excuse to hang out and have fun.

From the above statement one can see that the pressure was not on having to participate but participation was linked to being "part of the group".

In summary, the literature in relation to the influence of peer pressure to participate or not participate in specific risk-taking behaviors in the adolescent population suggests that “susceptibility to peer pressure” is correlated with risk-taking behaviors, substance abuse and misuse (Dielman, Campanelli, Shope, & Butchart, 1987). The phenomenon of peer pressure in relation to identifying self-esteem, self-confidence, rebelliousness, and other risk-taking behaviors in adolescents warrants further investigation. Research is also needed to better understand the dynamics that occur between adolescents in relation to risk-taking behavior.

Physical Pressure

Physical pressure refers to any physical action exerted on adolescents by other adolescents or by individuals in authority, or any that adolescents applied to others. Although physical pressure was not brought out in all of the focus groups it is an important area to discuss. Some participants described events where there was both psychological and physical pressure to subscribe to a group’s ideas. One female described being detained with another friend for 3 hours by sports team members while the team members yelled, made her sit on the floor for an extended time period, and forced them to smoke (the group wanted her to conform to the norm, which was to smoke) . She stated: “They were scary. They were like bigger than me and they just scared me”. The female’s voice was shaking at the time she spoke of this incident and she looked around the room before she spoke. It appeared that she wanted to make sure who was present, or maybe who was not present.

The only other type of physical pressure that was mentioned was by males who described being so anti-smoking that they would physically go and take friends’ or other adolescents’ cigarettes and break them into pieces.

They stated that at no time did they physically touch or hurt any of the adolescents. This was their way of telling other adolescents that they did not like them smoking and were trying to help them with their "habit".

There is a lack of literature that addresses the issue of physical pressure in relation to risk-taking behaviors. The literature generally refers to peer pressure and social pressures associated with increased risk-taking behaviors, but both of these pressures are considered to be non-physical and have been discussed earlier in this chapter.

In conclusion, pressure from peers can be exerted in a variety of ways, all of which can influence behavior. Subtle pressure or teasing, which is meant only in fun, may be interpreted as negative and detrimental by the adolescent. This negative influence was evident to some extent in all of the focus groups, but was particularly apparent in the female groups.

Authority

Adolescents in a search to develop their personal identity face many challenges and stresses. Some of the major developmental tasks include achieving emotional independence from parents and other adults; preparing for a career; desiring and achieving socially responsible behavior and preparing for adulthood (Gander & Gardiner, 1981; Shantz & Hartup, 1992). Many individuals with authority interact with adolescents on a daily basis, and a number of specific individuals including coaches and teachers were mentioned in the focus group sessions. This interaction can take on many forms depending on the context and the individuals involved. Many adults view adolescents as rebellious, unappreciative, immoral, ill-mannered, irresponsible children who are only looking to have a good time (Gander & Gardiner, 1981; Rice, 1984). This stereotype of adolescents can negatively influence their beliefs regarding their

own ability and behavior (Gander & Gardiner, 1981; Rice, 1984). A more positive stereotype of adolescents shows that the majority are not problem individuals but individuals who are trying to develop a sense of “self” (Curtis, 1991; Gander & Gardiner, 1981; Rice, 1984). The focus group data included issues regarding: pressure to perform, consequences of pressure and stresses and vulnerability.

Pressure to Perform

It is important to discuss authority figures whom adolescents perceive to influence their behaviors. In this study adolescents indicated that coaches, teachers and parents had both positive and negative influence and pressure, in relation to smoking and physical activity/inactivity behaviors. Parental pressure was already mentioned under the “intimate other section”. Adolescents talked about mothers yelling and talking to them in attempts to change their behavior, while fathers remained more in the background. Teachers and coaches were mentioned by some adolescents in relation to the image or role model they portrayed. One male spoke about the contradictory messages that teachers gave. He stated that on one hand they teach them that smoking is “bad” and then they smoke.

Male: ...Your teachers -- it's the same thing 'cause those are teachers,-- 'cause when you were walking home he'd be driving his van, smoking. And like, you look at him and he would see you smoking and he'd like, put the cigarette down so you like wouldn't see him, even though we knew he was smoking.

Adolescents spoke about the influences coaches had on physical activities. Teachers were also seen as being role models who had influence on adolescents regarding physical activity levels. The teachers mentioned most often with respect to physical activity were, as expected, physical education

teachers.

Adolescents who felt pressure from authority figures were generally involved in some sort of organized team sports. Pressure from coaches seemed to be related to performance. Not only did this influence the adolescents' physical activity but it also was a stressor as can be seen by the following:

Female: Well, for me maybe just coaches because not at school, but like out of school. Just some coaches have to win. They are just -- so stuck on winning that they push you until you just can't take it anymore and then you just give up. Like you give up on yourself and then with your self-image, it starts kind of to go down. And that can cause stress also because you just don't do anything anymore, you're just, well, I can't anymore. I've pushed as hard as I can and that's all I've got and you can't!! (As this student was speaking she clearly was upset. She appeared frustrated. She had a tense posture and her voice was trembling. She appeared to be close to tears when she spoke of her coach).

There was discussion around whether or not males and females experienced different pressures related to physical activity. As can be seen by the following quotes some adolescents stated that there was clearly no difference between expectations and pressure on males or females:

Male: My sister's in college basketball and she practises every day after school, like four hours, and it's hard. She has games every day and weekends and stuff so there's lots of pressure on both -- for both genders.

Male: My sister's in dance and I don't think -- she's only at the house for like two days a week when she doesn't have dance, all the other days she's dancing like two or three hours.

In contrast some adolescents believed there was a distinct difference between how females and males were treated in relation to physical activities.

For example:

Male: But there is like more like, harsher like rules and stuff for boys to do because that's just the way it is.

Male: You're like expected to do -- be able to do like good right away, like it's better than like-- the girls can do.

Overall, pressure to perform was evident from the data and consequences of pressure included both stressors and vulnerability.

Consequences of Pressure - Stressors & Vulnerability

Adolescents in all focus groups spoke about the stress/anxiety caused by assignments, presentations, homework and exams. One adolescent spoke about the stress caused by teachers who have had a bad day: "If they had a bad day with another class, they expect you to be even better behaved than usual". All focus groups dealt with the stress of doing homework, but the majority of the comments were related to the unrealistic expectations that others (especially parents) had regarding their work. Some examples include:

Male: In my house, I have an 83 average now, but my parents are -- keep on pushing me to get my average up higher so I -- for sure so that I can make like university and all these good schools...

Male: Yeah . They want me to take everything.....That's their job. They want me to succeed in life and they want to make sure that I'll be okay. But sometimes it gets like -- to much!

It must be noted that although students talked about the stress of exams and homework, the stress was not on having to do it, but on how parents perceived the adolescent's performance. It would be easy to say that homework and exams are a major stressor when in fact the focus group data

suggests that the stress related to these areas is in the need to succeed and be successful according to their parents' criteria.

A sense of adolescent vulnerability or susceptibility in relation to authority control and possible interference was an issue that arose prior to, during and following all of the focus group sessions. Confidentiality of information shared was of utmost importance to the adolescents. The issue of confidentiality and vulnerability has been discussed at the beginning of this chapter.

In summary, authority issues and relationships were clearly identified in the focus groups. Those authority individuals who had close interactions with the adolescents could exert either positive and negative influence and pressure. The area of adult authority, vulnerability and adolescent development is very complex and more research looking at what constitutes a positive or negative influence is needed.

Society/Culture

Many societal and cultural issues and beliefs can affect adolescents' choice in relation to peer relationships, intimate relationships and participation. Some of these issues include parents, schools, media (television, magazines, movies), and societal beliefs (Gander & Gardiner, 1981; Health Canada, 1996; Rice, 1984). Intimate relationships and authority figures have been discussed under other sections. This section will highlight the area of media as it relates to behaviors and social learning.

Media Influence

The media can be a powerful source of inducement and attraction for all ages (Schramm, 1980, Winkelstein, 1992), but it is especially influential in

relation to adolescents. Because of the tremendous cognitive, physical and psychosocial changes adolescents face they are particularly susceptible to advertising. Magazines, models, movies, and music were media influences identified by focus group participants. The primary media influence was music. A number of adolescents mentioned the influence that Marilyn Manson had on them. Marilyn Manson was described as having: "his own style", being influential, and being unique. One female stated:

Well, I find that I always try to imitate like, what my favourite stars or whatever are doing, like my favourite band. And I always try to do like the band, so if they're doing something bad, so will I.

Many adolescents spoke about music and that they listened to it for the lyrics and the style. The type of music that was accepted differed from group to group. One female stated that they (adolescents) knew "which ones are acceptable to kind of share with your friends".

Females in the all-female focus group talked more about the influence of models and magazines on their behaviors.

...Magazines that are from the U.S., there's a lot of smoking and alcohol advertising and stuff like that, so it says that smoking is good sometimes.

Males spoke about how and where they learned about smoking and other risky behaviors. One male stated:

Television...Like you can see like what happens. That's the only way you can know, like, what really happens in life. And they have pictures of people that are all smiling and happy and like men and women together and stuff, and they're like, this is what you'll be like if you start smoking.

The influence of media cannot be underestimated. Although the participants often did not see the extent to which they were affected by the

media, it was clear in their conversations that part of being accepted and fitting in was also potentiated by the media. Girls talked about looking “a certain way”, while males talked about how “girls should look”. The impact of media seemed to affect the females in the study more than the males. The media affected the males mostly in shaping their views of how females should look and behave.

The media, often mentioned in the literature as encouraging adolescent smoking behaviors (Winkelstein, 1992), can be a powerful source of subliminal messages and social learning, and can be very persuasive (Schramm, 1980). Despite the millions of dollars spent by tobacco companies on advertising, the effect of media on smoking is not well documented in the research literature. Kushnir (1986) analyzed 250 episodes from books of fiction and found that smoking and drinking most often occurred during, or following social situations involving intense negative emotions, and that smoking or drinking led to more positive responses to the situation. Kushnir (1986) suggested that smoking in the episodes analyzed was portrayed as serving two main functions: it facilitated skill performance (cognitive, social, or technical), and it facilitated coping with stressful situations. Therefore, the media’s portrayal of the effects of smoking as a stress/anxiety reducer may be misleading. More research is needed in this area to determine the effect that the media has on shaping behavior.

Another factor that is important is the awareness of individuals regarding events and activities that have been sponsored or promoted by tobacco corporations (Health Canada, 1996). In Health Canada’s 1994 Youth Smoking Survey (1996) 49% of individuals aged 10-14 and 51% of those aged 15-19 report seeing advertisements for events that have been sponsored by different tobacco corporations. A higher percentage of adolescents who

smoked in comparison to those who did not smoke reported seeing more advertisements. In the Health Canada survey they also found that more males than females reporting seeing advertisements for tobacco-company sponsored events (1996). Whether advertisements encourage individuals to begin smoking or whether they encourage individuals to continue to smoke has not been well investigated.

Overall, the adolescents indicated that they did not believe that the media had any great impact on decisions they made. However, the investigator picked up numerous references to people, movies, music and other media influences that might have an impact on behavior. Media messages are often subliminal and therefore adolescents and others may not be conscious of the effects on behavior.

Influencing Factors: Stress/Anxiety

Although the concepts of stress/anxiety have been discussed and incorporated throughout this chapter they bear separate mention because of their importance. Stress/anxiety are reported in relation to overall risk-taking behaviors and stress/anxiety relievers.

Stress/Anxiety & Risk-Taking Behaviors

Stress/anxiety and risk-taking behaviors were closely related to the theme of acceptance previously discussed. Adolescents spoke about stress leading to risky behaviors and also how risky behaviors could lead to stress. Regardless of the risk-taking behavior it was often associated with the need to be accepted as described in the previous section. A number of adolescents spoke about the importance of considering the consequences of specific behaviors before doing something.

Male: If you're -- if you're like, doing drugs or drinking whatever, usually you don't even have to -- want to be caught by your parents, especially at our age or by anybody, like an authoritative figure, so right away that causes a lot of stress on you if you want to do that.

If you're gonna be like smoking-up all of the time, you got to make sure you don't get caught and that causes a lot of stress, because, you know, you gotta be careful where you do it and when you do it and that nobody's around. And it's -- like it's sort of is a waste of time because it's sort of stupid.

