University of Alberta

Physical Activity and Working Women: Implications Towards Program Development in the Workplace

by

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Dedication

Para ti mãe: a inspiração que deu vida au este trabalho.
Eu te-amo.

For you mother: the inspiration that gave life to this work.
I love you.

Abstract

This research was designed to provide directions for developing a workplace physical activity (PA) program that is responsive to individual and environmental factors across groups of employed women *with* children and *without* children. Two studies were undertaken. In Study 1, four social-cognitive theories were examined to explain PA behaviour among women with children (n=302) and without children (n=881). In Study 2, qualitative data from four focus groups with employed women (n=30) and interviews with senior personnel (n=4) was analyzed to determine psychosocial and environmental factors related to PA behaviour among women. Study 1 results suggested operationalizing intentions and self-efficacy, providing social support, eliminating barriers, and promoting benefits of PA when implementing programs. Study 2 results revealed that cultural norms, social support, tailoring to employees' needs, and providing appropriate resources, are core workplace program components. Implications for the workplace along with recommendations for further research, practice, and policy development are provided.

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Chapter 1- Introduction

1.1. Overview of chapter

This chapter provides an overview of the issues surrounding physical activity and related health matters with respect to women and employed work. The rationale for this research including the study purpose is also presented. A plan of the thesis will follow to help guide the reader.

1.2. Introduction

Physical inactivity prevalence and disease

Physical activity has been recognized as an important strategy for health promotion and disease prevention (Eyler et al., 1998; United States Department of Health and Human Services [USDHHS], 1996). Although there are physiological, psychological, and social benefits gained from physical activity, 56% of the Canadian adult population are sedentary (Craig & Cameron, 2004). Men are more active than women; 59% of women do not engage in regular leisure-time physical activity compared to 52% of men (Cameron, Craig, Stephens, & Ready, 2002). Furthermore, data from the Canadian Community Health Survey (Statistics Canada, 2001), indicate 57% of females and 50% of males 12 years of age and older are physically inactive. Gender differences are most pronounced among older adults, where 67% of women are sedentary compared with 55% of men (Cameron et al).

Physical inactivity is a significant risk factor for both cardiovascular disease (CVD) (Health Canada, 2001; Heart and Stroke Foundation of Canada, 1997) and diabetes (Brandenburg, Lindenfeld, Reusch & Regensteiner, 2003; Dominiczak, 2003;

Toobert, Strycker, Glasgow, Barrera & Bagdade, 2002). CVD is the leading cause of death among women and men in industrialized countries (Health Canada; Heart and Stroke Foundation of Canada). Indeed 37% of all Canadian women's deaths are CVD-related compared to 35% for men (Heart and Stroke Foundation of Canada, 2003). Further, diabetes increases the chances of incurring CVD (Brandenburg et al.; Dominiczak; Toobert et al.). The incidence of diagnosed diabetes has increased among those 45 years and older from 6.6% in 1994 to 8.2% in 2002 (Canadian Fitness and Lifestyle Research Institute [CFLRI], 2004). The survival rate among women with type 2 diabetes has been found to decrease 3 to 5 fold as compared to pre-menopausal, non-diabetic women and men (Brandenburg et al.; Toobert et al.). Although the prevalence of diabetes is higher among men, when compared to women between the ages of 55-64, the absolute differences are small (10% among men and 7% among women) (CFLRI). If these current trends continue, the impact of diabetes and CVD is likely to increase, as the majority of the aging population will be women (Brandenburg et al.).

Physical inactivity and interventions for women

As an independent risk factor for CVD, the high rates of physical inactivity among women increase the need for interventions and programs in this area (Krummel et al., 2001). Women have consistently reported less regular physical activity than men (Eyler et al., 2002a; 2002b), and the prevalence is further decreased among women who are socially disadvantaged when considering education, socioeconomic status, age, family status and ethnicity (Eyler et al., 2002a; 2002b). The use of behavioural change theory to design physical activity interventions is a method of examining salient

strategies to increase participation (Dishman, Oldenburg, O'Neal, & Shephard, 1998; Marcus, Pinto, Simkin, Audrain, & Taylor, 1994; Peterson & Aldana, 1999). Further, the adoption of a healthier lifestyle by incorporating more activity (from walking to vigorous activity), and establishing an improved diet, has been shown to substantially reduce the incidence of CVD related events (Manson et al., 2002) and type 2 diabetes in particular (Hu et al., 2001) for women.

Employment and workplace implications

The workplace has been recognized as an important channel for the promotion of physical activity among adults (USDHHS, 1996). Within the workplace there is the potential to reach a large percentage of the target population with established communication and support networks, as well as the opportunity to develop corporate norms for behaviours and a sense of overall well-being (Plotnikoff & Moodie, 2002).

Work plays an important role in many women's lives. Now more than ever, women are participating in paid employment in addition to their family and household duties (Gjerdingen, McGovern, Bekker, Lundberg, Willemsen, 2000; Statistics Canada, 1996; 2000; 2004). An increased growth in the employment rate of women with children in particular has occurred over the last 25 years (Statistics Canada, 2004). Although more women overall are in the employed workforce, they still perform the majority of family and household duties in comparison to men (Clark, 2001; Gjerdingen et al.; Statistics Canada, 1996; 2000; 2004; Women's Health Surveillance Report, 2003). These women are also more likely than men to report a lack of time due to work as a barrier to their physical activity (Cameron et al., 2002).

Consequently, employed women, particularly those with multiple roles (partner, parent, paid employee), are exposed to stressors (e.g., increased physical and mental ailments, menstrual disorders, CVD, musculoskeletal problems, depression, and anxiety) that may have implications for their physical activity behaviours and overall well-being (Barnes, Pase & VanLeeuwen, 1999; Gjerdingen et al., 2000). Many of these employed women undergo more life-changing events that can impact their health, than men or non-employed women (Barnes et al.; Gjerdingen et al.). For example, employed women do more work than men (approximately 5-15 hours more per week) (Barnes et al.; Gjerdingen et al.). This work is diffusely distributed between their job, household, and childcare responsibilities. Mothers caring for young children are particularly affected (Gjerdingen et al.; Statistics Canada, 1996). Additionally, 38% of married mothers employed full-time report that they experience serious levels of stress because of time demands, compared to 20% of women without children (Statistics Canada, 2000). However, parental status has been reported to have little effect on the stress levels among men (Statistics Canada, 2000). Furthermore, 46% of employed men report no sick days as compared to 38% of women who are more likely to report absenteeism rates of six or more days per year (Cameron et al).

1.3.Rationale for the study

The promotion of physical activity for CVD and diabetes prevention among employed women is of critical interest. Unfortunately, women as a group have been under-researched (Marcus, Pinto, Simkin, Audrain & Taylor, 1994; Plotnikoff, Hugo, Wielgosz, Wilson, MacQuarrie, 2000), and the effects of CVD (Krummel et al., 2001)

and diabetes prevention strategies targeting women (Brandenburg et al., 2003), has been inappropriately understudied in the workplace domain. Although women have been included in several social-cognitive and behavioural health promotion studies, gender differences have not been systematically examined, particularly in response to intervention strategies (Marcus, Dubbert, King & Pinto, 1995). Most of the current knowledge in this area is primarily based on studies examining associations between physical activity and chronic disease among Caucasian males (Women's Health Surveillance Report, 2003). Moreover, many study reports in the physical activity domain are generally based on leisure-time physical activity (LTPA), with activities performed at work or in the home not being captured through current Canadian surveillance systems (Women's Health Surveillance report, 2003) and other pertinent research studies.

Further, there is a gap in knowledge surrounding the socio-environmental determinants of physical activity for women of various socio-cultural backgrounds throughout the lifespan (Women's Health Surveillance report, 2003). There has been limited research that focuses on the priorities and needs of these women. Furthermore, the results are not being adequately communicated to women in formats that are understandable, appropriate and useable (Women's Health Surveillance Report, 2003). As a result, our understanding of women and physical activity has not advanced at the pace needed to meet the public health recommendations put forward by the Surgeon General (National Centre for Chronic Disease Prevention, 1999) and other health authorities (Women's Health Surveillance Report).

Thus, recent recommendations have highlighted the need to target studies aimed at decreasing the barriers for women as a marginalized group among Canadians

(Women's Health Surveillance Report, 2003). Women make health decisions while considering the social and economic environments in which they live and work (e.g., their families, their care-giving and interpersonal relationships) before considering themselves (Women's Health Surveillance Report). Integrating approaches of individual lifestyle change while addressing issues related to creating supportive environments for women in various life stages is a suggested strategy for future work in this area.

Specifically, prospective work should aim to focus on the gap that remains within the research literature concerning employed women and workplace physical activity programs. The extent of participation, effectiveness, and quality of workplace physical activity programs is limited in part by important factors unique to women (e.g., women with/without children) (Verhoef & Love, 1992; 1994). Demographic differences among women are often not recognized and can have implications for the planning of physical activity programs in the workplace (Marcus et al., 1994; Miller, Stewart, Trost, & Brown, 2002; Verhoef & Love, 1992; 1994).

1.4. Purpose of the study

The purpose of this study is to provide directions towards developing a physical activity program for employed women that is responsive to individual (e.g., psychosocial, behavioural factors) and environmental factors (e.g., physical, social, organizational, community, policy) across different demographic groups (i.e., women *with* children and, women *without* children, who are single or have partner status). In other words, *what would workplace physical activity programs look like for the working-woman?*

1.5. Plan of the Thesis

This thesis is comprised of two research studies. In Study 1 four theories (e.g., Transtheoretical Model [TTM], Theory of Planned Behaviour [TPB], Protection Motivation Theory [PMT], and Social Cognitive Theory [SCT]) were analyzed for their capacity to explain physical activity behaviour among employed women with and without children. In Study 2 data collected from four focus groups with employed women, and interview data with senior personnel were used to explore the main psychosocial and environmental factors for explaining physical activity behaviour among women with and without children. Each study will be presented as an independent manuscript and will include its own introduction, methods, results, and discussion sections. Some repetition between the sections is to be expected due to the overlapping of information between thesis chapters.