Female: well, sometimes, like it could be a good thing if you want to do something good you should do it, but if you're anxious to try something bad, then you should like think of the consequences.

The reverse is also true in that stress can lead to other risky behaviors. Adolescents spoke about stress leading to decreased socialization, an increase in sedentary lifestyles and the use of cigarettes and other drugs:

Female: Yeah, 'cause if you -- some people when they're stressed or depressed or whatever, like, some people will smoke and some people will drink and some people will do drugs or whatever and some people will sit there and eat. And then so if you're depressed you sit down and eat and then watch T.V. And then you just keep getting stressed and stressed so you just sit down and eat. You don't work anything off and you don't like say -- like you know, like, to talk to somebody or anything about your problem. So it builds up.

Female: Also if you're too stressed...then you'll just want to stay home and try and avoid it but then you're not as active and then you don't meet as many people.

Adolescents spoke about how risky behaviors helped them feel normal and fit in (need to be accepted). One male stated that risky kinds of behaviors was "just a way out...(pause)...for a while". Another male stated "It is just sort of an escape from like life, and everything was just like normal, and that way he wouldn't have to be himself and he thought that he didn't have to deal

with his problems". Another female talked about how anxiety led to looking at risky behaviors:

Female: I think that with anxiety and wanting to fit in you turn around and you look at behaviors that are accepted by those people. Like most of the people that a lot of teenagers are facing are trying to fit in with the so-called cool group and you look at what you do in your day and look at what they do and you kind of modify what you do to fit the mould of what they do so that you can be accepted by them. And that can bring about bad habits.

A number of adolescents spoke about how they could not be, or did not want to be what their parents wanted them to be, so they did what their friends wanted them to do. For example:

Female: I think, well, maybe not necessarily for me, but for peers, because like we go home and our parents, we think our parents want us to be perfect and want us to be goody-goodies, and maybe we don't want to do that. And we see our friends doing other things and we think, well, it's -- I can't be what my parents want me to be, maybe I can be what my friends want me to be. So then they'll try and act like their friends. So I think peers have a lot to do with our decisions.

Females also spoke about the anxiety caused by trying to be someone that you were not, or by being judged. This anxiety led to smoking behaviors just so that they could fit in and not look different:

Female: well, I'm pretty easy-going so, you know, I kind of go with whatever happens, happens. And I can accept that, but there's people that I kind of feel intimidated by so if I have to do something in front of them or if I have to go near them, I'm afraid that they're going to, you know, judge you and say, oh, well, she's not good enough...I feel like I want to be accepted. So it's -- I guess that's the only way that I would feel anxiety or stress is when that I go near them and I just don't like being judged or want to be judged. I want to be liked by everyone and accepted by everyone.

Female: I guess it must come back to sometimes being somebody else. When you get anxious or whatever and you have to smoke and she said

somebody who really doesn't care for you, and you don't understand why. You just want to be accepted. You sometimes try to be somebody else so that maybe they'll look at you differently. And they won't say anything, they'll just leave you alone.

It is interesting to note that the majority of comments regarding anxiety and specific stressors came from females and not males. The males spoke about some of the pressures placed on them by parents and about how important it was to be accepted by peers. However, the females spoke about frequent and sometimes daily stresses related to image, parental pressures, and acceptance. Not only were the comments different between the males and the females but so was the intensity in which the comments were made. The females' emotional intensity was poignant. The difference may be that because more all-female focus groups were conducted than all-male focus groups, the male data are incomplete. One also needs to consider that males and females have been taught by teachers, parents, and others how they are to respond to stress/anxiety. It might be suggested by some that females are more emotional and therefore one would expect "more passion" and emotion in their comments, while males are to be "more controlled". However, it appeared to the investigator that females spoke about more stresses than did their male peers, and their comments and statements appeared to be passionate, open and honest. This is an important area in which more research is needed.

Participation varied in relation to discussing stress/anxiety, particularly in the mixed groups. In that group, it appeared initially, that stress/anxiety were not important, but further observation changed that view. When the discussion turned to stress/anxiety all three girls and one male in particular became quiet and did not participate. Their body language changed: they leaned forward on the desks, crossed their arms, and looked down. Two of them (females) began doodling on papers in front of them. Interestingly, within a span of 10 minutes,

these same four individuals excused themselves to “go to the washroom”. On reflection it appeared that the discussion regarding stress/anxiety made some of the adolescents uncomfortable and one way in which they could control the situation was to leave the session and “regroup”.

It would have been interesting to see whether or not the discussion regarding stress/anxiety was different if those students were in separate focus groups sessions, as the all-female or all-male focus groups appeared to be more willing to discuss stress/anxiety than did the adolescents in the mixed group. On reflection this may have been due to the fact that adolescents are struggling with new roles and responsibilities in relation to identity and feel more comfortable with members of their own gender (Rice, 1981).

Adolescence is filled with challenges and growth physically, psychologically and socially. One phenomenon of interest that really struck a chord with the investigator was the belief that many adolescents shared in the focus groups about needing to “pretend” to be someone else. This “someone else” would be the person who would be accepted. The sense of inadequacy about who they were and whether or not some of them were accepted was overwhelmingly felt by some of the adolescents.

Adolescents spoke about their beliefs that they should be better people and because of their insecurities they could not be themselves. Mitchell and Amos (1997) found that girls who smoked were often described as being “good-looking”, “loud”, “cool”, and “dead popular”. These findings are also supported by Clayton (1991) who found that girls who smoke may be more self-confident, rebellious, and sexually experienced than non-smokers. Males who smoked on the other hand, smoked as a way to cope or deal with social inadequacies (Clayton, 1991). Clearly more research is needed in this area to look at specific differences between males and females and risk-taking

behaviors.

The investigator is not convinced that the findings for the adolescents who smoked in this study were similar to the findings by Clayton. In fact, many of the adolescents who spoke about “feeling good about themselves”, and being positive, openly stated they did not smoke. The individuals who identified themselves as the smokers in this study often did appear loud and, from comments and observations made in the group also appeared to be striving to be popular. One interpretation of their actions and verbal and nonverbal cues in the focus groups might be that these individuals were not self-confident but in fact were insecure. They might only feel confident in themselves when they are in control of the group. For example, two females were assertive and often aggressive and controlled one of the all-female groups and on the surface this may have the appearance of self-confidence. The investigator would argue that this portrayal of self-confidence was actually one of insecurity. When other members of the group spoke or attempted to disagree with them, these individuals would become even louder, and would make scathing remarks about others. If individuals were self-confident they would encourage views of others, but would be able to defend and justify their views. The role of developing one’s self is part of adolescence. It may be that adolescents in the early stages are still struggling with the roles and responsibilities and have not mastered the skills needed in relation to “achieving identity”.

The investigator also observed that although there was an apparent need to be accepted by all adolescents, this was particularly stressed by those who identified themselves as participating in high-risk behaviors. The same individuals also spoke about needing to be “at the top” or in the “in” crowd. It would be interesting to do further study in this area to better understand the areas of self-esteem, self-confidence, security, and coping in relation to risk-

taking behaviors.

In summary, stress/anxiety was related to the beliefs and cognitive development, and roles and responsibilities in relation to self, intimate others, peers, authority and society/culture. Stress/anxiety can lead to participation in risk-taking behaviors, but risk-taking behaviors can also lead to increased stress/anxiety.

Stress/Anxiety Relievers

Adolescents in all of the focus groups talked about physical activity as something to do that can help decrease stress/anxiety levels. They also mentioned the difference in their ability to do things and be happy as a benefit of physical activity. A number of adolescents spoke about the importance of physical activity to help relieve stress and improve self-esteem.

Female: I think people like when they are physically fit, when they relieve stress, you know, they go for a walk or something and make themselves calm down, and feel better. They also need to at least to have a change and have a new lifestyle to remove stress.

Female: I know a lot of people that aren't physically fit, that would relate them to stress because like say they're like not that well-build and stuff and they're sort of on the chubby side or whatever, they'd probably like get stress from people at school saying, oh, yeah, you're fat, lose weight and everything, and then they'd want to be more physically fit. But it's hard to change yourself....

Female: I think like on the other end people who are more physically fit, I think, don't undergo as much stress because they have that as a reliever and if you're always working out then it increases your self-esteem and your perspective of yourself....see yourself in a positive way.

Other females spoke about the importance of socializing with people, eating right and exercising so that you feel happy:

Well, you kind of have to socialize with other people and interact, and

that way you feel better.

It makes you feel happy so that you want to do other stuff. And then that way if you're happy, then you will go and you will eat healthy and you will exercise and stuff. Yeah, 'cause then you feel more free to actually take care of yourself.

It has been well documented in the literature that physical activity can reduce stress/anxiety (Calfas & Taylor, 1994; Health and Welfare Canada, 1992; International Society of Sport Psychology, 1992; Pate, et al., 1995; Wankel, 1993). The investigator felt that adolescents, particularly females, were able to identify the psychological benefits of physical activity. Males tended to focus on the work-out for their body, not the benefit they might also get for their mind. Males also spoke about more vigorous and organized team sports activities than did females.

Focus Group Feedback Sheets

As described in the Chapter 3, adolescents at the end of each focus group were asked to complete a form describing from their perspective what was valuable about participating in this project; what they liked about themselves; and what they would like to change about themselves. See Appendix D for Post Focus Group Questions form. The rationale for including these questions was to identify what adolescents believed important regarding themselves and possible influences related to CVRF and anxiety, and to give the researcher some feedback regarding the focus group sessions. What was found was that the responses essentially validated the focus group data in a variety of ways.

A number of adolescents noted on the form and/or told the investigator personally the importance of doing this study, and how much they enjoyed

being part of it. They stated that it helped them understand things better and it gave them the opportunity to discuss their views. The adolescents stated that they were *really* listened to and that they felt that they needed to do more sessions like this. In reading the forms, the importance of listening and respecting adolescents' views was clearly evident. The project was designed so that the perceptions and views of the adolescent would be the essence of the research. Many of the adolescents identified that participating in this research allowed them to express their opinions, to hear others, and to think. A number of students noted that they were surprised at what their peers believed and that hearing what others had to say was very valuable. For example:

Mixed Group: What was most important for me was probably that we got the opportunity to discuss a lot of stuff that we usually don't talk about.

Female Group: I think this class was valuable because it taught me things I didn't know, and let me express my opinion and what I thought and felt.

Female Group: To me, the most valuable part was that you got to hear what others thought and got to make any comments you wanted. It really made you think.

Female Group: I think this project was valuable because I got a chance to think about the topic. Usually I don't because I'm really busy with other things. Today I actually sorted out what I think about health and fitness.

Male Group: From this project, I learned about some of the effects of smoking. We got to express our feelings about the subject and it helped me understand.

Some other reasons for participating in this research project included:
informing the adult population about what goes on in the adolescent life;

learning about health and the importance of keeping healthy; learning about the effects of smoking and inactivity; and learning about keeping one's heart healthy.

In relation to what adolescents liked about themselves, some commented on specific abilities they had (e.g., drawing capability) while others mentioned about being caring towards others. The information gathered from the written feedback regarding participation in and the importance of physical activity reinforced the findings from the focus group sessions. Many males and females mentioned that they liked being physically active, which was consistent with both the feedback forms and what was stated during the focus group sessions. Six out of seventeen females in the female only focus groups wrote about some physical characteristic that was the thing they liked about themselves (e.g., "my hair", "my eyes", "the way I look"). In one of the female only focus groups two of the females wrote about liking their attitude and their ability to help others. One female was quite negative in her overall comments and stated in relation to this question: "I like my smoking/drug/drinking habit. Although I was not the one who said I smoked out loud". These comments reinforce the importance of image overall and the misconception that "looking good" equates with being physically fit.

The adolescents in the males only focus group wrote about being active, having friends, being honest and staying out of situations that might be harmful to their health as things they really liked about themselves. This was consistent with the data from that specific focus group in that being active was important to these males. Furthermore comments regarding what they would like to change about themselves included: "not to discriminate", "to exercise just a little bit more", to "stop making fun of people because it may hurt them". These comments did surprise the researcher because up until that point it was

unclear whether or not the male participants realized the impact of their teasing. One possible reason for this difference may be that in a group setting the males felt it was important to maintain appearances, but inwardly they were aware of the effect that their comments had on others.

Two males also spoke about the influence of peers as a thing that they would like to change. They stated:

Try not to have not even a puff of a cigarette at parties. This session taught me how.

I would like to be able to have more influence on my friends and help them to make better decisions.

The girls in the females only groups wrote many comments about changing the way they looked, and about changing their mental health. Some examples include:

I want to get in better shape. My thighs and my tummy are kind of fat and I want to look pretty.

The way I look cause I'm ugly and fat.

I would like to change how I stress and worry about little things that aren't so important, because it really brings me down and others get annoyed with me.

I would like to change my mental health on the most part.

I would like to change my mental health and maybe not get so stressed. I would like to change the way I handle problems. I would like to talk about it instead of just keeping it inside.

If I could change something about myself, I would like to be taller. I also wish I had more self confidence because I don't talk a lot, and therefore people don't notice me that much.

Adolescents also found that they gleaned information regarding heart

health and also learned from their peers how they thought and how they could possibly change some of their habits. The intent of the focus groups was not to inform and it is interesting to see the comments from adolescents who wrote about how much they had learned. The learning occurred from talking with peers about heart health. Only when there were questions directly to the facilitator and observer regarding heart health would points be clarified. The comments made by the adolescents reinforce the belief of the investigator that it is important to involve the adolescents in learning about risk factors, behaviors, and influences, in order to develop programs that meet the needs of the adolescent.

Summary

In summary, the focus sessions provided a wealth information from the adolescent perspective. Themes were developed from the data in relation to influences on behavior and were further divided into two categories: beliefs and cognitive knowledge and developing roles and responsibilities (self, intimate others, peers, authority, and society/culture) as outlined on Table 60. Adolescents in general were able to identify the risk factors of cardiovascular disease but did not clearly understand how these risk factors affected their hearts. It appeared that they had a sense of invulnerability in that they know the risks but did not feel that they would be affected.

In relation to roles and responsibilities in the development of “self” body image was an important theme, and differences were observed between males and females. Both males and females spoke about the importance of females “looking good”, but it did not follow that it was important for males to “look good”. Although both males and females considered themselves to be active, neither group identified that they did so primarily to stay fit. They identified

being “part of the group” as the main motivating factor. Both males and females faced a variety of peer pressures which included: the pressure to conform to the norm; need to be accepted; control issues; and physical pressure. The need or desire for acceptance often led adolescents to change behaviors (e.g., smoke, participate or not participate in physical activities).

Peers were identified as being most influential in relation to smoking and physical activity. Adolescents also identified that they often did things “just because” they knew that their parents did not approve. Other influences on behavior included authority figures and social forces, such as the media.

Adolescents in the focus groups clearly indicated both verbally and in writing the importance of being able to discuss their beliefs and feelings regarding health issues. Many stressed how important it was to have group discussions on the factors that keep one’s heart healthy, and the influence of certain factors and pressures. Clearly more research is needed to further define and explain specific behaviors in relation to adolescent development.

CHAPTER 7

CONCLUSIONS, SUMMARY AND RECOMMENDATIONS

The focus of this chapter is to present and interpret the findings of the entire study. An integration and discussion of the questionnaire and focus group data with identification of similarities and differences is provided. Methodological issues, strengths and limitations of the study and directions for future research are then discussed. The major findings of the study are also highlighted.

Triangulation

According to Denzin (1989) triangulation refers to the use of multiple methods in a particular study to examine complex human phenomena. Types of triangulation may include: theoretical, method, data, investigator, or analytical triangulation. In this study method triangulation was used. Method triangulation is the most common and involves the use of more than one research method or procedure in a study, (Burns & Grove, 1993; Denzin, 1989; Mitchell, 1986) including different designs, instruments, or data collection procedures. Single approaches to describing a concept or area of study can be limiting and incomplete. By using triangulation the investigator can more fully examine complex concepts of interest to nursing.

The triangulation used in the present study included both quantitative and qualitative methods. The intent was to examine the CVRF of smoking and physical activity/inactivity from different perspectives. The purpose of the questionnaire was to obtain specific information regarding knowledge of CVRF, participation in risk factor behaviors, and to identify and describe the variables that adolescents believed were important for cardiovascular health. The focus

group method was used to gather more in-depth information regarding the beliefs, perceptions, and knowledge of the CVRF of smoking and physical activity/inactivity, and to explore how stress/anxiety might influence the CVRF identified.

Integration of Data: Questionnaire and Focus Group

The purpose of this descriptive study was to add to the existing knowledge base regarding the CVRF of smoking and physical inactivity in the adolescent population. The major research objectives of this study were to:

- assess adolescents' knowledge regarding the CVRF of smoking and physical inactivity
- identify the factors that adolescents think influence the CVRF in themselves and other adolescents
- explore what adolescents think about the effect of anxiety and the CVRF in themselves and other adolescents

Both the questionnaire and focus group sessions provided extensive amounts of data that were important to consider. The intent of this section is not to repeat the information contained in the previous chapters, but rather to identify, discuss and synthesize some of the key similarities and differences identified between the questionnaire and focus group results. The findings are discussed in relation to each of the research questions.

Research Question #1: What is the frequency of the CVRF of smoking, and physical inactivity?

Risk Factors

Risk factors were identified in both the questionnaire and the focus group sessions. In the questionnaire the risk factors of smoking and physical activity/inactivity were investigated. Although these same risk factors were identified by the focus group participants, it was apparent that these behaviors were often only examples of how specific developmental roles and responsibilities affected adolescents. For the purposes of this study the two risk factors that were specifically addressed were smoking and physical activity/inactivity.

In general, the adolescents in this study reported levels of moderate to high levels of physical activity. The levels of activity were consistently reported in both the questionnaire and the focus group data. The major difference between males and females was in the levels of participation and with whom they participated. Males in the focus groups were more involved with organized teams and were active in more of the vigorous activities (e.g., playing football) than the females. The males were most often involved in organized sports, which is consistent with national findings (Health and Welfare Canada, 1992; Health Canada, 1996).

It was also noted in the Health and Welfare Canada report (1992) that males played more computer games than females (15.4% of males played more than 7 hours of computer games per week, no females played more than 7 hours of computer games per week). Health and Welfare Canada (1992) also found that males spent more time watching TV and playing computer games than did females. However, it is difficult to compare these findings in a

meaningful way because different scales of measurement and questions were used between the studies.

It was not clear from the questionnaire analysis or from the focus group sessions what activities females are engaged with. Females in the focus group sessions did speak about watching TV but spoke about the role models on TV that they felt influenced them (e.g., "Friends"). Information regarding the influence television had on adolescents is addressed in the research question regarding the factors and influences that affect behavior. It would be interesting to know what females are spending time doing (e.g., talking on the phone, appearance, other activities) if they are not spending as much time on watching TV, or playing computer games??

Previous studies have indicated that non-smokers tend to be more active than smokers (Health and Welfare Canada, 1992). This was not the case in this study based on the data from the questionnaire or focus groups. The results indicated that both smokers and non-smokers were moderately active to active. In all of the focus group sessions a number of students openly admitted to smoking and stated that they had no difficulty in exercising and they continued to be very active. The difference between the findings in the present study and other studies may be related to the smaller sample size in the present study. The difference may also be related to the fact that the adolescents in the present study were younger than those in other national studies (Health and Welfare Canada, 1992; Health Canada, 1996). It is important to consider how representative the sample of 57 students in this study is in relation to the population of Grade 9 students. Other factors that need to be considered include socioeconomic status (SES), and the fact that the adolescents in the present study came from only one school system.

Another difference was that the females in the present study had higher

levels of activity than in the national studies. One concern with the national study is that the results are presented for Canada, and there is no breakdown of statistics province by province. Therefore, it makes it very difficult to interpret the results. It would be important to track activity levels over time within the province in order to make more meaningful comparisons.

There were no previous research studies that clearly categorized and compared the types of activities in which adolescents participated. From the analysis of the questionnaire data there was a statistical difference between males and females, with more males participating in golf, hockey and soccer. These sports are generally considered to be "male dominated" sports or team sports (hockey and soccer). Another important difference that was identified from the questionnaire data was that females and those adolescents who smoke (both males and females) walk more frequently than do males and those adolescents who do not smoke. No literature was available that specifically addressed the physical activity of walking. Data gathered in the focus group sessions was general in nature and overall both males and females reported being active physically. During the discussions, males talked more about team sports and activities than did females.

It was not possible for the researcher for ethical reasons to identify the number of smokers in each of the focus groups. Some of the adolescents identified themselves as smokers, but others did not. The intent of the focus group was not to gather statistics and therefore comparison of the focus group data to the questionnaire data can only be done superficially.

From the questionnaire data, it was found that, 65.4% of males and 41.9% of females had *never* tried smoking. Of those who did try smoking 33.3% of males and 50% of females continued to smoke. These figures are similar to the national data and more specifically the Alberta provincial data

(Statistics Canada, 1997). An important question of course is why certain individuals never smoked or tried but did not continue to smoke. Conversely it is also important to determine why the smokers continued to smoke. This is discussed under the section on influences.

It is worthy noting that twice the number of females as males had tried smoking. Although this difference was not statistically significant, the investigator believes it is *clinically* significant. The trend noted in this study was also identified in 1996 General Social Survey (Statistics Canada, 1997) which reported that an alarming 48% of females in Alberta between the ages of 15-24 were regular smokers. What is even more of a concern is that previously Health Canada (1994) reported that in Alberta 6% of 10-14 year olds smoked. In this study the rate of male and female 14 year olds who had tried and continued to smoke was 21% (males = 11.5%, females = 29%). If the sample statistic is representative of the population this means that there has been a rapid increase in the number of young adolescents beginning to smoke. This is of particular concern, especially since the earlier the age at which individuals begin to smoke the more likely it is that they will become addicted and continue to smoke.

In this study, girls who tried and continued to smoke, smoked on average, earlier than boys (girls who tried smoking and continued: average 11.2 years of age; boys who tried smoking and continued: average 13.3 years of age). The small numbers in each cell prohibited a statistical analysis to detect whether or not there was a statistically significant difference in age between male and female smokers.

The increase in young females smoking from an earlier age may also have an impact on the number of women who will develop respiratory and cardiovascular disease in the future (Heart & Stroke Foundation President: AB

& NWT, personal communication, September, 1998). The increase in smoking in youth has significant implications for health promotion policy *now* and cost implications for the health care system in years to come.

In summary, the smoking rates in this study are comparable to the national average of 15-19 years olds, but are alarmingly high in comparison to the National rate of 10-14 year olds reported in 1996. This study is consistent with the most recent General Social Survey (Statistics Canada, 1997) which shows an increasing number of young female smokers in Alberta.

In summary, in relation to physical activity, the students in this study were generally moderately active or active, which is comparable to the national average. Males in the sample had higher levels of activity than females, but females in this study had higher levels of activity than the national average (Health and Welfare Canada, 1992). Males were more active in some activities such as golf, soccer, hockey and watched more TV and played more video games, while females in general, and male and female smokers tended to walk more. In relation to smoking, more females have tried smoking than males, and more females continue to smoke. The female smokers (mean age 14) have been smoking for three years compared with less than one year for the males.

Research Question #2: What knowledge do adolescents have regarding the cardiovascular risk factors of smoking and physical inactivity?

Knowledge

In relation to the knowledge of heart disease and risk factors, both the questionnaire and focus group findings were similar. Based on the questionnaire data, adolescents were able to identify the major risks associated with heart disease. They were also able to identify some of the health risks associated with smoking and the health benefits in relation to physical activity. One of the differences that became apparent in the focus groups was that adolescents did not fully understand how some of the risk factors affected certain body systems and in particular their heart.

Adolescents believed that heart disease was a disease of “older people” (>34 years). The literature does support this belief that heart disease is generally a disease of older people (depending on one’s definition of “older”). However, adolescents were not able to identify that heart disease affects males and females at different ages. Heart disease is most commonly seen in the fifth decade in men and in the sixth decade for women but both, and in particular males can develop CVD earlier in life (Heart and Stroke Foundation of Canada, 1997).

Both males and females in the focus groups spoke about how their current behavior can have consequences for health in future. Although this was said a number of times in the focus groups there was a sense of invulnerability with respect to HD happening to them. This may be related to the fact that adolescents lack life experiences that help them understand the consequences of potentially harmful activities (Curtis, 1992). No questions were asked in the

survey that identified whether or not adolescents believed that what they did now would have an effect on them later in life and therefore the questionnaire and the focus group data cannot be compared.