Following this introductory chapter, the remaining sections of the thesis will include: (i) a review of the pertinent literature and research questions pertaining to Study 1 and Study 2, (Chapter 2), (ii) Study 1 (Manuscript 1- Chapter 3), (iii) Study 2 (Manuscript 2- Chapter 4), (iv) a conclusion chapter synthesizing the two research studies, including study limitations, implications, and recommendations for future research, practice, and policy (Chapter 5), (v) Appendix I that includes methodological details from both studies, and (vi), Appendix II that provides the study instruments.

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Chapter 2- Literature Review

2.1. Outline of Chapter

The objective of the literature review is to examine a comprehensive range of dimensions that may provide insight into the characteristics of successful physical activity programs for working-women. Specifically, issues that are relevant to individual- and environmental- level factors for different demographic groups are reviewed.

Each section of this chapter identifies pertinent issues and gaps within the literature that need to be addressed. Due to the complex nature of the research topic, overlapping information between the outlined sections is to be expected.

A review of the literature will follow concentrating on: 1) a brief introduction focusing on the issues most pertinent to women within the physical activity and workplace literature, 2) intra-personal and environmental factors influencing women's physical activity behaviours including multiple role status, 3) the influence of multiple roles on employed women's wellbeing, particularly the issues surrounding cardiovascular disease (CVD)/diabetes, 4) workplace physical activity and ecological frameworks and, 5) social-cognitive theories related to physical activity. The chapter will conclude with a summary of the gaps outlined in the review, the aim of the thesis, and the research questions pertaining to Study 1 and Study 2.

2.2. Introduction: an overview of women and physical activity

Chronic disease and physical activity promotion

Cardiovascular disease (CVD) contributes to high mortality rates (36% in Canada) (Heart and Stroke Foundation, 2003), and with the prevalence of diabetes on the rise (Centers for Disease Control and Prevention, 2005; Tanuseputro, Manuel, Leung, Nguyen, & Johansen, 2003), the benefits (e.g., physiological, psychological, and overall quality of life) that one can obtain from performing healthy physical activity are well established (Anderson et al., 1999; Cameron, Craig, Stephens, & Ready, 2002; Heart and Stroke Foundation; Oguma & Shinoda-Tagawa, 2004; Plotnikoff, Hugo, Wielgosz, Wilson & MacQuarrie, 2000; Plotnikoff, Hugo & Cousineau, 2001; Statistics Canada, 2001). As a result, the examination and dissemination of strategies to improve the activity levels of the population has become one of the forefronts of health reform agendas nationally, and internationally (Health Canada, 2001; National Advisory Committee on Health and Disability, 1998; US Department of Health and Human Services [USDHHS], 1996; 2000; Women's Health Surveillance Report, 2003).

Although the benefits of physical activity to prevent disease (particularly CVD and its related risk factors) are well known, the majority of women are physically inactive when compared to men throughout the lifespan (Heart and Stroke Foundation, 1997; 2003; Statistics Canada, 2001). However, it is encouraging to note that women have closed the gap relative to men in achieving leisure time physical activity (LTPA) (e.g., physical activity performed during spare time) (Statistics Canada). While this evidence is positive, there have been minimal data to facilitate our understanding of the multifaceted factors that promote or hinder physical activity participation among women (Marcus,

Dubbert, King, & Pinto, 1995; Women's Health Surveillance Report, 2003). Results from a review on physical activity and mortality indicate that physically active women significantly postpone mortality compared with inactive women (Oguma, Sesso, Paffenbarger, & Lee, 2002), however, there are gender differences, as well as disparities among women in different life stages that have yet to be fully explored. The available evidence from a recent meta-analysis suggests that physical activity should be promoted differently with men and women and among women in particular (Oguma & Shinoda-Tagawa, 2004). For example, the multiple roles that many women engage in can impact whether physical activity is achieved, and the amount of activity undertaken (Verhoef & Love, 1992).

Further, the factors that contribute to physical activity adherence are known to be different depending on the type of activity performed (Marcus et al., 1995). For example, the knowledge of promoting exercise has been primarily derived from research conducted on males or mixed male and female samples where vigorous exercise has been the dependent variable under study (Marcus et al.; Marcus & Forsyth, 1998). However, research has shown that women may adhere better to moderate forms of exercise or leisure-time physical activity LTPA that offers flexibility around their daily schedules (Marcus et al.; Marcus & Forsyth, 1998; Oguma et al., 2002).

Most recently, studies exploring non-traditional forms of physical activity or physical activities of daily living (PADL) (such as occupational activity, and household chores) as an alternative method of activity promotion, may be best suited for some women (Salmon, Owen, Bauman, Schmitz, & Booth, 2000). The combination of both LTPA and PADL classifications may accurately represent women's physical activity

behaviours. In particular, health promotion messages that recognize both traditional and non-traditional forms of physical activity may be more appropriate among women with multiple roles and responsibilities, such as employed mothers with young children (Miller, Stewart, Trost, & Brown, 2002; Salmon et al.; Women's Health Surveillance Report, 2003).

The elevated prevalence of physical inactivity among women in comparison to men, in part reflects the narrowness of previous physical activity definitions (Oguma & Shinoda-Tagawa, 2004; Pate et al., 1995). Although certain messages supporting high intensity activities may over time have a beneficial effect on health status, these messages could be regarded as an unattainable goal for some of the population (Oguma & Shinoda-Tagawa; Pate et al.; Women's Health Surveillance Report, 2003). For example, previous guidelines from the American College of Sports Medicine (ACSM) state that 20-60 minutes of sustained moderate to high intensity endurance exercise needs to be performed 3-5 days per week (Pate et al.). These guidelines were based on scientific studies composed primarily of men and consequently do not integrate the full range of women's physical activities; women are more likely to participate in activities that are moderate in intensity (Oguma & Shinoda-Tagawa; Pate et al.; Pinto, Marcus & Clark, 1996; Scharff, Homan, Kreuter, & Brennan, 1999). In addition, the traditional definition of exercise as used by clinical researchers does not accommodate PADL (Scarff et al.). PADL is particularly important for employed women since 57% of women work outside of the home while continuing to perform the majority of household responsibilities (Scarff et al.).

As a result of women consistently reporting lower rates of LTPA than men (Eyler et al., 2002a; 2002b; Oguma & Shinoda-Tagawa, 2004), several challenges have been considered for research: (1) using questionnaires on leisure time physical activity to determine overall levels of physical activity may not be sufficient for many women who may not perceive time spent in leisure due to their busy schedules (Eyler et al., 2002a; 2002b), (2) the type of activities assessed may not take in to consideration specific socio-environmental influences (Eyler et al., 2002a; 2002b), and (3), there is a lack of data based on a comprehensive definition of physical activity that includes activity during leisure time, on the job, and around the house (Brownson et al., 2000; Oguma & Shinoda-Tagawa).

In response to the existing evidence on the health benefits of performing physical activities that are moderate in intensity and sporadic in duration, the concepts of LTPA and PADL have been adopted by the ACSM, the Center for Disease Control and Prevention (CDC), and the Surgeon General in their recommendations: adults should accommodate at least 30 minutes of physical activity on most, if not all, days of the week (Pate et al., 1995; USDHHS, 1996). The new ACSM, CDC and the Surgeon General's recommendations have important implications for women since women's lifestyles may more easily incorporate short bouts of activity throughout the day rather than a designated portion of time for continuous activity (Pinto et al., 1996; Wilbur, Miller, Montgomery & Chandler, 1998).

Workplace interventions: taking on both an individual and socio-environmental perspective

Interventions within the workplace have been recognized as a pivotal setting to promote physical activity since a large proportion of the population are participating in paid employment and spend a substantial amount of time at work (Health Canada, 2001). In fact, many Canadians are working longer hours and spend most of their waking day at work (Cameron et al., 2002). Women in particular are participating in employed work more than ever before, including a growing number of women with young children (Gjerdingen, McGovern, Bekker, Lundberg, Willemsen, 2000).

Today, however, the daily lives of working women are being shaped by social and corporate trends that often restrict, rather than encourage, physical activity (Marcus et al., 1995). The pressure to succeed in an exceedingly competitive and not always supportive society, has resulted in many women minimizing their needs to be healthy in lieu of taking on multiple roles to take care of others (Gjerdingen et al., 2000; Marcus et al.). In light of these roles, the social experience of being a woman can often be associated with disease and it is important to look at the ways in which this issue develops and how it can be alleviated (Emslie, Hunt, & Macintyre, 1999).

While several studies have explored the barriers women face in their attempt to incorporate more physical activity in their life, these factors have not been fully addressed in workplace interventions at the individual and social level (Marcus et al., 1995; Women's Health Surveillance Report, 2003). Further, although the trend for workplace health and wellness has achieved greater recognition in recent years, few organizations have adopted this regime into their work culture, which has minimized

employees' access to physical activity programs at work (Cameron et al., 2002). Research is clearly required to examine employed women's socio-cognitions and the environmental influences of the workplace.

In recognizing women's needs and daily life situations, one essential question then follows: for the working-woman, what should workplace physical activity programs look like that recognize and support both individual and societal influences on everyday life? To further explore this issue, the remaining sections of the chapter will detail: 1) intra-personal and environmental factors influencing women's physical activity behaviours including multiple role status, 2) the influence of multiple roles on employed women's wellbeing, particularly the issues surrounding CVD/diabetes, 3) workplace physical activity and ecological frameworks, and 4), social-cognitive theories.

2.3. Intra-personal and environmental factors influencing women's physical activity behaviours including multiple role status

Participation in physical activity is closely related to personal, social, and economic factors (Women's Health Surveillance Report, 2003). The factors influencing women's readiness to change physical activity behaviour can be classified as intra-personal and socio-environmental (Eyler et al., 2002a; 2002b; Women's Health Surveillance Report). These factors can present themselves as determinants of health in various settings and can have varied implications on wellbeing (Women's Health Surveillance Report). Within the workplace for example, the lack of flex-time policies (e.g., socio-environmental) may cause a single woman with children (e.g., intra-personal) and no childcare support (e.g., socio-environmental) to experience challenges balancing

work and home responsibilities. The challenges of both these intra-personal and socio-environmental factors may then create a substantial barrier to achieving healthy behaviour change, particularly increasing physical activity. This scenario poses as a significant concern for many women, since there are currently 81% of single-parent families that are headed by women in comparison to 19% by men (Statistics Canada, 2001).

Intra-personal factors

There are several intra-personal factors that have been associated with women's physical activity behaviours including: race/ethnicity, education, age, income, attitudes, beliefs, knowledge, perceived health and actual health status, past and current health behaviours, self-efficacy, stress, employment and marital status (Eyler et al., 2002a; 2002b). Among the most consistent correlates of physical activity among women are race/ethnicity, education, age, and income. For example, comparison studies among different racial/ethnic groups have demonstrated that white women are more likely to participate in LTPA than other groups (Eyler et al., 2002a; 2002b; King et al., 2000; Sternfeld, Ainsworth, & Quesenberry, 1999). Also, a higher education level is usually reported to be positively associated with women's physical activity (Eyler et al., 2002a; 2002b; King et al.; Sternfeld et al.). Furthermore, older age and low income have most often been negatively associated with physical activity among women (Eyler et al., 2002a; 2002b; King et al.; Sternfeld et al.).

Other intra-personal factors such as pessimistic attitudes and beliefs (e.g., perceiving greater barriers than benefits to being physically active), lack of knowledge,

poor perceptions of personal health, poor self-esteem and feelings of stress have all been commonly reported as negatively influencing women's physical activity behaviours (Eyler et al., 1998; Eyler et al., 2002a; 2002b; King et al., 2000; Sternfeld et al., 1999). These findings appear to be consistent across demographically diverse samples of women (Eyler et al., 1998; Eyler et al., 2002a; 2002b; King et al.), although, calls have been made for more research within the physical activity literature among minority women (Eyler et al., 1998; Eyler et al., 2002a; 2002b; King et al.).

Inconsistent results have been reported among women and physical activity correlate studies when employment status is considered. There is evidence to suggest that the degree to which employment correlates to women's physical activity behaviours may depend on the socio-cultural context and the types of physical activity examined. For example, correlates of LTPA have been found to differ from PADL as raising young children and other care-giving responsibilities may increase household physical activity but hinder LTPA such as participation in sports or exercise (Sternfeld et al., 1999). Furthermore, minority and low-income groups have reported LTPA as an unaffordable indulgence (Sternfeld et al.). This is highlighted in Salmon and colleagues' study findings where women in blue-collar occupations demonstrated low levels of LTPA, but achieved greater physical activity levels when LTPA was coupled with PADL. Additionally, in a study examining physical activity among a diverse sample of women aged 40 and over, King and colleagues (2000), did not find an association between employment and physical activity. However, a similar study reported that being employed increased the likelihood of white women participating in exercise/LTPA (Sternfeld et al., 1999). In this study, there was no significant relationship found among employed African-American,

Hispanic, and Asian women participating in LTPA. Although, unemployed women from these ethnic groups were found to most likely participate in PADL such as household and care-giving activities.

A review of the correlate studies examining physical activity among women has also demonstrated inconsistent results when marital status is considered. For example, King and colleagues' (2000) study found no relationship between marital status and physical activity that included both LTPA and PADL across a diverse sample of women. Yet, other studies have found that being married was negatively associated with levels of LTPA/exercise (Eyler et al., 1998; Schmitz, French, & Jeffery, 1997; Sternfeld et al., 1999; Sternfeld, Cauley, Harlow, Liu, & Lee, 2000). Furthermore, when considering PADL with LTPA, an additional study revealed that married women achieve adequate levels of total physical activity according to the ACSM and CDC recommendations (Scharff et al., 1999). Similar to the employment factor detailed above, the results of these studies may be confounded by the socio-cultural context and the type of activity examined.

Socio-environmental factors

There are also several socio-environmental factors influencing women's physical activity behaviours including: social support from family, friends, and co-workers, family structure (e.g., raising young children), the physical environment, and policy. In addition, physical activity levels are lower among those who are most socially disadvantaged across a variety of these factors, and may differ depending on the type of activity examined (e.g., LTPA or PADL) (Eyler et al., 2002a; 2002b). For example, the

absence of, or the inadequacy of social support, (Eyler et al., 1999) while raising young children, have been found to deter women from LTPA (Eyler et al., 1998; 2002a; 2002b; 2003; Miller et al., 2002; Sternfeld et al., 1999; Verhoef & Love, 1992; 1994). Moreover, the number of young children may also have an impact on the amount of LTPA achieved (Eyler et al., 2003). Those with two or more children have reported less physical activity than women with only one child (Eyler et al., 2003). However, when PADLs are considered as part of a women's physical activity regime, these socio-environmental factors may not play as significant a role in influencing activity levels since PADL are typical of a women's day. This is highlighted in Scharff and colleagues' (1999) study examining the factors associated with women's physical activity behaviours. In this study, LTPA was reported to be negatively influenced by the presence of young children in the home, however, in considering PADL, a positive relationship to achieving exercise was revealed.

The physical environment and policy have received less empirical attention than other socio-environmental factors associated with women's physical activity behaviour (Eyler 2002a; 2002b). Results from qualitative data conducted with women suggest that elements of the physical environment and policy factors can facilitate physical activity behaviours (Eyler et al., 1998; 2002a; 2002b). However, these domains are less understood and further research is required.

In summary, many of the intra-personal and socio-environmental factors influencing physical activity for women can pose potential barriers that need to be addressed in program interventions (Eyler et al., 1998; 2002a; 2002b; Pinto et al., 1996).

The most commonly identified intra-personal barriers to increasing physical activity for women include: race/cultural issues related to language, health concerns such as fatigue and fear of injury, lack of knowledge, and the absence of motivation. Common socio-environmental barriers include: limitations of program options, inadequacy of time due to family and work responsibilities, lack of social support, lack of child care resources, the shortage of access to gender sensitive programs/safe places to exercise, and lack of flex time at work to exercise (Eyler et al., 1998; 2002a; 2002b; Pinto et al.; Women's Health Surveillance Report, 2003).

Multiple role status and physical activity behaviours

Both intra-personal and socio-environmental factors influencing women's physical activity behaviors have also been found to vary across life situations and the changing roles that accompany the lifespan (Scharff et al., 1999). Specifically, life stages and the multiple roles that many women take on, can have a significant impact on behaviour (Marcus & Forsyth, 1998). As suggested earlier, age, marital status, motherhood, and partaking in the workforce have been associated with low levels of physical activity. Mothers perceive more barriers to exercise participation than women without children (Miller et al., 2002; Verhoef & Love, 1992; 1994). Also, older women tend to view physical activity as less enjoyable and beneficial than younger women who tend to have higher self-efficacy for physical activity (Scharff et al.). For older women, fear of injury and poor health are more likely to be perceived as barriers when compared to younger women (Scharff et al.). In a study examining women in early and middle adulthood (the period in which the range of roles is largest), parenthood as well as role

overload (employment status, marital status, and parenthood combined) were found to be negatively related to the amount of exercise achieved (Verhoef & Love, 1992). Results from a similar study indicated that women's socio-cultural circumstances, particularly parenthood itself, may have implications for planning physical activity programs (Verhoef & Love, 1994). Additionally, Wilbur et al., (1998), examined the physical activity patterns of occupational, household and leisure activity among employed women (n= 176) aged 35-65 years. In this study, 34% of women reported following a continuous pattern of leisure activity while 75% followed a continuous pattern of household activity. These results suggested that women may be able to obtain the recommended levels of physical activity from a combination of household, occupational, and leisure activities.

Although there is research indicating an association between women's multiple social roles during the lifespan and physical activity behaviour, it is unclear how the workplace environment and related activities may play a part in influencing overall physical activity behaviour for women in combination with her other social roles and responsibilities. Until now, health promotion activities addressing physical activity and disease have neglected the entire range of the social and cultural pressures that shape women's participation (Women's Health Surveillance Report, 2003). For example, it is uncertain how program planning should aim to address the social roles that women, and specifically employed women experience during their daily life. The factors influencing women's participation in activity that allows for their life-stage and multiple role status requires further exploration (Scharff et al., 1999). Consequently, there is insufficient evidence to develop workplace physical activity interventions and programs specifically for women.

2.4. The influence of multiple roles on employed women's wellbeing, cardiovascular disease, and diabetes

Multiple roles and employed women's wellbeing

The effect of multiple responsibilities on employed women's well-being is controversial (Women's Health Surveillance Report, 2003). Studies investigating women's social roles have recognized that these roles affect their mental and physical health, yet, it is remains unclear whether these effects are beneficial or harmful (Stuart & Garrison, 2002; Women's Health Surveillance Report). Generally, these studies have examined two opposing theories to examine women's well-being with respect to their social roles: role overload or role strain theory and role balance/enhancement theory (Steptoe, Lundwall, Cropley, 2000; Stuart & Garrison; Women's Health Surveillance Report).

Role overload/role strain theory suggests that women with multiple roles may experience role conflicts (e.g., life events and daily hassles causing stress among competing roles where there is limited psychosocial resources), posing harmful affects to their mental and physical health (Steptoe et al., 2000; Stuart & Garrison, 2002; Women's Health Surveillance Report, 2003). This may be the case specifically for employed women who have partners and child care responsibilities where higher rates of distress may be exhibited, especially if social support for these multiple roles does not exist (Barnes, Pase, & VanLeeuwen, 1999). This is of significant concern since women are less likely to be employed full-time, and are more likely to have their working life interrupted by pregnancy and caring responsibilities (Women's Health

Surveillance Report). Alternatively, roles that are in balance pose as an enhancement to health by buffering negative stress, increasing self-esteem, decreasing depression, and increasing social contacts (Steptoe et al.; Stuart & Garrison; Women's Health Surveillance Report).