In all of the focus groups the adolescents were able to identify and talk about the relationship of smoking and lung cancer. What they did not clearly understand was how smoking, physical inactivity or diet affected the heart. This was apparent in the focus groups and can be illustrated by the example of one female who stated that if individuals are not obese then they are fit and they should be healthy. The implication here is that not being obese is viewed as a necessary and sufficient factor for being fit and healthy. It would appear that adolescents have a misconception regarding the meaning of heart health (one is healthy and fit if they are not "fat") and the relationship to body weight, and physical activity/inactivity. The obsession with body weight and appearance was particularly evident in one of the all-female focus groups.

The non-smokers in the study were able to identify more often the benefits of physical activity and the health risks of smoking than their peers who smoked. This trend has also been reported by Health and Welfare Canada (1992). From the data in the present study it is not clear why this difference is present. It is speculated that it may be due to a lack of knowledge by adolescents related to the risks associated with smoking, and benefits associated with physical activity. It could also be related to denial by the adolescent who smokes to admit that smoking had an impact on health.

Smokers were less likely to be able to identify prevention of heart disease, improved breathing, and prevention of lung disease as benefits of physical activity than were non-smokers. The difference between smokers and non-smokers in identifying that physical activity could prevent heart disease approached statistical significance. The difference between smokers and non-

smokers in identifying prevention of lung disease as a benefit of not smoking was statistically significant, with non-smokers being more likely to identify that not smoking would help prevent lung disease. As well as the statistical significance, these issues (preventing heart disease and lung disease) have both clinical and practical significance. For example, Heart Health programs and health curricular development in the schools both need to address the risk-taking behaviors from the understanding and belief of the adolescent.

One area of concern was the inability of the adolescents to identify that physical activity could help prevent bone problems. Only 50% of non-smoking adolescents were able to identify that physical activity could help prevent bone problems, this number dropped to 25% in the smoking group.

It is important to consider why differences are present in smokers and non-smokers. It is unlikely that the difference is that smokers have not been given the information. It seems more likely that perhaps smokers do not believe the information or that they internalize the information differently. When comparing the smokers and non-smokers they did not seem to differ substantially from one another in terms of demographics. A simplistic view may be that the smokers are trying to rationalize their habit by saying that smoking is not linked to these disease problems, or if they do know there is a relationship between smoking and certain diseases, they believe that, when the time is right, they can do something about it.

The smokers in this study were on average 14 years of age, and probably did not have any major pulmonary effects (e.g., lung consolidation). The focus group data similarly revealed that adolescents could discuss risk factors for heart disease, and at face value at least, they appeared to understand that what they did now (e.g., smoke) might affect them later in life (cause CVD). On further reflection while the adolescents were able to talk

about how certain behaviors might affect them later in life, in further comments they could not internalize that what they do (e.g., smoke) or not do (e.g., are not physically active) will affect them later. A number of adolescents spoke about “knowing” the risks, but they did not see themselves continuing in the risk-taking behaviors long-term. They spoke about quitting whenever they wanted. They also spoke about HD as being something someone else developed. They could not fully comprehend how HD could affect them, even though they appeared to know the basic knowledge. The comments about adolescents “knowing” but yet not being able to internalize the risk-taking behavior is supported by the cognitive psychological theory in relation to adolescent development (Beck, Emery, & Greenberg, 1985). The adolescents simply do not “see” that behaviors now have consequences later. The intriguing thing is that *some* of them do! The challenge is to understand the ones that do see things differently.

Knowledge of factors that affect the cardiac system were also understood differently when family history of heart disease was taken into consideration. Individuals in the group who spoke about how smoking had affected someone close to them seemed to have a better understanding of the risks involved. This may be as a result of them being able to internalize the risk effects as opposed to only being able to intellectualize them. Whether or not this resulted in fewer risk-taking behaviors was not clearly identified. It would be interesting to do further research in this area to determine the impact that family history of disease has on risk-taking behaviors. The literature clearly shows that adolescents with other family members smoking in the home are more likely to smoke, and those who are physically inactive will also often have family members who are inactive (Health Canada, 1992). Other aspects that were identified in the focus groups and need to be considered in relation to

whether or not adolescents smoke or are active include the identification of level of parental support, and issues of self-esteem, self-confidence, and acceptance. These will be discussed in the following section.

In summary, the questionnaire and the focus group data in relation to identification of risk factors by adolescents on the surface was adequate. If one only looked at whether or not adolescents could identify the risk factors then it would appear that the information gathered from the questionnaire items would be more than adequate. The identification of basic knowledge does not by any stretch of the imagination reflect what the focus group data revealed. The focus group data clearly revealed that adolescents are able to cite the major risk factors and are able to understand them at a basic level. This does not mean that they necessarily have the ability to internalize these findings and are able to speculate regarding their personal future if they participate in certain behaviors. It is essential to keep in mind that adolescents are at the developmental stage of formal operations, but they might not be actually be able to fully function at this level. The formal operational stage includes: combinational logic, separating the real from the possible, using abstractions, hypothetical-deductive reasoning, and the ability to think about thinking (Haviland & Scarborough, 1981; Kaplan, 1986; Wong, 1993). It is key to remember that although adolescents might have knowledge re risk-taking behaviors, knowledge in and by itself will not necessarily change behavior.

Research Question #3: What individuals and factors do adolescents think influence the CVRF of smoking and physical inactivity in themselves and other adolescents?

Influences

A variety of influences were identified from the questionnaire and focus group data. Parental influence has clearly been associated with increased smoking rates (Hover & Gaffney, 1988; Michell & Amos, 1997; Nolte, Smith & O'Rourke, 1983; Pebler et al., 1987; Health Canada, 1994). In the current study parents were the most frequently identified family members who smoked in the household. In the Health Canada 1994 "Youth Smoking Survey" there was a strong association between daughters and mothers who smoked that was not present in this study. In the present study all of the girls who answered had fathers who smoked, and only three had mothers who smoked.

During the focus group sessions the adolescents also spoke about the role and influence that parents might have on smoking and physical activity. There were differing opinions by adolescent regarding what influence parents would have on behaviors. It became clear on reflection that just looking at whether or not parents smoked or encouraged adolescents to participate in physical activities was not adequate (i.e., if parents smoke, therefore the adolescent will smoke). The relationship between the parents and adolescents and the adolescent and their peers appears to be an important factor in understanding why an adolescent would participate in risk-taking behaviors.

For example, if a female adolescent did not get along with her parents, and they smoked, would she be more likely to smoke, or would it be more likely that she would not smoke? Previous research literature tends to suggest a linear relationship (e.g., if parent smokes, adolescent will most likely smoke) out

of something that is non-linear. What is missed is that a linear relationship does not address the interactional effect between relationships with parents and other role models. It makes sense that the developmental tasks the adolescent is trying to accomplish affects how they interpret the benefits or costs of certain behaviors. How they interpret the risk will help determine whether or not they participate in the risk-taking behavior.

Although the literature clearly addresses the importance of parental influence, another influence that is often cited as being even more powerful is peer influence (Health Canada, 1994; Health and Welfare Canada, 1992; Hover & Gaffney, 1988; Stacy et al., 1992; Winkelstein, 1992). The questionnaire results indicated that peers were important in initiation and continuation of smoking behaviors. In relation to physical activity, the question that addressed why adolescents would not participate in activities was poorly answered (many left the question blank) and as a result no meaningful interpretation could be made of the responses to the question.

In contrast the focus groups provided a wealth of information regarding the influence of peers on adolescent smokers and non-smokers. Peer influence was the most powerful influence cited by the adolescents in this study with respect to smoking and physical activity/inactivity behaviors. The perceived role and power that peers have was significant. Participants described peers as having the ability to accept or deny access into specific groups. It is important to note that peer pressure can be both positive and negative. Peer pressure was used by non-smokers in a positive manner. They encouraged others not to smoke and provided encouragement for friends to participate in healthy activities.

Despite the fact that adolescents had some understanding of risky behaviors, and the associated health risks they did not refrain from

participating in high-risk behaviors because of that knowledge. In fact, when considering the benefits and cost associated with specific behaviors (e.g., whether or not to smoke), the health risks did not have a great influence on the adolescents' decisions. During the focus group sessions it became apparent that regardless of health risk the decision to participate in a particular behavior was determined by the benefits that doing the activity would bring the adolescent. For instance, if the outcome of participating in a certain activity would be acceptance into a specific group, or an increase in prestige within the group, the adolescent would seriously consider taking the risk.

The questionnaire data provided information regarding the influences associated with the CVRF of smoking and physical activity/inactivity. Adolescent males identified that they were encouraged to participate in physical activities mostly by their best friends. This was not the same for females, and this difference was statistically significant. More males than females also identified that their "best" friends were also more likely to work out at least every week. The role of "best" friends appeared to be somewhat different for males and females based on the questionnaire data, with males' "best" friend being more visible and involved than the females' "best" friend.

During the focus group sessions it was confirmed that "best" friends were an important influencing factor for males. The importance of "best" friends was not as clearly articulated by the females in the focus groups. Females often spoke about doing things with a group of friends versus just one friend. It would be interesting to collect more data in future research on the role of the adolescents' "best friend(s)" in relation to prevention, initiation and/or continuation of risk-taking behaviors.

Males in the study were more involved with sports than females. Although there was not a statistically significant difference this supports

previous research done by Health and Welfare Canada (1992) that revealed that adolescent females are less likely to be involved in sports, especially team activities, and that there was a decrease in participation in physical activities by females with age. The emphasis in the school systems and other organizations is to encourage more participation in physical activities throughout an individual's life to improve both physical and mental health. Clearly there is a need to encourage more young women to participate in activities during the adolescent time period to maintain and improve both long-term physical and mental health.

Other factors that were discussed during the focus group sessions in relation to influencing risk-taking behaviors included the developing roles and responsibilities of the adolescent: self, and self image, authority figures, rebellion, media, physical pressure, and stress/anxiety. These factors impacted on behaviors either positively or negatively. The importance of understanding the developmental stage and associated tasks was not considered to be fundamental information in relation to risk-taking behaviors was not clear until the focus group analysis. Although the researcher was aware of the fundamental tasks of adolescents it became apparent that these are very powerful determinants that could significantly influence behaviors.

Adolescents in all of the focus groups (both males and females) spoke about the importance of developing one's identity and needing to be accepted and "fitting in". The items in the questionnaire did not address these factors and it would be important to incorporate these influences in future questionnaires. In relation to developing an identity, one aspect that emerged from the data was body image. Body image was particularly important for the females in the focus groups. They spoke about looking good and being fit. Being physically active was not done to necessarily stay fit, but rather to be

part of the group.

The area of authority was another influence on adolescent behavior. Authority figures included parents, teachers and coaches. Adolescents in the focus groups spoke about pressures from authority figures to perform. These pressures were generally related to those individuals on team activities.

The focus group data also provided information regarding the influence of culture and society. One of the areas that was discussed in all of the focus group sessions was the importance of the media. The media has a powerful yet often missed impact on adolescents. Many of the adolescents stated that they did not believe that the media had a part to with their behavior, but then they spoke extensively regarding models, or specific TV shows or advertisements. It became apparent from the focus group data that the media messages are often subliminal and therefore the adolescents and others may not even be conscious of the effects on behavior.

In summary, both the questionnaire and the focus group session provided a wealth of information. While the questionnaire provided more data in regard to prevalence rates, and specific behaviors, the focus groups gave depth and breadth to risk-taking behaviors. Overall, influences on behavior identified in the focus groups included both cognitive and psychosocial dimensions. Cognitive dimensions included knowledge and beliefs related to the CVRF as discussed above. The psychosocial dimensions were based on the adolescents' stage of development, and included factors associated with . developing roles and responsibilities: formation of identity (self), intimate relationships, peer relationships and influence, authority, and society/culture. Focus group data in particular provided an opportunity to consider risk-taking behaviors from the perspective of the adolescent, keeping in mind the context in which risk-taking behaviors occur. This allowed the researcher to ground the

interpretation in relation to the developmental tasks and stages that the adolescents were facing.

Research Question #4: What are the views of adolescents regarding the influence of stress/anxiety on the CVRF of smoking and physical inactivity in themselves and other adolescents?

Stress/Anxiety

Understanding the influence of stress/anxiety on the CVRF of smoking and physical inactivity in adolescents seems a fairly straight forward statement, but during analysis it became apparent that the influence of stress/anxiety was complex and intertwined with all of the other influences that have been identified. As will be recalled from Chapter 2 the term anxiety was initially used, but this term was changed after pilot testing. Adolescents spoke about stress and anxiety as meaning the same thing. During the focus group data analysis it was apparent that although not all adolescents understood what anxiety meant, some did and used the term very appropriately. For example, one adolescent spoke about others exerting physical pressure on her to smoke, and how “scared” she was. Not only did she talk about anxiety, but her non-verbal responses (body language) also suggested an anxiety state even on recalling the events. Other females spoke about being anxious and wanting to fit in and smoking just to be accepted. For example, one female stated: “I think that with anxiety and wanting to fit in you turn around and you look at behaviors that are accepted by those people...”. It is interesting that some adolescents appeared to understand and were able to use the term anxiety appropriately, but yet many others only understood it to be the same thing as stress. On reflection and when talking with teachers regarding what is

presently addressed in the junior high curriculum, it became apparent that stress and anxiety are talked about in a variety of classes (Personal Communication, School Teachers, April, 1999). The term actually used within the curriculum is stress and this is more than likely why adolescents understand stress/anxiety to mean the same thing. What became obvious from this study is that however it is understood by the adolescents is how it needs to be approached. The listening to what was said and how it was said was fundamental in deciphering the issues and factors that caused adolescents to feel stressed/anxious.

The questionnaire data revealed that the major factors that caused stress/anxiety for males were: homework, exams and classmates; and for females were: exams, homework and parents. When looking at the focus group data, the stressors identified by the adolescents in the questionnaire results were expanded and it became clear that stress/anxiety was much more complex. For example, adolescents reported that homework and exams caused stress/anxiety, but it was related to the performance expectations of others (e.g., parents) in these areas. The most significant difference identified in the focus groups, but was not identified in the questionnaire, did not have anything to do with parents, homework or exams as being stressors. Rather, the most significant factor identified by the participants was the need to be accepted by peers. Peer group approval and acceptance routinely caused males and females to experience stress/anxiety. The literature also supports the importance of peer group approval and acceptance as factors that can lead to risk-taking behaviors (Gander & Gardiner, 1981; Hover & Gaffney, 1988; Michell & amos, 1997; Penny & Robinson, 1987). It is interesting to note that an item on the questionnaire did ask about peers as causing stress/anxiety. According to the questionnaire data analysis peers did not emerge as a

dominant factor that caused stress/anxiety. On further analysis it may be that the way the question is worded is misleading, but it seems more likely that adolescents do not fully comprehend and have not internalized what they believe is important. Many of the participants from the focus groups commented on how helpful the focus group discussions were and that they really did not know how and what their peers felt and believed. It was obvious that peers were extremely important to adolescents. It would make sense that in order to change any behavior, the influence of peers needs to be considered and steps need to be taken to incorporate peers into decision making and the development of strategies aimed at reducing risk-taking behaviors.

Another stressor that was closely linked to the theme of acceptance was image. A gender difference was detected in the experience of stress/anxiety in relation to image. Females spoke often in the focus groups about the importance of appearance. They felt a need to “look good” in order to “fit in”. Image was not identified as a stressor for the males. Males spoke instead about the importance of the appearance of females.

Females also initially referred to diet as an important factor to consider when dealing with heart health. On further discussion and analysis it became apparent that females referred to diet as it related to weight loss and appearance and not diet (and nutrition) as it related to a heart healthy lifestyle. This has implications for health education in the curriculum.

Other key information in this study included, the importance of confidentiality of information shared by the adolescents, the need of some adolescents to control certain situations and the need to *listen* to what the adolescent is saying. The importance of listening and respecting adolescents' views was strongly evident in all of the focus group sessions.

Participating in risk behaviors may be seen as a way to communicate by some adolescents. By engaging in behaviors that are normally prohibited the adolescents are “making a statement”. Understanding the importance of the behavior to the adolescent is essential in trying to deal with the problem.

Summary

In summary, valuable information was gathered from both the questionnaire and focus group sessions in relation to how adolescents perceive heart health and what influences the CVRF of smoking and physical activity/inactivity. One of the most unique outcomes from the questionnaire analysis was the examination of the multifactorial effects of risk-factors specific to CVD and the examination of smoking status by physical activity status. The questionnaire results in and by themselves were consistent with the literature findings in relation to prevalence, knowledge and influencing factors. The focus group data though, allowed for a much richer and more comprehensive understanding of the beliefs from the perspective of the adolescent than would have been possible with just one method.

In Chapter 2 a conceptual framework was developed that described how influencing behaviors and knowledge impacted risk-taking behaviors. Following analysis and reflection this conceptual framework has been revised to reflect the complexity of the variables discussed (Figure 3). During the analysis it was obvious that it was essential to understand adolescent development which included the cognitive knowledge and beliefs as well as the developing roles and responsibilities (self concept, body image, family/peer influence, stress/anxiety, authority, social/cultural). During development teens are faced with a number of decisions that they weigh carefully and consider both the costs and the benefits. Whether or not they participate in risk-taking behaviors

depends on not only their perception of the cost and benefits, but also on the influence of specific knowledge and the importance of other factors such as self concept or the media.

Beliefs, perceptions and knowledge are important variables that need to be understood from the perspective of the adolescent in order to develop effective programs aimed at preventing disease and maintaining and promoting heart health. Beliefs, perceptions and knowledge from adolescents can be used to develop strategies and heart health and smoking prevention and cessation programs for adolescents.

In conclusion, the development of programs related to CV health and in particular to the risk-taking behaviors of smoking and physical inactivity need to incorporate gender differences and adolescent knowledge, beliefs and roles and responsibilities. It is important that interventions to be based on the understanding of risk-taking behaviors from the perspective of the adolescent and not the perspective of the adult. One of the other key implications for practice is that it is essential to listen to the adolescents and allow them the opportunity to learn from each other. That is not to say that guidance is not important, but that the direction and discussion needs to come from the adolescents and nurses can assist in the facilitation of the process.

Another essential component for practice is that interventions and knowledge needs to be incorporated differently depending on the group. For instance, what and how a group of adolescent girls believe is important and be willing to discuss might be very different if those same girls were in a mixed group of both boys and girls. It is important to consider the context and other factors in all interventions and programs. The media is another example that has powerful, yet somewhat subliminal influence on adolescents. This influence must be carefully considered and incorporated into any CV programs.

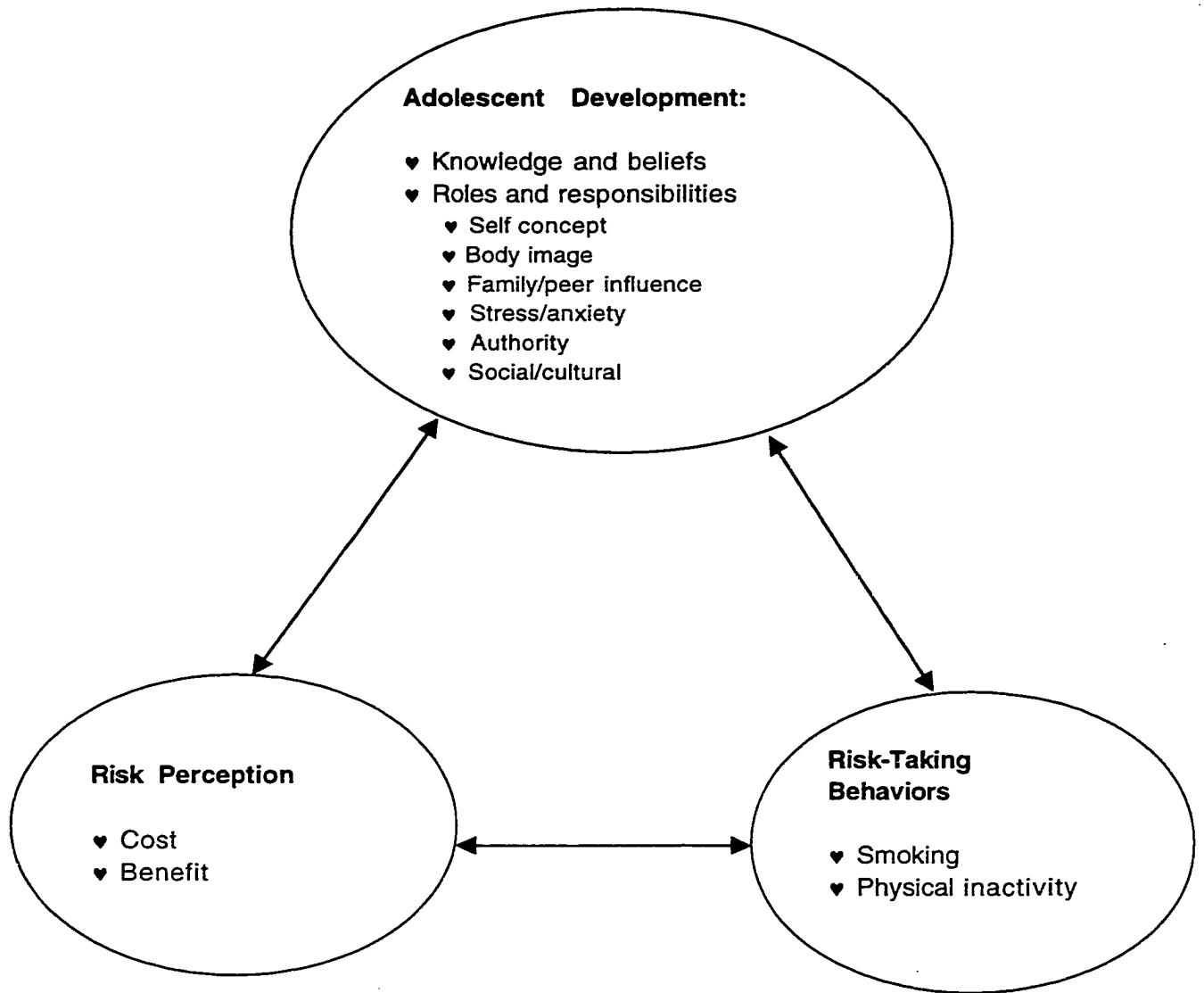


Figure 3. Revised Conceptual Framework – Adolescent Risk-Taking Behaviors.

programs.

Methodological Issues

A number of methodological issues became evident during the conduct of this study. These are outlined in the following discussion.

Sample

A total sample size of 57 adolescents was obtained from the target population of Grade 9 students in two urban Junior High Schools. The questionnaire was completed by all 57 adolescents and a sub-sample of 14 males and 21 females participated in focus groups. The original intent of the study was to have a sub-sample of adolescents who completed the questionnaire participate in three focus groups. In fact, four focus groups were formed because in the first all-female focus group some differences were noted and the investigator wanted to confirm those findings in another all-female focus group. Themes related to self-image and diet were identified in the first all-female focus group and were not emphasized to the same degree in either the all-male or mixed focus groups. An additional all-female focus group was added to validate findings of the previous all-female focus group.

The investigator had expected more adolescents to agree to participate than the 57 obtained. Possible reasons for this are reported under recruitment.

Recruitment

A number of issues arose in relation to recruitment of adolescents for the study. An unusually high absentee rate occurred during a severe flu epidemic when consents were handed out at the schools. Because of the high absentee rate it was difficult to determine who had and who had not received information letters and consent forms. The Grade 9 teachers and the Vice-

Principals of both schools were given extra information letters and consent forms for students who were absent on the days that the forms were distributed. Due to an ongoing high absentee rate it was hard to track students to ensure that all students received the information and consent forms and were given the opportunity to participate in the study.

In the second school, following the meeting with the Vice-Principal, the Grade 9 teachers and the students, both the investigator and the research assistant felt confident that adolescents in the classes seemed willing and eager to participate in the study. When the investigator returned in a week to collect the consents there was a surprisingly low number of completed consents. Only after meeting with school officials did it become apparent that a confidential incident within the school that week may have impacted the return of the consents. It was difficult to determine for certain whether the "incident" affected the response rate.