There is also evidence to suggest that each social role may act independently to provide either beneficial or harmful effects to health. The effects of balancing these roles are dependent on the specific characteristics of each role, the combinations of the roles, and the socio-economic context (e.g., as women's education and income levels rise there tends to be a decrease in negative stress) (Women's Health Surveillance Report, 2003). For example, Stuart & Garrison (2002), indicated that finding balance across roles led mothers with grade school children to be physically and mentally healthier when compared to the mothers who were engaged in few roles. Yet, in a study examining the relationships between gender, work, and health, Emslie and colleagues (1999), concluded that it is how women experience their paid work that is most predictive of their health status rather than if employees are male or female, married or not, and whether they are parents.

Similarly, Steptoe and colleagues' (2002) study findings supported the role balance/enhancement theory for individuals who are working, married parents. No gender differences were found when examining the influence of multiple social roles on cardiovascular activity during the working day and evening among men and women. The results were attributed to both men and women being equally represented in their social roles. High levels of social support among participants moderated the effect of social role influences on blood pressure.

An additional study examined the role of work conditions in mediating the effect of employment status on married women's psychological wellbeing. The extent to which the employee is responsible for things outside of her control and the amount of routine involved, were found to be associated with depressive symptoms (Lennon, 1994). This research underscored the negative influence of excess family demands and poor job situations on employed women's wellbeing. Lennon, described women's "social positions" as not "...simply categorical identities or roles..." (p. 243). Social roles were recognized as structuring the content of daily life by shaping the day-to-day experiences and challenges confronting women, which in turn influences psychological wellness and functioning.

From a broad social perspective, employed women's social roles and wellbeing has also been influenced by: the spending priorities of governments; the extent to which services provide for women's needs and interests; and the degree to which women are supported in moves towards equity (Raphael, 2002). According to a comparative policy analysis of Canadian women's quality of life, women's total work time (e.g., paid and unpaid work such as household and care-giving duties) is coupled with the inadequate policies that support compatibility of work and bringing up children in Canada (Raphael). The report denotes Canadian provincial governments as not providing enough subsidized child-care for most families who still must use private and unregulated child-care services. Further, employees' quest for family-friendly workplaces on the part of employers was found to provide minimal evidence for aiding the child-care dilemma in Canada.

In summary, the benefits to wellbeing for women participating in physical activity may be limited when negative attributes of their individual social roles are experienced (e.g., excess stress, time demands). The limited support women receive from their broader social context (e.g., limited workplace and government policy and programs) may also counteract positive gains to wellbeing. The influence of social roles, particularly role overload and balancing roles on physical activity, requires further study.

Cardiovascular disease and diabetes: Introduction to prevention and treatment issues

In response to women's quality of life issues, studies have recognized the importance of CVD (Elliot, 1995; Mosca, McGillen & Rubenfire, 1998; Plotnikoff et al., 2000; 2001) and diabetes prevention and treatment (Brandenburg, Lindenfeld, Reusch, & Regensteiner, 2003; Cuff et al., 2003; Tanuseputro et al., 2003). Although there has been a decline in mortality rates from CVD among Canadian women over the last 30-40 years, this reduction has been evident to a greater degree among men and individuals (men and women) of North-Western European ancestry (Women's Health Surveillance Report, 2003).

CVD and diabetes affect women differently than men. For example, CVD causes the highest death rates among women as compared to men with increasing age (Heart and Stroke Foundation, 1997; 2003), and diabetes as a risk-factor for CVD has shown to contribute to these fatality rates among women (Brandenburg et al., 2003; Women's Health Surveillance Report, 2003). Certain risk factors for CVD and diabetes are more prevalent among women (Brandenburg et al., 2003; Plotnikoff et al., 2001; Women's Health Surveillance Report, 2003). In addition to being more physically inactive than

men, women report a wider range of symptoms (e.g., having high blood pressure, depression), are less likely to seek medical care and have treatment (e.g., more often it is women who are widowed or isolated and cope on their own), and are less often included in research studies (Mosca et al., 1998; Toobert, Strycker, Glasgow, Barrera, & Bagdade, 2002; Plotnikoff et al. 2001; Women's Health Surveillance Report). There are also physiological risk factors that are different for women than men that occur through decreased protective hormone mechanisms such as oral contraceptive use, pregnancy, and menopause (Plotnikoff et al., 2000; 2001).

The social and economic costs that are associated with CVD and its related risk factors also have been recognized as affecting women in particular. Women with multiple roles, particularly those with children and low incomes, low education and poor social support are particularly vulnerable for acquiring CVD (Plotnikoff et al., 2000; 2001; Women's Health Surveillance Report, 2003). Additionally, women in poor physical environments, with limited access to the appropriate health services are also at risk for CVD (Plotnikoff et al., 2000; 2001; Women's Health Surveillance Report).

Cardiovascular disease

As a result of the risk factor prevalence among women, various studies have covered a range of topics relating to women's health with respect to CVD such as: psychosocial stress (Elliot, 1995), gender differences (Mosca et al., 1998) and barriers to lifestyle change (Hu et al., 2001), physical activity behaviour change strategies (Anderson et al., 1999; Dunn et al., 1999; Hu et al., 2001; Krummel et al., 2001;

Manson et al., 2002; Plotnikoff et al., 2001; Toobert et al., 2002) and policy development (Plotnikoff et al., 2000; Whitlock & Williams, 2003).

The relationship between psychosocial stress and heart health has reported to be dependent upon the individual's meaning and perception of their life situation (Elliot, 1995). Given that psychosocial stress is a potential risk factor for women with changing roles over her life span, Elliot (1995), has emphasized perceived environmental stress, as well as the individual's perceptions of health, as factors that may influence wellbeing. This finding is also consistent with other studies examining the beneficial influence of social support on reducing the risk of CVD among women (Eyler et al., 1999; Toobert et al., 2002). Among these studies, women receiving social support report less feelings of psychosocial stress and more positive perceptions of their life situation than women who perceive a lack of social support.

The gender differences in barriers to lifestyle change for CVD prevention found in a study conducted by Mosca and colleagues (1998), helped to identify important psychosocial factors that should be considered for future programs designed in this area. In this study, women more than men reported self-esteem as the most important barrier for lifestyle change. Money, knowledge, skills, and stress were also noted as significant barriers, and these barriers were rated higher among women. In comparing social support systems, physicians were regarded as the most important source of support for both women and men. However, women more than men, ranked dietitians, exercise physiologists, nurses, counsellors, family members and social or religious groups as more important sources of support.

Gender differences also exist among men and women patients with heart disease when examining the barriers they experience to changing their physical activity behaviour (Toobert et al., 1998). In addition to experiencing greater symptoms and severity, women have rated themselves more poorly in functional limitation and capability. Women have also expressed greater difficulty in performing daily activities, and having greater time conflicts (Toobert et al.).

Physical activity is cited as an effective intervention to decrease the risk factor prevalence of CVD (Anderson, et al., 1999; Dunn et al., 1999; Manson, et al., 2002; Oguma & Shinoda-Tagawa, 2004; Plotnikoff et al., 2000; 2001). Walking, and vigorous activity have been associated with CVD risk reductions irrespective of ethnicity, age and body-mass index (Manson et al.). In addition, a combination of diet with moderate lifestyle activity, and/or structured exercise programs have been found to improve health for both obese women (Anderson et al.) and in previously sedentary healthy women (Dunn et al.).

Prevention of CVD has been recognized in various recommendations within the women's health literature, particularly in response to the need for further policy development. CVD has been documented as a woman's health issue that requires further attention from governments, health care providers, and workplaces (Plotnikoff et al., 2000; Whitlock & Williams, 2003; Women's Health Surveillance Report, 2003). For example, Plotnikoff and colleagues (2000), include the promotion of physical activity as one of the key recommendations for health professionals to reduce CVD among women in Canada. Further, the Women's Health Surveillance Report, recommends that attention be paid to the unique circumstances of women of diverse

cultural and social backgrounds, by recognizing the "rampant" inequities in health care access and provision through more inclusive policies (p.6). Policy efforts that limit barriers and encourage physical activity by utilizing a "multiplicity of approaches," are also considered among the recommendations (p.6).

While there is an established dose-response relationship between physical activity and the reduced risk of CVD among women, there are still many barriers that women face in adopting and maintaining this behaviour to achieve its benefits (Oguma & Shinoda-Tagawa, 2004). The success of physical activity promotion would benefit from a greater examination of the dynamics between nutritional, psychological, political, and the socio-environmental factors that influence physical activity behaviour amid women (Oguma & Shinoda-Tagawa). In addition, a recent evidence-based review has highlighted physical activity promotion programs tailored to the specific interest, preferences, and readiness for change as a strong recommendation to limit barriers towards achieving primary prevention of CVD among women (Whitlock & Williams, 2003).

Diabetes

In comparison to CVD and physical activity studies among women, there is much less data available on women related to physical activity and the prevention and treatment of diabetes (Cuff et al., 2003; Hu et al., 2001; Toobert et al., 2002). In one study, adding resistance training to aerobic exercise routines was found to enhance glucose disposal in postmenopausal women with type 2 diabetes (Cuff et al.). Although the combined training modes resulted in improvements with insulin sensitivity, more

research is warranted to determine how these different modalities can be incorporated among women with type 2 diabetes across life stages. Further analysis is also needed with respect to modes of physical activity behaviour that consider the short bouts of activity many women experience throughout the day.

Other research on women and diabetes has indicated that a combination of lifestyle factors (e.g., physical activity, a healthy diet, restricted alcohol consumption, and non smoking) (Hu et al., 2003), stress management and social support (Toobert et al., 2002) may prevent the majority of type 2 diabetes cases. Interventions based on these lifestyle and social factors have also improved long-term maintenance of healthy behaviours to prevent the incidence of diabetes when guided by behavioural theory (Toobert et al.). The evidence in this area shows promising results and points to key directions for further work combining multi-dimensional interventions, specifically using theory as a process of determining best strategies and as a method of evaluation.