Another hindrance to recruitment was the process involved in obtaining consent. During the data collection phase a number of adolescents approached the investigator and stated they wanted to participate in the study. When informed that their consents had not been received, these adolescents informed us that they did not feel they needed to ask "permission" from their parents to participate in the study, and that they could provide their own consent. One particularly vocal adolescent stated that as she did not speak to her parents, why was she having to ask them for their approval to participate. Adolescents often feel the need for control and independence from authority figures (Curtis, 1992). The need for independence and control appeared to be a factor for many of the adolescents with whom the investigator interacted. The investigator did explain to the adolescents that although their point was understandable the necessary ethical obligation of the

researcher was to ensure that all consents had been completed and had signatures from the adolescent and their parent(s) or guardian.

Focus Group Issues

The audio taping of the focus groups allowed for the accurate documentation of the conversations of the adolescents, and it also allowed the observer to concentrate on the group dynamics, and verbal and nonverbal communication patterns. The tape recorder was non-intrusive and the microphone was situated in the centre of the focus group. Audio taping did have some limitations in that all the extraneous noises that occurred were also recorded. For instance, announcements from the over-head system occurred during all sessions and was extremely loud and disruptive. The extraneous noise that occurred made for difficulty transcribing.

A difficulty arose with respect to the quality of the audio tape recording with two of the focus group sessions. The tapes were taken to an expert on tape enhancement, who was able to enhance the voices on the tape so that they were clearly audible for the transcriber. The researcher did speak with the company that enhanced the tapes regarding confidentiality of the information on the tapes prior to releasing the tapes to them. This company had a history of working with confidential documents (e.g., police and lawyers).

It will be recalled that both a facilitator and an observer were present for each focus group session. The focus group facilitator for all four groups was the research assistant involved in the study. The observer on the pilot focus group and on the first two focus groups was the investigator. The last two focus group observations were done by a second research assistant who had experience in working with the investigator on other focus groups. Because of the change in the observer for the last two focus groups it became

important to clearly outline the expectations regarding the observer roles. Even with clear guidelines it was more difficult to get the same sense of understanding of the group dynamics from the last two focus groups. The investigator found that listening to the tapes from the sessions where she was not the observer was very important in that they she could hear the voices, their tone and expression and not only read the transcripts. Another important strategy was to talk with both the facilitator and the observer about what happened in the group. This was done immediately following the sessions as well as a few days later.

Strengths of the Study

The purpose of this exploratory, descriptive study was to add to the existing knowledge base regarding the CVRF of smoking and physical inactivity in the adolescent population. The data were collected using two collection methods. Triangulation of the study data collection tools which incorporated both quantitative (questionnaire) and qualitative (focus groups) methods enabled the integration of quantitative measures and the in-depth discussion and understanding of qualitative responses. This was especially helpful in understanding how adolescents perceived the CVRF of smoking and physical activity/inactivity and the influences of other variables (e.g., peers, stress/anxiety) on those risk factors.

The use of two methods gave a depth and breadth to the data that would not have been possible with using just one method. The questionnaire data were generally consistent with findings from other research studies. The focus group data allowed for an in-depth look at risk-taking behaviors and influences. The richness of the data would not have been possible with use of only one method.

Another strength of the study was the homogeneous group of teens. The mean age and demographic characteristics was similar for both males and females in the study, which allowed for comparisons within groups.

The focus group facilitator had excellent communication skills and was able to very quickly develop a trust relationship with the adolescents. She was able to keep the group centered on the issue being discussed and yet did not stifle ideas. Following the session the facilitator and observer both wrote out notes, which were very valuable in assisting recall of events and documentation of verbal and non-verbal behaviors. These also proved to be valuable in the analysis and discussion of the data.

The results of this study provide evidence that adolescents do have knowledge regarding risk factors, but knowledge is only one piece of the puzzle that is needed. Other factors that are essential to understand and incorporate are the developmental roles and responsibilities of adolescents. These roles and responsibilities included understanding of: self, intimate others (family and peer), peer relationships, authority, and society/cultural. Addressing these developmental areas helped put the risk-taking behaviors into context. A model to explain risk-taking behavior was developed from the data. This model incorporates the context, knowledge and beliefs, and developmental roles and responsibilities of adolescents and will help the development of more effective health promotion strategies, program planning, and healthy public policy aimed at reducing risk-taking behaviors.

Limitations of the Study

The study was limited with respect to the small number of smokers in the sample. It was difficult to draw meaningful conclusions with some of the questionnaire data because of the small cell sizes. The study was also limited

by the poor response. Due to the small cell size in some categories it is difficult to generalize any of the questionnaire data to the target population. However, despite the small sample size, the trends identified were consistent with data from larger national studies.

It is interesting to note that there were no Native American (also referred to as Aboriginal or Indigenous) adolescents who participated in the study, although there were Native Americans in the schools (percent of Native Americans in Grade 9 classes was not available). Approximately 54% of aboriginal people smoke (Health Canada, 1995). Aboriginal people, according to Canadian census data, primarily fall into three areas: First Nations, Métis, or Inuit (Health Canada, 1995). Smoking among Aboriginal youth varies by geographical location with the Northwest Territories having the highest rate of regular or occasional smokers (71% of Inuit, 63% of Dene/Métis, 43% of non-Native youth) (Health Canada, 1995). Caution also must be used in interpreting the findings of the present study in that the sample was small and is not necessarily representative of the population of Grade 9 adolescents. Certain nationalities are not represented or their representation is small.

Other limitations are in relation to the questionnaire. Despite the fact that the questionnaire was evaluated by experts and it was pilot tested by a group of adolescents, one of the questions on the questionnaire regarding why adolescents do not participate in physical activities caused confusion in regard to what was being asked. It was poorly answered and many adolescents left it blank. It would be important to reworded the question and evaluate it in a future study. The items in the questionnaire did address who influenced adolescents to smoke but it was limited in that it did not address what or who influenced those adolescents who did not smoke. It is just as important to understand why certain individuals do not participate in risk-taking behaviors as

it is to understand why others do participate.

Another limitation of the study was the sole use of only one of the Boards of Education for the recruitment of participants. It would be valuable to have groups from both school systems in order to compare results. Whether or not the philosophy of the different institutions would influence the CVRF is questionable and is one that should be studied.

In this study the focus groups were conducted in the schools. Two of the areas that were provided by the school officials were not the best suited for focus group sessions (i.e., library and counsellor's office) as was discussed in Chapter 6. Although it was unclear whether or not these rooms stifled discussion it would be important in future studies to organize rooms that are suitable for focus group sessions.

The literature refers to differences in cardiovascular risk factor profiles in urban and rural setting (Pebler et al., 1987; Rabbia et al., 1994). For this study the focus was limited to urban adolescents. It would be important to include rural students and compare findings at some point, but it was beyond the scope of the present study.

Major Findings

In conclusion, the present study has provided evidence that:

- No statistical difference is present between the numbers of male and female adolescents who are non-smokers, tried smoking but quit, or smokers.
- No statistical difference is present between the numbers of male and female adolescents who are inactive, moderately active, or very active.
- Adolescents who are very active or moderately active are often more likely to play computer games than are inactive adolescents.
- Adolescents can identify the risk factors associated with cardiovascular

disease but lack a depth of understanding regarding some of the risk factors and their effects on the heart.

- Adolescents believe heart disease is a disease of older people (>34 years).
- Adolescents know that their present behavior can have consequences for their health in the future.
- Adolescents have a sense of invulnerability.
- Adolescents in this study maintained moderate to active activity levels.
- Influences on adolescents *to not smoke* and to be physically active include: peer pressure/support, positive self-image, positive self-concept and self-esteem, parental support.
- Influences on adolescents to participate in risk-taking behaviors are complex and intertwined and include aspects related to knowledge and beliefs and developmental tasks and roles and responsibilities.
- Adolescent development (physically, cognitively, and psychosocially) plays an important role in understanding their decisions in participating in risk-taking behaviors.
- From the adolescent perspective participating in high-risk activities is a way to communicate.
- Peer pressure is extremely powerful and can be both positive and negative.
- Parental influence on risk-taking behaviors is not necessarily a linear relationship (i.e., parents smoke, therefore adolescent will smoke).
- Risk-taking behaviors is multifaceted and is uni-linear.
- The need for acceptance is extremely important for both males and females.
- Gender differences in group behavior is very important to consider in the development of CV programs.
- Stress/anxiety may be a factor that influences some adolescents to participate in risk-taking behaviors.

- Stress/anxiety is intertwined with other influences.
- Risk-taking behaviors for some individuals are a source of stress/anxiety.
- It was impossible to identify a simple linear cause and effect relationship in regard to stress/anxiety affecting smoking and physical activity/inactivity behaviors.
- The cause and effect relationship was not uni-directional, in that behaviors could lead to stress/anxiety, but stress/anxiety could also lead to changes in behavior. Moreover, it is impossible to separate out the stress/anxiety from the behaviors.

Directions for Further Research

Further study with adolescents with a refined tool that includes more questions related to developmental tasks and issues would be helpful in extending the knowledge base regarding factors influencing the CVRF of smoking and physical activity/inactivity. Understanding how adolescents feel, what they believe and the impact of normal stressors will give a better understanding of strategies to develop programs to improve heart health. Researchers must take into account possible differences based on stage of development and gender.

It would be important in future studies to establish adequate sample sizes in different categories (age and gender) by doing a power calculation in order to better describe differences between groups with some level of confidence. Expansion ought to include more ethnic groups including Native American youth since reported smoking rate is high in this group. Another important consideration is that age-specific statistics are needed in relation to risk-taking behaviors. For example, how many adolescents age 10, 11, 12, 13, and 14, smoke, instead of categorizing them all in age 10-14.

Another area for nursing research would be to more clearly understand why adolescents do not take up smoking, and are physically inactive. Nurses also need to become more active in conducting research aimed at preventing CVD. A question for further investigation is what factors influence adolescents' understanding of risk factors and how they affect the heart; or why they think that they are invulnerable and that heart disease would not happen to them.

Summary

This study has shown that as in recent national studies there is a alarming increase in smoking in adolescents and in females in particular. This has tremendous cardiovascular health and cost implications for the health care system for the future. The outcome of this increase in risk-taking behavior if not quickly and efficiently reduced will create devastating increases in cardiovascular mortality and morbidity.

There is increasing awareness in the literature that promotion and prevention of CVD needs to begin earlier in life. It is paramount that nurses understand that knowledge in itself is not enough for behavior change. This research study has clearly supported this belief. Understanding the importance of the behavior to the adolescent while keeping in mind their developmental stage and the associated cognitive ability and roles and responsibilities, is essential in trying to deal with risk factors. A conceptual model that describes the factors involved in risk-taking behavior from the perspective of the adolescent has been developed. Investment in the development of strategies, policies, and programs for health promotion and prevention of CVD early in life should be based on sound research which examines the variables and influences from a variety of perspectives.

This study highlights the importance of understanding CVD from the

adolescent perspective, and its application to program planning and healthy public policy. It is also important to keep in mind gender differences that are present and the influence on risk-taking behaviors.

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APPENDIX A

Letter to Teachers

TO: (Teacher)

DATE: February 11, 1998

FROM: Karen L. Then
RN, MN, Ph.D(C)

RE: Research Study and Consent Forms
"Cardiovascular Risk Factors in Adolescents"

Good Morning. I am a registered nurse, a parent and a Ph.D. Candidate in the Faculty of Nursing, University of Alberta and Associate Professor, Faculty of Nursing, University of Calgary. This morning my research assistant or I will be talking to all Grade 9 students about participating in the above research study. This study has been accepted by the Catholic School Board and has also been discussed and accepted by (*Principal of School*) and (*School*) parent council.

I collected data in other schools before Christmas and found that the teachers were extremely helpful in reminding students about the study. I found that when it came to the actual data collection time many students came forward and also wanted to be part of the group, but they could not because they had not completed the consent form with their parent or guardian. The students who did participate had an opportunity to give information regarding their beliefs and understanding regarding the risk factors or smoking, physical inactivity and stress on the body overall, but specifically on the cardiac system. The study is in two parts. The first is a questionnaire that all students who agree to participate will be given. The second is focus group discussions with selected students (based on gender) to discuss in depth some of their beliefs and understanding or risk factors and their significance.