In brief, although this review of the literature has covered a variety of studies with respect to both the prevention and treatment of CVD and diabetes among women, there has been limited research focussing on female samples in comparison to men. Among women in particular, more information on risk factor incidence and prevalence across the lifespan is required (Women's Health Surveillance Report, 2003). Moreover, there is a need to address the interaction of lifestyle, biological, and the socio-environment to the risk of acquiring CVD among women (Oguma & Shinoda-Tagawa, 2004; Plotnikoff et al., 2000; 2001). Further research is also required to specifically address physical activity behaviour among employed women to prevent CVD. There have been few

research studies that address various demographic, psychosocial, and environmental factors to tailor physical activity workplace programs for this population.

2.5. Workplace physical activity and ecological frameworks

Workplace physical activity: current trends

The notion of promoting physical activity in a workplace setting to decrease illness and disease has been recognized as a pivotal and popular approach for several reasons: 1) easy access to employees, 2) established communication networks, 3) potential social support interactions, and 4), the potential to develop physical activity as an organizational norm (Cameron et al., 2002; Plotnikoff, Prodaniuk, Fein, & Milton, in press; Plotnikoff & Moodie, 2002; USDHHS, 1996).

The implementation of worksite health promotion initiatives have reported improvements in corporate image and recruitment, increased efficiency, productivity gains, decreases in absenteeism and turnover, lower medical costs and decreases in industrial injuries (Gamble, Boreham & Stevens, 1993; Health Canada, 2001; Shephard, 1996). Research in this area has demonstrated that by targeting employees' health risk behaviors through prevention programs, a return on investment (ROI) can range from $1.95-$3.95 per employee for every dollar spent (Cameron et al., 2002). Within 3-5 years these programs can reduce health care and absenteeism costs (Aldana, 2001; Serxner, Anderson, & Gold, 2004).

Worksite health promotion evaluations have shown some evidence of meeting Canadian and U.S. health objectives focused on increasing physical activity programming

in this setting (Canadian Fitness and Lifestyle Research Institute [CFLRI], 2004; Centre for Association Leadership, 2002). For example, physical activity workplace programs have reported higher participation rates than other non-workplace programs (Polanyi, Frank, Shannon, Sullivan & Lavis, 2000). Moreover, current reports indicate that approximately 90% of U.S. workplaces offer at least one type of health promotion program (Centre for Association Leadership). Within Canada, approximately 25% of employees have programs to improve health, physical fitness, or nutrition at work (Cameron et al., 2002). According to the CFLRI (2004), approximately 40% of employers in Canada have reported that they have sponsored or provided funds for a special physical activity event or for a local sports team.

Although these data are somewhat optimistic, an outstanding objective is to increase the proportion of employees, and employed women in particular, who participate in health promotion activities (Centre for Association Leadership, 2002). Overall, 20-30% of employees report participating in a workplace physical activity program and only half of these participate regularly (Dishman, Oldenburg, O'Neal, & Shephard, 1998). Among these employees, women are more likely than men to report never using the facilities and programs at work (Cameron et al., 2002). Furthermore, only two in five working Canadians with access to group discounts or subsidies offered by their workplace use local facilities such as fitness clubs. Merely one quarter of this population with access to on-site facilities participates in individualized or group fitness programs at work, where available (Cameron et al.).

The limited participation of employees in available workplace physical activity programs, particularly among women, is largely due to the increased focus on service

delivery in several workplace environments. Many employees report having less time for themselves, and as a result they have become more inactive (Cameron et al., 2002; Chapman, 2003; Health Canada, 2001). Women more than men, have reported a lack of time due to work demands as a barrier to being physically active (Cameron et al.). The consequences of extended work hours, and employers' desire to reduce operating costs have resulted in variable, irregular and unpredictable schedules, and lack of flexibility (Cameron et al.). Demands imposed by work schedules and conditions have impacted employed women to a greater degree than employed men since women are largely responsible for looking after their homes and families. For instance, in Canada, 60% of partnered women with a full-time job and children at home, spend 15 hours more per week performing unpaid household chores, compared with 26% of men in a similar position (Statistics Canada, 1996). Moreover, women overall demonstrate lower earnings than employed men (Statistics Canada, 1996, 2000; 2004), and when both unpaid and paid work are considered, women work significantly longer hours than men (e.g., 2 weeks more per year) (Statistics Canada, 2000). The current situation that employed women confront has thus had significant implications for their economic security and independence (Ministers' Report, 2001), which has limited their participation in physical activity.

Inactivity levels of employees have also increased healthcare and benefit costs (Health Canada, 2001). The current nature of the workplace environment has had implications for employers providing health benefit coverage, workers' compensation, disability coverage, and sick leave absenteeism for a large number of employees (Chapman, 2003; Serxner et al., 2004).

It is also noteworthy that most worksite reports and studies represent large white-collar organizations, and women more than men, are employed in atypical work (e.g., part-time or temporary work, self-employment, or work for more than one employer) (Statistics Canada, 2000; 2004). Further research is required in the areas of entrepreneurial and small worksites (e.g., less than 50 employees) to capture the trends of employee workplace physical activity programming participation, specifically for women (Plotnikoff et al., in press).

Ecological frameworks

The benefits of implementing health promotion programs in the workplace will continue to be limited without the integration of a broad and multi-level approach to changing physical activity and health in the workplace (Polanyi et al., 2000). For example, physical activity patterns may be influenced by the psychological, social, and physical work demands that usually stem from workplace decisions (Polanyi et al., 2000). Yet, these issues have not received adequate attention and require further investigation.

Recognizing that social and environmental contexts can influence the choices made by individuals has had implications for workplace health promotion. As a result of women responding better to recommendations based on PADL in comparison to LTPA, strategies to increase the energy expenditure of everyday activities through lifestyle changes have been recognized as a way to improve exercise and fitness in women who find it a challenge to take time out of their busy day (Krummel et. al., 2001). For effective change to occur specifically for women, workplace health promotion programs have been requested to shift focus from viewing health as the absence of disease or

illness, and recognize that physical activity as a lifestyle is influenced by "life chances" (e.g., choices made by individuals can be influenced by the socio-environment in which they live) (Frohlich & Potvin, 1999, p. S13).

Consequently, workplace health promotion in recent years has evolved from traditional interventions that target individual behaviour lifestyle change into a more integrative concept that includes socio-environmental, economic, and organizational influences on workers' health (Chu et al., 2000; Polanyi et al. 2000; Labonte, 1994). Since physical inactivity has been cited as a major contributing factor for many conditions affecting employees ability to work (Plotnikoff & Moodie, 2002) there have been recent attempts to develop these approaches for physical activity promotion (Gauvin, Levesque, & Richard, 2001; Sallis & Owen, 2002; Spence & Lee, 2003; Plotnikoff, Prodaniuk, Fein, & Milton, in press). The multi-level models and interventions developed are considered 'ecological approaches,' 'frameworks,' or 'models' to changing behaviour (Gauvin, et al., 2001; McLeroy, Bibeau, Stecler, & Glanz, 1988; Sallis & Owen, 2002). Ecological frameworks focus on the individual (e.g., knowledge, attitudes and behaviors), the multiple dimensions of the individual's environment (e.g., social, organizational, community, policy, physical environments), and the interaction between each of these levels (McLeroy et al.).

Movement in the health promotion field towards the use of ecological frameworks has been influenced by the Ottawa Charter for Health Promotion (World Health Organization, 1986) and the Achieving Health for all Framework (Epp, 1986). For instance, McLeroy and colleagues' (1988) ecological model comprises the principles regarding the interactions between multiple levels of health promotion interventions. The

levels include: 1) *intrapersonal factors* (e.g., knowledge, attitudes and skills), 2) *interpersonal processes* and *primary groups* (e.g., formal and informal social network and social support systems), 3) *institutional factors* (e.g., social institutions with organizational structures and formal or informal rules and regulations), 4) *community factors* (e.g., relationships between organizations, institutions, and informal networks within defined boundaries), and 5) *public policy* (e.g., municipal, provincial, federal, and international laws and policies). According to McLeroy and colleagues, interventions focusing within and between these levels will lead to changes in the health of individuals and populations. Sallis and Owen (2002), add the dimension of physical environments to this model for the physical activity domain.

There have been limited studies examining ecological approaches to promoting physical activity among women (Eyler et al., 2002a; 2002b; King et al., 2000), particularly ones that can be used as frameworks within workplace settings (Tessaro et al., 1998; 2000). However, workplace health promotion interventions targeting multi-level strategies (e.g., management support, social environment, organizational resources, marketing, and perceived barriers and facilitators) have revealed an increase in physical activity program participation levels, especially among minority and lower paid employees (Crump, Earp, Kozma, Hertz-Picciotto, 1996).

One ecological framework that shows promise for the promotion of physical activity among employed women includes a recently developed and validated program standard and a linked workplace physical activity audit tool (WPAAT) (Plotnikoff et al., in press). The WPAAT assesses a physical activity program based on a standard of best practices that can be used to plan, implement, and evaluate physical activity programs in

the workplace based on McLeroy et al., (1998) and Sallis & Owen's (2002) ecological frameworks. The structure of an occupational health and safety program (Alberta Human Resources and Employment, 2000) was also used to operationalize the model.

The three primary sections of the program standard include *preparation* ("groundwork"), *program components* ("construction"), and *procedures* ("detailing") that can be used by program planners to determine a baseline score for their workplace and prepare an action plan for shortcomings identified within the audit. The preparation phase includes the issues that should be addressed before initiating a physical activity program in the workplace: management and employee commitment, and needs and environment assessment. The *program components* section includes the inter-connected ecological components at the individual (e.g., knowledge, attitudes and skills), social (e.g., enhancing relationships), organizational (e.g., leadership, capacity, will, and infrastructure), community (e.g., assets and partnerships) and policy level (e.g., current physical activity policies and drafting new policies). The *procedures* section addresses program administration, and the safety and risk management issues that must be addressed to prevent and prepare for incidents associated with the physical activity program.

The audit tool is not prescriptive since each organization has unique characteristics, yet it provides decision-makers within the organization a framework in which appropriate and necessary improvements can be identified and addressed. The audit tool takes into consideration a variety of social and environmental factors that can be generalized to a variety of groups, and as such may serve as a useful framework for employed women.

More research, however, is warranted in workplace health promotion with respect to women and physical activity. In identifying pertinent physical activity program requirements for this population, it is also essential to determine what 'health' means to the organization, and the extent to which physical activity and women's needs and interests is a priority for that organization. Further, it is important to identify the 'nature' of the workplace, in terms of its bureaucratic and non-bureaucratic processes. It is also pertinent to understand whether the workplace is used as setting/structure for change (where conditions outside the individual control are ignored) or as an entity in which people are recognized to be acting within a greater social system (Fox, 1994).

2.6. Social Cognitive Theories

Introduction

To understand the individual level of ecological models, a group of key social-cognitive theories predicting physical activity behaviour change have been examined in the literature. The understanding of psychosocial cognitions on individual behaviour can help to motivate change and suggest directions for achieving improvements in health. Physical activity interventions based on theory have been found to provide a better understanding of behaviour than atheoretical interventions to increase participation (Dishman & Buckworth, 1996; Dishman et al., 1998). Current research has also demonstrated effective strategies to deliver these interventions when they are tailored to the participants' current needs and interests (Marcus & Forsyth, 1998; Marcus et al., 1998a; Petterson & Aldana, 1999; Serxner et al., 2004).

However, the extent of participation, effectiveness, and the quality of physical activity programs in the workplace, in part is limited due to the lack of demonstrated

long-term success through rigorous evaluation of theory-based interventions (Dishman et al., 1998; Marshall, 2004; USDHHS, 1996). To address gaps within workplace physical activity programs, several studies have examined the use of behavioural theory among physical activity interventions (Campbell et al., 2002; Dishman & Buckworth, 1996; Marcus et al., 1994; Peterson & Aldana, 1999; Tessaro et al., 1998; 2000). Althouth there is minimal theory-based research focused on the physical activity behaviours of women in the workplace (Marcus, Pinto, Simkin, Audrain, & Taylor, 1994), the following briefly overviews the key social-cognitive theories that provide guidance in this domain.

2.6.1. The Transtheoretical Model

The Transtheoretical Model (TTM) was developed by Prochaska and DiClemente (1983). The model uses stages of change to integrate processes and principles of change to enhance positive behaviour modification (Prochaska, Redding & Evers, 2002). This model can be tailored to the individual given that it addresses both the challenge of adopting regular physical activity among those who are inactive, as well as maintaining and providing relapse prevention among those who are engaging in regular physical activity (Marcus et al., 1998; Petterson & Aldana, 1999). The TTM recognizes that people differ in their readiness to adopt new behaviours and the inclination to change behaviours can be understood in terms of four key constructs: 1) stage of change, 2) decisional balance, 3) process of change, and 4), self-efficacy (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2003; Fahrenwald & Walker, 2003).

The stage of change construct includes five stages: 1) precontemplation (not intending to change behaviour within the next six months), 2) contemplation (intending

to change behaviour and take action within the next six months), 3) preparation (intending to take action within the next thirty days and has taken some behavioural steps in this direction), 4) action (has changed behaviour for less than six months), and 5), maintenance (has changed behaviour for more than six months) (Prochaska et al., 2002). The stages of change are considered both stable (e.g., an individual can stay at one stage for a period of time) and flexible (e.g., an individual can move between stages) (Prochaska et al.).

The cognitive constructs of decisional balance include pros (the benefits of changing), cons (the costs of changing) and processes of change (e.g., consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation, self-liberation, helping relationships, counterconditioning, reinforcement management, stimulus control, and social liberations). Pros and cons are considered the motivational mechanisms of behaviour change (e.g., cons of changing behaviour are usually higher for sedentary individuals when compared to those who are regularly active) (Prochaska et al., 2002). The processes of change encourage or facilitate behaviour change and are useful as guides for intervention programs (Prochaska et al.).

Self-efficacy is the confidence that one has to engage in a specific behaviour across different challenging situations. This construct is most likely considered the key factor in the action stage (Baranowski et al., 2003; Fahrenwald & Walker, 2003).

The TTM has been effective in explaining physical activity behaviour among employed women (Jaffee, Lutter, Rex, Hawkes, Bucaccio, 1999; Marcus et al., 1994; Purath, Miller, McCabe, & Wilbur, 2004). Previous studies have suggested that employed women with multiple roles and responsibilities, may be better served by stage-

matched interventions to increase physical activity. For example, Marcus and colleagues reported that full-time employed women who had children under age 18 were found to be at the lower stages of exercise adoption and reported significantly lower efficacy for exercise. This is also consistent with similar research conducted on low income mothers with children where the presence of young children in the home was cited as a barrier to participating in LTPA (Fahrenwald & Walker, 2003). These women also reported lower self-efficacy scores at the earlier stages of physical activity adoption.

Other findings have suggested that there are specific incentives and barriers that are unique among employed women (Jaffee et al.,1999; Marcus et al., 1994; Fahrenwald & Walker, 2003). For example, Jaffee and colleagues' study captured differences between employed women in different stages of change for physical activity. Women who were in the contemplation stage reported barriers more frequently than did women in any other stage. Along with those in the pre-contemplation stage, these women also reported lower self-efficacy ratings. Additionally, although their worksite offered the convenience of a fitness facility, lack of time was reported as a barrier to employed women in all stages, particularly for those with family commitments. Similar results have been replicated, specifically among mothers with young children who have been cited to perceive unique pros and cons to regular physical activity (Fahrenwald & Walker).

Although the TTM has generally received support for its application to physical activity behaviour (Marshall & Biddle, 2001), there have been inconsistent results, and a need to standardize its constructs has been recognized (Baranowski et al., 2003; Leslie, Johnson-Kozlw, Sallis, Owen, & Bauman, 2003; Marshall & Biddle; Plotnikoff, Hotz, Birkett, Courneya, 2001). For instance, meta-analysis results have concluded that existing

research data was not able to confirm whether physical activity behaviour change occurs in a series of stages that are meaningfully different from one another (Marshall & Biddle). Also, from the meta-analysis, higher order constructs of the processes of change were not found to be evident when testing for change in physical activity behaviour. The moderators and mediators of stage transition were highlighted as factors that need further investigation towards understanding behaviour change.

In many cases, a measure of stage has been used as proxy measure for level of exercise, specifically when there is limited space for self-report questions, or because a change in stage may be the intermediate outcome before change in behaviour occurs (Bull, Eyler, King, & Brownson, 2001). This measure has most often been used to reflect participation in regular vigorous physical activity, which would classify those who are in action and maintenance stages (Leslie et al., 2003). Important adjustments have been made to the stage measure however, to incorporate lifestyle or moderate intensity physical activity (Leslie et al.), particularly among diverse groups of women whose activity levels may be better reflected by this modified measure (Bull et al.). Yet, physical activities of moderate intensity may be more difficult to recall and to accurately measure (Leslie et al., 2003). Since the nature of moderate activities are less planned and structured, they may be considered as subsidiary to vigorous activities (Leslie et al.). Consequently, there has been a call for further research to standardize and improve this staging measure by defining and testing its reliability for different types of physical activities across varying population groups (Leslie et al.).

2.6.2. Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) was formed as an extension to the Theory of Reasoned Action, which was first introduced by Fishbein (1967) (e.g., behaviour is dependent upon the degree to which individuals encompass a large amount of internal control over performing this behaviour, where motivation, as measured by intentions, and attitude and subjective norm are expected to be the main determinants of behaviour). Recognizing that behaviour may be explained by factors outside of an individual's control, the TPB established behavioural performance as being determined by both motivation (intentions) and ability (behavioral control) (Ajzen, 1991). The theory proposes that it is a person's intentions in performing a behaviour that is central to this act. Intentions is determined by the principle beliefs that establish one's attitude, subjective norm, and perceived behavioural control (Ajzen). For example, individuals who have a positive attitude and greater perceived subjective norm toward a behaviour than others, will most likely exhibit high intentions to perform this behaviour (Baranowski et al., 2003).

Attitude, subjective norm, and perceived behavioural control are considered independent determinants of behavioural intentions (Ajzen, 2000). The degree to which these three constructs determine intentions will vary for different behaviours and populations (Montano & Kasprzyk, 2002). For instance, an individual's attitude is determined by the strength of his/her beliefs about what will happen as a result of doing a specific behaviour (Baranowski et al., 2003). Subjective norm consists of injunctive norm (e.g., the individual's beliefs about whether specific people want them to do, or not to do the behaviour), and descriptive norm (e.g., the individual's beliefs about whether their

social network performs a behaviour (Ajzen, 2000). Perceived behaviour control is the interaction between the perceived control (e.g., the external or internal factors that facilitate or inhibit performing a behaviour) and the perceived power (e.g., the strengths of each factor in making behavioural performance difficult or easy) (Ajzen, 2000).

Perceived behavioural control moderates the relationship of the intentions to perform the behaviour (Baranowski et al., 2003). When perceived behaviour control is high, intentions will most likely be converted to behaviour (Baranowski et al.). When attitude and subjective norm are held constant, a person's perception of their control and power over performing a behaviour will affect their behavioural intentions (Montano & Kasprzyk, 2002).

Self-efficacy is a distinct component of perceived behavioural control, and has been successful in predicting intentions (Rhodes & Courneya, 2003; Terry & O'Leary, 1995). Research evidence suggests that measures of self-efficacy and perceived behavioural control should be operated separately since these two variables can be empirically distinguished from one another (Terry & O'Leary).