Students will be given consent forms this morning to take home and complete with their parent or guardian. Your assistance in encouraging students to return these consents forms over the next week would be greatly appreciated. I have arranged with the School that the completed consent forms are to be returned to the student's Home Room Teacher. I will pick them up next Wednesday the 18th of February. Following this I will arrange with the principal and vice principal and the teachers times, etc for the data collection.

I realize that during the term your teaching and other commitments keep you very busy and I would really like to express my appreciation for your help in this project. If you have any questions or concerns or hear of any, please don't hesitate to contact me at 220-8542. I have left some extra copies of the consent at the main office if students lose their copy and need to take a new one home. I would really appreciate your help in encouraging students to return these consent forms. I have also given you a copy of all the forms that the students have received.

Thank-you for your assistance in this project! It is greatly appreciated.

Karen L. Then (RN, MN, Ph.D. Student)

APPENDIX B

Risk Factor Questionnaires

Original & Revised

Date: _____

Code #: _____

Name _____

Original Risk Factor Questionnaire

1. What was your age at your last birthday (years): _____
2. Sex (Check **one**): 1. Male 2. Female
3. Occupation of Parents:
 1. Mother: _____ 1. Full Time 2. Part Time 3. Not employed
 2. Father: _____ 1. Full Time 2. Part Time 3. Not employed
4. Do you receive an allowance? (Check \surd **one**) 1. Yes 2. No
5. If Yes, do you receive your allowance (Check \surd **one**):
 1. Daily
 2. Weekly
 3. Monthly
 4. Other (specify) _____
6. If you receive an allowance as indicated above, how much do you receive each time? (Check \surd **one**).

 1. Less than \$5.00
 2. \$6.00 - 10.00
 3. \$11.00 - 20.00
 4. \$ > \$20.00
7. Do you have a job? (Check \surd **one**) 1. Yes 2. No
8. If yes, how many hours a week do you work? _____
9. Have any of your family ever had a heart problem? (Check \surd **one**):
 1. Yes 2. No 3. Don't Know

10. If yes to number 10. Who in your family has heart problems?
(Check \checkmark all that apply)

1. Father
2. Mother
3. Brother
4. Sister
5. Aunt or Uncle
6. Grandmother
7. Grandfather
8. Other (please specify)_____

11. Have you ever smoked a cigarette, even a puff? (Check \checkmark one)
1. Yes 2. No

12. If yes to number 12.

How old were you when you took a puff or started smoking? ____Years

13. In your house, who smokes? (Check \checkmark all that apply)

- | | |
|------------------|--------------------|
| 1. No one smokes | 5. Sister (s) |
| 2. Mother | 6. Other Relatives |
| 3. Father | 7. Other(s) |
| 4. Brother(s) | |

14. How many people in total smoke in your house ? _____

15. How many close friends do you have? _____

16. How many of your close friends smoke? (Check \checkmark one only)

1. None
2. Some (less than half)
3. Most (more than half)
4. All

17. If you have ever smoked: When you **first** tried cigarettes who did you smoke with?

1. By myself
2. With friends
3. With my brother or sister
4. Other (please indicate)_____

18. If you have smoked, have you continued to smoke even occasionally?
(Check **one**)

1. Yes
2. No

If no please go to question number 23

19. If you have continued to smoke who do you smoke with now?

1. Myself
2. Friends
3. My brother or sister
4. Other (please indicate)_____

20. What is the **most important** reason for you to keep smoking?
(Check **one** only)

Because:

1. I enjoy it
2. It makes me feel grown up
3. It helps me stay slim
4. It is relaxing
5. My friends smoke
6. I feel the urge
7. Other _____

21. In the past month, how many days did you smoke one or more cigarettes?

1. None
2. 1-5 days
3. 6-10 days
4. 11-20 days
5. 21-29 days
6. 30 days (every day)

22. On those days that you smoked, how many cigarettes did you usually smoke each day? (Check \checkmark **one** only)

1. I didn't smoke in the last 30 days
2. 5 or less cigarettes each day
3. 6-10 cigarettes each day
4. 11-15 cigarettes each day
5. 16-20 cigarettes each day
6. 21-25 cigarettes each day
7. More than 25 cigarettes each day

23. What health problems do you think could be caused by cigarette smoke in a smoker?
(Check \checkmark **as many** as you think apply).

- | | |
|------------------|---|
| 1. None | 7. Arthritis |
| 2. Lung cancer | 8. Lung Disease (Bronchitis, Asthma, Emphysema) |
| 3. Other cancer | 9. Low birth weight babies |
| 4. Diabetes | 10. Less energy/strength |
| 5. Heart disease | 11. Other (Describe) _____ |
| 6. Stroke | |

24. Which of the sports listed below have you played or actively participated in during the last 6 months? (Check \checkmark **as many** as apply).

- | | | | |
|---------------|---------------------|---------------------|----------------------------|
| 1. Aerobics | 7. Gymnastics | 13. Skating | 19. Tennis/Racquet sports |
| 2. Baseball | 8. Jogging | 14. Skiing | 20. Volleyball |
| 3. Basketball | 9. Hiking | 15. Soccer | 21. Walking for fitness |
| 4. Bicycling | 10. Hockey | 16. Roller-blading | 22. Weight training |
| 5. Football | 11. Horse Riding | 17. Swimming | 23. Other sports (specify) |
| 6. Golf | 12. Sailing/boating | 18. Track and field | _____ |

25. Overall, would you describe yourself as someone who enjoys sports and physical activity a lot, a bit, not much, or not at all? (Check \checkmark **only one**)
I enjoy sports and physical activity:

1. A lot
2. A bit
3. Not much
4. Not at all

29. What are the health benefits of physical activity? (Check \checkmark as many as you think apply).

1. Increased mobility
2. Breathing
3. Prevents heart disease
4. Sense of feeling "good"
5. Relieves tension/anxiety
6. Prevents bone problems
7. Weight loss
8. Prevents lung disease (Bronchitis, Asthma, Emphysema)
9. Reduces blood pressure
10. Energy/strength
11. Other (Describe)_____

30. How often do the following people encourage you to participate in sports or other physical activities? (Please **check** \checkmark **one** box for each person listed).

Person	Often	Some-times	Never	Don't Know	Don't Have
Mother					
Father					
Brother(s)					
Sister(s)					
Best Friend					
Teachers)					

31. How often do the people who are close to you take part in sports or other physical activities? (Please **check** \checkmark **one** box for each person listed).

Person	Often	Sometimes	Never	Don't Know	Don't Have
Mother					
Father					
Brother(s)					
Sister(s)					
Best Friend					
Teachers)					

32. How important are each of the following reasons for liking and participating in physical activity. (Please **check** \checkmark **one** box for each reason listed).

I like to participate in physical activity:

Reason	Not Important (1)	Fairly Important (2)	Important (3)	Very important (4)
To have fun				
Be good at activity				
To win				
To see friends				
To improve my health				
To get in good shape				
To look good				
To make new friends				
To enjoy the feeling of using my body				
To be like a sports star				
To please my parents				

33. How many hours a week to you do the following activities?
(Please **check** \surd **one** box answer for each activity listed).

ACTIVITY	Not at all	Less than 1 hour	1 - 3 hours	4 - 6 hours	7 - 9 hours	10 + hours
Watch Television						
Watch VCR/Movies						
Play Computer Games						

Date: _____

Code #: _____

Name _____

Revised Risk Factor Questionnaire

1. What was your age at your last birthday (years): _____
2. Sex (Check **one**): 1. Male 2. Female
3. Occupation of Parents:
 1. Mother: _____ 1. Full Time 2. Part Time 3. Not employed
 2. Father: _____ 1. Full Time 2. Part Time 3. Not employed
4. What is your racial background? (Check \checkmark **one**):
 1. White
 2. Black (African American)
 3. Asian
 4. Native American
 5. Other (Please Specify) _____
5. Do you receive an allowance? (Check \checkmark **one**) 1. Yes 2. No
6. If Yes, do you receive your allowance (Check \checkmark **one**):
 1. Daily
 2. Weekly
 3. Monthly
 4. Other (specify) _____
7. If you receive an allowance as indicated above, how much do you receive each time? (Check \checkmark **one**).
 1. Less than \$5.00
 2. \$6.00 - 10.00
 3. \$11.00 - 20.00
 4. Greater than \$20.00
8. Do you have a job? (Check \checkmark **one**) 1. Yes 2. No
9. If yes, how many hours a week do you work? _____

10. Have any of your family ever had a heart problem? (Check \checkmark **one**):

1. Yes 2. No 3. Don't Know

11. If yes to number 10. Who in your family has heart problems?
(Check \checkmark **all** that apply)

1. Father
2. Mother
3. Brother
4. Sister
5. Aunt or Uncle
6. Grandmother
7. Grandfather
8. Other (please specify)_____

12. Have you ever smoked a cigarette, even a puff? (Check \checkmark **one**)

1. Yes 2. No

13. If yes to number 12.

How old were you when you took a puff or started smoking? ___years

14. In your house, who smokes? (Check \checkmark **all** that apply)

1. No one smokes 5. Sister (s)
2. Mother 6. Other Relatives
3. Father 7. Other(s)
4. Brother(s)

15. How many people in total smoke in your house ? _____

16. How many close friends do you have? _____
(friends that you associate with regularly, give a specific number)

17. How many of your close friends smoke? (Check \checkmark **one** only)

1. None
2. Some (less than half)
3. Most (more than half)
4. All

18. If you have ever smoked: When you **first** tried cigarettes who did you smoke with?

1. By myself
2. With friends
3. With my brother or sister
4. Other (please indicate) _____

19. If you have smoked, have you continued to smoke even occasionally?

(Check **one**)

1. Yes
2. No

If you answered no to number 19 please go to question number 24.

20. If you have continued to smoke who do you smoke with now?

1. Myself
2. Friends
3. My brother or sister
4. Other (please indicate) _____

21. What is the **most important** reason for you to keep smoking?

(Check **one** only)

Because:

1. I enjoy it
2. It makes me feel grown up
3. It helps me stay slim
4. It is relaxing
5. My friends smoke
6. I feel the urge
7. Other _____

22. In the past month, how many days did you smoke one or more cigarettes?

1. None
2. 1-5 days
3. 6-10 days
4. 11-20 days
5. 21-29 days
6. 30 days (every day)

23. On those days that you smoked, how many cigarettes did you usually smoke each day? (Check \checkmark **one** only)

1. I didn't smoke in the last 30 days
2. 5 or less cigarettes each day
3. 6-10 cigarettes each day
4. 11-15 cigarettes each day
5. 16-20 cigarettes each day
6. 21-25 cigarettes each day
7. More than 25 cigarettes each day

24. What health problems do you think could be caused by cigarette smoke in a smoker?

(Check \checkmark **as many** as you think apply).

- | | |
|------------------|---|
| 1. None | 7. Arthritis |
| 2. Lung cancer | 8. Lung Disease (Bronchitis, Asthma, Emphysema) |
| 3. Other cancer | 9. Low birth weight babies |
| 4. Diabetes | 10. Less energy/strength |
| 5. Heart disease | 11. Other (Describe) _____ |
| 6. Stroke | |

25. Which of the sports listed below have you played or actively participated in during the last 6 months? (Check \checkmark **as many** as apply).

- | | | | |
|---------------|---------------------|---------------------|-------------------------------------|
| 1. Aerobics | 7. Gymnastics | 13. Skating | 19. Tennis/Racquet sports |
| 2. Baseball | 8. Jogging | 14. Skiing | 20. Volleyball |
| 3. Basketball | 9. Hiking | 15. Soccer | 21. Walking for fitness |
| 4. Bicycling | 10. Hockey | 16. Roller-blading | 22. Weight training |
| 5. Football | 11. Horse Riding | 17. Swimming | 23. Snow Boarding |
| 6. Golf | 12. Sailing/boating | 18. Track and field | 24. Other sports (specify)
_____ |

26. Overall, would you describe yourself as someone who enjoys sports and physical activity a lot, a bit, not much, or not at all? (Check \checkmark **only one**)
I enjoy sports and physical activity:

1. A lot
2. A bit
3. Not much
4. Not at all

30. What are the health benefits of physical activity? (Check \checkmark as many as you think apply).

1. Increased mobility
2. Breathing
3. Prevents heart disease
4. Sense of feeling "good"
5. Relieves tension/anxiety
6. Prevents bone problems
7. Weight loss
8. Prevents lung disease (Bronchitis, Asthma, Emphysema)
9. Reduces blood pressure
10. Energy/strength
11. Other (Describe) _____

31. How often do the following people encourage you to participate in sports or other physical activities? (Please check \checkmark one box for each person listed).