Overall, the TPB has been identified as a parsimonious model to explain the determinants of self-reported exercise behaviour (Blue, 1995; Courneya, Plotnikoff, Hotz & Birkett, 2001; Rhodes, Jones, & Courneya, 2002), and in understanding the decision-making process underlying this behaviour (Ajzen & Fishbein, 1980; Baranowski et al., 2003; Godin, 1994). Specifically, the theory provides a basis for understanding the factors that help to initiate physical activity behaviour, planning individual programs (Blue, 1995) and promoting exercise programs to a target group in the population (Dishman, 1994). For example, research results focusing on exercise behaviour among

adults have shown that exercise programs offering a positive experience will potentially enhance the intentions to exercise, which in turn may influence the behaviour (Blue, 1995).

To date, the TPB has not been tested on employed women with respect to physical activity behaviour. However, research results testing other behaviours such as the intentions to have a mammography among older women (Godin et al., 2001), and the prediction of condom use among black, hispanic, and white women (Montano & Kasprzyk, 2002), have determined salient factors for the development of intervention messages. Other studies focusing specifically on exercise, found significant predictors of exercise among older women such as perceived control beliefs, normative beliefs, and behavioural beliefs (Conn, 2001; Conn, Tripp-Reimer, & Mass, 2003). Overall, these findings based on statistical multiple regression techniques and qualitative interviews, provided support for the application of TPB to exercise in older women.

The TPB has also been useful for discerning stages of change with respect to physical activity (Courneya, 1995; Courneya et al., 2001; Troped & Saunders, 1998). Various psychosocial constructs have predicted different stage transitions (Courneya et al.) as well as gender differences (Troped & Saunders). Among a population-based sample of 683 adults, intentions and attitude predicted transitions at all stages of change, perceived behavioural control predicted transition from the contemplation stage, and subjective norm predicted transition from the pre-contemplation stage (Courneya et al.).

Stages of change have also been useful for detecting gender differences. In a sample of 644 adults, gender differences have been demonstrated with normative beliefs and motivation to comply (Troped & Saunders, 1998). Normative beliefs are an indirect

measure of subjective norm and are described as one's beliefs about whether others approve or disapprove of the behaviour and having the motivation to comply to do what others think (Troped & Saunders). In Troped and Saunders study, gender differences were greatest at the earlier stages of exercise adoption. The results suggest the use of intervention strategies specific for men and women in the pre-contemplation and contemplation stage. For example, involving significant others and developing "exercise buddies" may be more effective with less active women than men. However, both men and women may have greater motivation to comply when expectations from spouses and children exist.

While the TPB constructs can account for over 40% of the variance in explained intentions and over 30% of the variance in physical activity behaviours (Godin & Kok, 1996), there has been a call for further experimental studies (Blue, 1995; Conner & Armitage, 1998; Courneya et al., 2001; Rhodes et al., 2002). Modifications and extensions to the TPB have been considered as a way of furthering the understanding of the relationships between the theory's constructs (Baranowski et al., 2003; Conner & Armitage; Rhodes et al.). For example, social support has been found to possess greater validity when compared to subjective norm for predicting exercise intentions and behaviour, and as such, has been supported as a distinct concept to the theory (Rhodes et al.). Considering that exercise behaviour is not always under the individual's (internal) control (e.g., when it is not only sufficient for a person to know whether significant others approve of the behaviour) it is more likely that assistance from others for performing the behaviour may be more helpful for performing the behaviour (Rhodes et al.).

2.6.3. Protection Motivation Theory

As an alternative theory to predicting intentions and behaviour, Rogers' (1983), PMT describes threat and coping appraisal as the mediation process of behaviour change. There are four cognitive processes that serve as mediators on an individual's perception affecting their motivation to be protected from disease or illness. The theory's threat appraisal depends on: 1) the perceived severity of the threat (e.g., the perceived seriousness of the threat), and 2), the perceived vulnerability to the threat (e.g., the perceived risk of obtaining the threat). The emotional state of fear has been found to influence attitudes and behaviour change indirectly through the appraisal of the severity of the threat (Rogers). The theory's coping appraisal depends on: 1) response efficacy (e.g., the individual's expectancy that carrying out recommendations can remove the threat), and 2), self-efficacy (e.g., the belief in the individual's capability to take action on the threat successfully) (Rogers). The theory assumes a positive linear relationship with these four mediators (Rogers). Achieving healthy behaviour change depends on both the individual's threat appraisal, and the coping response being effective in avoiding the threat and having the ability to carry out the coping response. Accordingly, it is the significant associations of the theory's mediators to intentions that is recognized as the major predictor of behaviour change (Rogers).

PMT has had partial success in predicting intentions and health behaviour change, particularly in exercise behaviour (Plotnikoff & Higginbotham, 1995; 1998; 2002; Wurtele & Maddux, 1987). In one recent study, the theory's coping appraisal produced stronger positive significant associations when compared to the threat components in motivating community adults to initiate and maintain exercise behaviour for the

prevention of CVD (Plotnikoff & Higginbotham, 2002). Specifically, self-efficacy and response efficacy were found to be more important in the adoption of healthy behaviour change than the perception of severity or vulnerability of heart disease. Overall, the results indicate that positive coping messages are a beneficial strategy to enhancing healthy behaviour change for the prevention of CVD among community adults (Plotnikoff & Higginbotham, 2002).

In a similar study conducted with cardiac patients, age and sex was found to be associated with following recommended diet and exercise behaviours (Plotnikoff & Higginbotham, 1998). In this study, younger patients indicated greater severity and fear of their cardiac condition than older patients, and women demonstrated lower levels of exercise self-efficacy and self-reported exercise than in men. Overall results among these studies indicate that age and sex should be taken into consideration when planning heart health interventions.

PMT has not been tested on employed women regarding its applicability to forecasting physical activity intentions and behaviour, however, minimal research has been conducted on the theory's predictability of other health behaviours with this population. Helmes (2002) tested PMT to investigate the influences of women's motivation to obtain genetic testing for breast cancer risk. In this study, women (n= 330), recruited with physicians' help, were inclined to pursue getting tested when the perceived risk and the disadvantages of not getting tested was high. Those who perceived more advantages of not getting tested showed less motivation as measured by their intentions to obtain genetic testing. Emotions such as breast cancer worries also had a direct influence on intentions. The results recognized the influences of both the perceived

vulnerability and severity of breast cancer on fear, that in turn influenced women's intentions to getting tested for the risk of incurring breast cancer.

While there is some evidence promoting the use of PMT, more research is required to test the theory's constructs. The threat appraisal of the theory requires further attention, considering that it has not shown strong mediation effects on exercise behaviour (Plotnikoff & Higginbotham, 1995; 1998; 2002). Additionally, feeling fear has shown inconsistent results with PMT (Helmes, 2002; Plotnikoff & Higginbotham, 1995; 1998; 2002). Although fear has been associated with severity, it has also been related to vulnerability and response efficacy. As demonstrated in previous study results, fear may have a direct relationship to intentions (Helmes, 2002) in addition to acting as a mediator for severity and vulnerability (Plotnikoff & Higginbotham, 1995). The inclusion of fear in further studies would benefit the debate within the health promotion literature of operationalizing fear tactics/messages to promote recommended health behaviours (Plotnikoff & Higginbotham, 1995). Contrary to fear, self-efficacy has proved itself as the strongest socio-cognitive predictor of exercise outcomes, specifically among male and female cardiac patients (Plotnikoff & Higginbotham, 1998). However, self-efficacy has not demonstrated significance among women in breast cancer risk testing (Helmes, 2002). Such inconsistency among PMT constructs across different population groups provides strong grounds for further research. Specifically, the examination of demographic contexts (e.g., employed women) would benefit the knowledge base of the theory's applicability in the exercise domain.

2.6.4. Social Cognitive Theory

In 1986, Bandura introduced a comprehensive framework for understanding human social behaviour based on his Social Learning Theory where behaviour, person, and the environment influence behaviour change (Bandura, 1986). The Social Learning Theory was renamed as the SCT to better explain human behaviour as dynamic, and reciprocal in which behaviour, personal factors, (e.g., cognitive, affective, biological events), and environmental factors all interact (Baranowski, Perry, & Parcel, 2002). The constructs and processes in SCT are suggestive of a variety of potential avenues for program design (Baranowski et al.). The constructs that comprise this theory include: environment, situation, behavioral capability, expectations, expectancies, self-control, observational learning, reinforcements, self-efficacy, emotional coping responses, and reciprocal determinism (as the overarching concept to this theory).

The following briefly describes each of the theory's constructs based on Baranowski et al. (2002): 1) Factors that are physically external to an individual (e.g., social support from family members, friends, peers at work or at school) are considered part of the *environment* construct. 2) *Situation* refers to the individual's perception of the environment (e.g., place, time, physical features, activity, participants, the individual's own role in the situation. 3) The knowledge and skill to perform a given behaviour describes an individual's *behavioural capability.* 4) *Expectations* describes the anticipated outcomes of a behaviour. 5) *Expectancies* depicts the values that an individual places on a particular outcome. 6) The personal regulation of directing behaviour based on goals refers to the construct of *self-control.* 7) *Observational learning* assumes that behaviour performance occurs by watching the actions and outcomes of others'

behaviours. 8) The increased or decreased likelihood of repeating a particular behaviour based on the feedback given to the individual (e.g., rewards and incentives) describes the *reinforcements* construct. 9) *Self-efficacy* is the individual's confidence in performing a particular behaviour and overcoming the barriers to that behaviour. Self-efficacy is described as the most important prerequisite for changing behaviour because it affects how much effort is invested and to what level of performance is attained. 10) *Emotional coping responses* describes the strategies used by an individual to deal with emotional factors. 11) The interaction between the individual, behaviour, and the environment in which the behaviour is performed outlines *reciprocal determinism.* The principle of reciprocal determinism emphasizes the importance of recognizing changes in both the environment and the individual for explaining behaviour change.