Person	Often	Some-times	Never	Don't Know	Don't Have
Mother					
Father					
Brother(s)					
Sister(s)					
Best Friend					
Teachers)					

32. How often do the people who are close to you take part in sports or other physical activities? (Please check \checkmark one box for each person listed).

Person	Often	Sometimes	Never	Don't Know	Don't Have
Mother					
Father					
Brother(s)					
Sister(s)					
Best Friend					
Teachers)					

33. How important are each of the following reasons for liking and participating in physical activity. (Please check \checkmark one box for each reason listed).

I like to participate in physical activity:

Reason	Not Important (1)	Fairly Important (2)	Important (3)	Very important (4)
To have fun				
Be good at activity				
To win				
To see friends				
To improve my health				
To get in good shape				
To look good				
To make new friends				
To enjoy the feeling of using my body				
To be like a sports star				
To please my parents				

34. How many hours a week to you do the following activities?
(Please **check** \checkmark **one** box answer for each activity listed).

ACTIVITY	Not at all	Less than 1 hour	1 - 3 hours	4 - 6 hours	7 - 9 hours	10 + hours
Watch Television						
Watch VCR/Movies						
Play Computer Games						

35. On average, how many times do you feel stressed or anxious in a week?
(Please **check** \checkmark **one** only).

1. None
2. 1-3 times/week
3. 4-6 times/week
4. more than 7 times/week

36. Which of the following make you stressed or anxious (Please **check** \checkmark **all** those that apply).

1. homework
2. teachers
3. classmates
4. brothers or sisters
5. friends
6. parents
7. exams
8. other (please specify) _____

- 37.** Choose your top 3 stressors, or factors that make you anxious from the list below. Place the number 1 against your top stressor, the number 2 against your second stressor and the number 3 against your third stressor.

- _____ 1. homework
- _____ 2. teachers
- _____ 3. classmates
- _____ 4. brothers or sisters
- _____ 5. friends
- _____ 6. parents
- _____ 7. exams
- _____ 8. other (please specify)_____

- 38.** What do you do when you feel stressed or anxious (Please **check** **all those that apply**).

- 1. work out
- 2. break my curfew
- 3. go for a walk
- 4. talk to a teacher
- 5. yell or get angry
- 6. fight with my parents
- 7. drink alcohol
- 8. listen to music
- 9. smoke
- 10. watch TV
- 11. use drugs
- 12. talk to my mother
- 13. talk to a brother or a sister
- 14. eat
- 15. talk to my best friend
- 16. become aggressive (for example hitting someone/something)
- 17. pray
- 18. talk to my father
- 19. talk to my guidance counselor
- 20. Other: (Please specify)_____

THANK-YOU

APPENDIX C

Focus Group Questions

Focus Group Questions

The following questions have been developed to help guide the focus group discussions. These questions are meant to be prompts only and the direction and development of further questions will depend on the participants within each focus group. Some differences may arise regarding areas of focus depending on the ages, and gender of the participants. Therefore, these questions are guiding questions only.

Introduction

- ♥ welcomes participants to the group and thanks them for coming
- ♥ advises group of refreshments and encourages them to help themselves before the session begins
- ♥ ensures that everyone has a name tag that facilitator and observer can see clearly
- ♥ introduces self (facilitator) and observer to the group
- ♥ provides broad statement of the objective of the focus group (e.g., discussion regarding heart health)
- ♥ introduce recording process (tape recording and observer recording) to capture important points of discussion
- ♥ set ground rules for the session (e.g., no right or wrong answers; interested in participant's feelings and beliefs about the topic, both positive and negative; comments made during the discussion are to be kept confidential; if you do not understand what is being asked, please ask for clarification)

Questions

- 1. What do you need to do to keep your heart healthy?**
(differences between females and males, ages, beliefs, may also include risk factors)
- 2. Who do you think gets heart disease and when does it start?**
(knowledge of risk factors developing over time, beliefs re death, illness, timing)
- 3. How important are these factors (as identified above) for you now? Why?**

4. What behaviors do you see adolescents participating in that might influence their heart health? Expand.

5. Why do adolescents participate or not participate in high risk behaviors (e.g., peer pressure, parents, anxiety, etc.)?

(why do adolescents smoke, why do they not participate in physical activity)

What does peer pressure mean to you? How does it affect you?

What influences you to participate or not to participate in physical activity and smoking? How do the behaviors of other individuals influence you?

6. Which people have the greatest influence on you? Do other peoples choices make a difference to you?

7. Does being anxious affect physical activity or smoking behaviors? Why or why not? How?

8. What sorts of things make adolescents/you anxious (nervous/tense/apprehensive)? What do adolescents/you do when you are anxious? (relate to physical activity or smoking behaviors)

9. Do you think being anxious affects your heart? Why or why not? How?

Wrap-Up

In summary, what are the **key factors** that you believe about keeping your heart healthy? **Summarize**

Based on the discussion today about keeping your heart healthy what is one thing that you really like about yourself? Why? and What is one thing that you would like to change? Why? (Have students take a few minutes to write down their answer and hand in)

- ♥ Thank everyone for coming and participating
- ♥ Ask group members not to discuss session with anyone who might be involved in the next group
- ♥ Remind group that comments said in the group are to remain confidential.

APPENDIX D

Post Focus Group Forms/Questions

Post Focus Group Forms/Questions

1. From your perspective, what was valuable about participating in this project?
2. What is one thing that you really like about yourself? Why?
3. What is one thing that you would like to change about yourself? Why?
4. Is there anything else you would like to tell us?

Thank-you for coming and being willing to participate in this session!

APPENDIX E

Letter to Parents

Letter To Parents

February 11, 1998

Dear Parent/Guardian:

I am a registered nurse, a parent and a Ph.D. candidate in the Faculty of Nursing, University of Alberta and Associate Professor, Faculty of Nursing, University of Calgary. Your teen is a member of a class of Grade nine students I have invited to participate in this research study. The purpose of the study is to assess adolescent's knowledge and understanding of the risk factors of physical activity, anxiety and smoking in relation to keeping one's heart healthy. Behaviors related to these risk factors will also be explored.

Each of the students who agrees to participate in my study will be given a questionnaire to complete and may be asked to participate in one group interview aimed at exploring opinions and beliefs regarding heart health in adolescents. The groups will consist of six to eight students from Grade 9, and will be held at the school at a time arranged with them and their teachers.

Would you please consider the attached consent form where you may indicate permission for your teen to participate in this study. Your teen is also being asked whether he/she wishes to participate. In the study students will be assured that their beliefs, behaviors and experience will be kept confidential from both teachers and parents by not attaching names to any forms or documentation. I will be talking with many students who may or may not be physically active, smoke or have anxiety. Your child's interest in being in this study does not indicate that he/she is participating in any of the above behaviors.

If you have any questions, please do not hesitate to call me at 220-8542 or my supervisor Dr. T. Davis at (403) 492-0300. If you and your teen agree to participate, please complete with your teen the **blue** consent form attached (the white is for you to keep) and have them return this consent form in the envelope provided by **Wednesday February 18, 1998** to the teen's home room teacher.

Your teen's participation in this study is very valuable. I hope the study will make an important contribution to the health of adolescents in the future and as they become adults.

Your response is important to the success of the study.
I thank you in advance for your consideration.

Sincerely,

Karen L. Then RN, BN, MN
Ph.D. Candidate, Faculty of Nursing
University of Alberta

cc. (____), Principal
School Name

APPENDIX F

Consent Forms

Consent Form

Research Project Title: Cardiovascular Risk Factors in Adolescents

Investigators: Karen L. Then (RN, Ph.D Candidate & Associate Professor, Faculty of Nursing, University of Calgary),
Dr. T. Davis (Professor, Faculty of Nursing, University of Alberta)

Sponsor: Heart and Stroke Foundation of Canada,
Faculty of Nursing, University of Alberta

This consent form, a copy of which has been given to you, or your agreement to be in this study is only part of informed consent. The form should give you a sense of what the research is about and what your teenager's or your participation will involve. If you would like to know more about the study please feel free to ask. Please take the time to read this carefully.

The purpose of this study is to assess knowledge and understanding of the risk factors of physical activity and smoking, and the influencing factor of anxiety in relation to keeping one's heart healthy. Behaviors related to these risk factors will also be explored. This will be done with groups of Grade 9 students of all males, all females, or a mix of males and females. Once students consent forms are submitted they will be randomly selected and assigned to specific groups. All adolescents willing to participate will be given a questionnaire to complete and may also be selected to participate in a group interview.

Students will be given a survey to complete which will take approximately 15 minutes and following this some individuals will participate in a group interview. The group interview will be approximately 1 hour in length. Students will be asked questions about smoking, physical inactivity and anxiety. They will be asked questions related to their beliefs about why adolescents participate or not participate in these behaviors and whether or not anxiety plays a part in their behaviors.

Being part of this study is voluntary. Students who are part of the study will be asked to express their opinions and beliefs. The focus group sessions will be audio-taped.

The information from the survey and the focus groups will be analyzed using a code number for each student. Only Karen Then (Ph.D. Candidate), her supervisory committee members and the focus group facilitator will have access to the raw information from the survey and the focus group interviews. The list of students in the groups and the audio-tapes will be destroyed after the study is done. If published, the results will be presented such that no individual teen will be identifiable.

Your signature on this form indicates that you understand to your satisfaction the information about having your teen participate in this project. This does not change

your legal rights nor release the researchers, sponsor, or involved institutions from their legal and professional responsibilities. You are free to withdraw your teen and your teen is free to withdraw from the study at any time. If you have any further questions concerning matters related to this research, please contact:

Karen Then (220-8542) or Dr. T. Davis (403- 492-5920).

If you or your teen have any questions concerning your rights regarding participation in this research, please contact the Office of the Vice-President (Research) and ask for Karen McDermid (220-3331).

Please See Next Page

Consent Form

A. To be filled out by the parent: (Please check one)

I **give** my permission for my teen to participate in the research project
" Cardiovascular Risk Factors in Adolescents." _____(Please **check**)

Student's Name: _____

Parent's Signature: _____

Date: _____

I **do not** give my permission for my teen to participate in the research
project " Cardiovascular Risk Factors in Adolescents." _____(Please **check**
if you do not wish your teen to participate)

B. To be filled out by the student: (Please check one)

I **would** like to participate in the study _____(Please **check**)

Please sign your name below and ask an adult (teacher, parent) to sign as a witness.
Karen Then will sign under investigator and then give you a copy of this form.

Student Signature

Date

Witness

Date

Investigator Signature

Date

I **do not** want to participate in the study _____(Please **check**)

If you agree to participate in the study you will receive a letter through the school that
will tell you when your group interview will be. Please don't hesitate to ask if you have
any questions.

Thank You.

APPENDIX G

Reminder Letter to Parents/Adolescents

February 27, 1998

Dear Grade 9 Students & Parents:

Re: Reminder to Return Completed Consent Forms

Recently you should have received a letter and consent form for the study "Cardiovascular Risk Factors in Adolescents". This study is being done in a number of schools in the region. Your assistance and support in this study would be really appreciated.

I have received a number of responses from parents and their teens and I would like to thank those that have returned these forms. I realize that this is a very busy time and that a number of forms may have been put aside or mislaid. I would really like to have parents and teens who have not completed the consent form to just take a minute and read the letter and return the response. Your participation in this study is needed in order for health professionals to address health needs in the adolescent population. Only with a better understanding of these issues from the adolescent perspective will we be able to develop programs to meet the needs of this group.

If any part of the consent is unclear, or you have any questions please don't hesitate to call me at 220-8542. Please submit the consent forms back to the Grade 9 Home Room Teacher, by **Wednesday, March 4, 1998**. If you have mislaid the form I have left more at the main office or you may write a note to me giving your consent. Participation includes the students completing a questionnaire about physical activity, tobacco and stress(anxiety). I am wanting their opinions about what is important and why. Students do not have to be participating or not participating in any of the activities, all they have to do is share their opinions and beliefs. Some students will also be selected to be part of a group interview.

Thank-you for your help in this valuable work.

Sincerely,

Karen L. Then RN, MN, Ph.D(C)