The SCT has shown promising evidence in predicting physical activity behaviour among individuals with diabetes (Allen, 2004). From a critical review of the diabetes literature, Allen (2004) concluded that self-efficacy provided the strongest support for using SCT to predict exercise behaviour among adults. However, mixed findings were found for the predictability of outcome expectancies for exercise behaviour. The generalizability of the findings are limited due to the small number of studies examined (n=13). Further, most studies investigated participants' self-efficacy with respect to their exercise behaviours as part of a self-care regimen and not as part of one's leisure time. It is interesting to note, the studies were predominately based on adult female samples.

Support has also been provided for the SCT's utility in improving physical activity behaviour among community groups of mothers and daughters (Ransdell, Dratt, Kennedy, O'Neill, & DeVoe, 2001). Ransdell et al. (2001) study demonstrated that after

a 12-week physical activity intervention grounded in SCT, mother and teenage daughter pairs significantly improved their perceived sport competence, physical condition, strength, muscularity, physical self-perception, and mother-daughter bonding. Physiological (e.g., height, weight, VO_2) and self-report measures (e.g., physical self-perception profile subscale scores) as well as focus group interviews were conducted. All of the theory's constructs were operationalized. Although the study had a small sample size (n=20), the SCT provided a useful framework for planning the intervention, and for facilitating improvements achieved by both mothers and daughters.

Although the research is limited, SCT has been successfully applied to promote healthy behaviour change among employed women. One intervention that has significantly contributed in this area includes Health Works for Women (HWW) (Campbell et al., 2002; Tessaro et al., 1998; 2000). The 18-month worksite intervention aimed at improving several health behaviours including physical activity among rural women employed in blue-collar worksites. The intervention utilized women volunteers as "natural helpers" (n= 104) within nine small to mid-sized organizations to diffuse health promoting information and provide support for behaviour change among female co-workers. The design of the intervention was based on focus group results conducted with these women.

The HWW intervention operationalized the SCT through social networks established with the assistance of the natural helpers. At the intra-personal level, computer generated individually tailored health messages were designed to inform women about health risks in the areas of smoking, diet, physical activity, and breast and cervical screening utilizing the SCT and other theories such as the TTM. Approximately

538 women completed baseline, and follow-up surveys based on the health messages grounded in the SCT and TTM.

The HWW intervention demonstrated that employed women can be recruited and trained to diffuse health promotion information and provide support to co-workers for health behaviour change using the SCT and other supporting models such as the TTM. For example, group activities at the worksite, particularly with physical activity, increased over-time during the intervention. The natural helpers also expanded the diffusion of health promotion information from a close network of members (e.g., immediate families) to co-workers, friends, and community members. The importance of recognizing the influences of the environment in addition to psychosocial variables (e.g., behaviour-specific barriers, outcome expectations, stage of change, social support, informational needs, and community resources) that are unique to employed women was also emphasized.

Although the SCT has proven its relevance in designing health promotion interventions and programs, it has also been considered too comprehensive because of the dynamic interplay of its many constructs (Baranowski et al., 2002). There is limited research on studies that have examined the theory in its entirety. Ransdell and colleagues' (2001) study is one exception to the papers reviewed in this section. Based on the review of the literature of SCT and physical activity behaviour change interventions, most often, only a portion of the constructs are analyzed, particularly, the environment, expectancies, self-control, and self-efficacy.

In comparison to other behavioural theories, the SCT has become a popular theory to employ, specifically among practitioners. It is important that both practitioners

and researchers carefully examine the situations in which the theory applies, and limit their assertions to those that are supported by empirical evidence (Baranowski et al., 2002). Due to the minimal research examining the theory's utility among employed women and their physical activity behaviours, it would be worthwhile to investigate further the theory's constructs. Supplementary research would help to determine the constructs that are most significantly relevant among this population for program interventions.

2.7. Conclusion

This review of the literature set out to provide directions towards the characteristics required for successful physical activity programs for working-women within the workplace and physical activity domains. The review specifically focused on 1) intra-personal and environmental factors influencing women's physical activity behaviours including multiple role status, 2) the influence of multiple roles on employed women's wellbeing, particularly the issues surrounding CVD/diabetes, 3) workplace physical activity and ecological frameworks and, 4) social-cognitive theories related to physical activity.

In spite of the well-known benefits of physical activity to health, the examination of the literature confirmed a gap of knowledge concerning employed women and workplace physical activity programs. Employed women are particularly under-researched and this poses as a concern since a larger proportion of women are at greater risk for CVD and diabetes than men, and are currently physically inactive to achieve beneficial effects for disease prevention and overall health. Furthermore, many

workplace physical activity programs are focused on recreational sports and exercise (Verhoef & Love, 1994), and tend to exclusively have an individual behaviour lifestyle change approach (Chu et al., 2000). Yet, there are important differences that are unique to employed women who may experience unique stressors due to their multiple responsibilities and social roles across their life span (e.g., working women with children) that are often not recognized and can have implications for the planning of physical activity programs at the workplace (Verhoef & Love). The social environment in which women conduct their daily routines of work and personal life can influence their physical activity behaviour and it is important to examine this further across different demographic groups.

Employees, employers, practitioners, and researchers can benefit from a gender-focused study on physical activity behaviours. The research data from this study will contribute and advance the knowledge involving women in these domains to help build and/or improve workplace programs and policies. A successful program may contribute in the long-term to help decrease illness and disease, particularly cardiovascular disease and diabetes among employed women.

2.8. Thesis Aim

The aim of this thesis is to provide directions towards developing effective physical activity programs for working-women. The research conducted in two studies will determine major components that will need to be considered for program development which are specifically tailored to physical activity behaviour and life stage while also being socio-culturally sensitive to gender, and the environment. Employed

women's demographics, psychosocial factors, and physical activity behaviours, in addition to the environment across various factors (e.g., physical, social, organization, community, policy) will be analyzed within workplace settings. Employed women who are 1) *with* children, and 2) *without* children, will be the groups of individuals under study.

2.9. Study Questions

Study 1:

1. Which social-cognitive theories and constructs from the TTM, TPB, PMT, and SCT are most salient for explaining physical activity intentions and behaviour among employed women i) *with* children and ii) *without* children?

Study 2:

1. a) Are employed women's multiple roles and responsibilities associated with physical activity behaviour?

If so,

b) How is this association similar or dissimilar between employed women i) with children and ii) without children?

2. What environmental characteristics (e.g., physical, social, organizational, community, policy) are salient to accommodate workplace physical activity programs for women?

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Chapter 3- Manuscript #1

Predicting Social-cognitive Theories for Explaining Physical Activity Behaviours Among Employed Women *with* and *without* Children

Abstract

Background: Effects of chronic disease interventions in women have been understudied in the workplace domain. Understanding the role of cognitions in individual behaviour can help to motivate change and suggest directions for achieving improvements in health, yet, there is minimal theory-based research in this domain examining women's physical activity (PA) behaviours. The purpose of this study was to determine which psychosocial constructs and social-cognitive theories [e.g., Transtheoretcal model (TTM), Theory of Planned Behavior (TPB), Protection Motivation Theory (PMT), and Social Cognitive Theory (SCT)] are most salient for explaining physical activity behaviour among employed women.

Methods: Employed women (n= 1183) were selected based on a convenience sample of 5 large worksites in Alberta. Participants were assessed on their 1) demographic information, and 2) validated social-cognitive measures related to PA, 3) PA intentions and, 4) PA behaviours (e.g., stage of change, energy expenditure) over 3 time points (baseline, 3 months, and 6 months). A series of multiple regression analyses with PA behaviour as the dependent variable were conducted separately for: 1) women with children (n=302), and 2) women without children (n=881) for each of the respective social-cognitive theories. The TTM and PMT were examined longitudinally, while the TPB and SCT were assessed cross-sectionally.

Results: Self-efficacy and intentions were the strongest predictors of behaviour among women with and without children. Variance explained in PA behaviour for the two groups of women ranged from 16% to 24% for TTM, 23% to 47% for PMT, 34% to 57% for TPB, and 27% to 36% for SCT.

Conclusion: Research on employed women is still in its infancy. Integrating approaches of individual lifestyle change while addressing issues related to creating supportive environments for women in various life stages is a suggested strategy for future work in this area.

Key Words: chronic disease interventions; employed women; life stages; social-cognitive theories; physical activity

Introduction

Although the benefits of physical activity to prevent disease are well known, a larger proportion of women are at greater risk for cardiovascular disease (CVD) and diabetes than men, and are inadequately inactive for disease prevention and overall health (Heart and Stroke Foundation, 2003; Statistics Canada, 2001). Throughout the lifespan, more women than men are physically inactive with 59% of women not engaging in regular leisure-time physical activity as compared with 52% of men (Canadian Fitness and Lifestyle Research Institute [CFLRI], 2002). As an independent risk factor for CVD, high rates of physical inactivity among women have raised concern for the need of interventions, and program implementation to promote increases in activity levels (Krummel et al., 2001).

In an attempt to encourage physical activity, the workplace has been recognized as an important channel for the promotion of physical activity among adults (Plotnikoff, Prodaniuk, Fein, Milton, in press; United States Department of Health and Human Services [USDHHS], 1996). Worksites offer the potential to reach a large percentage of the population with established communication and support networks, as well as the opportunity to develop corporate norms of behaviours and overall well-being (Plotnikoff & Moodie, 2002).

Employed work plays an important role in many women's lives. More women now than ever before are participating in paid work in addition to their family and household duties (Gjerdingen, McGovern, Bekker, Lundberg, Willemsen, 2000). Yet, although more women are in the workforce, they still partake in the majority of family and household duties in comparison to men (Clark, 2001; Gjerdingen et al.; Women's

Health Surveillance Report, 2003). In addition, employed women, particularly those who engage in multiple roles (partner, parent, paid employee) are exposed to stressors (e.g., increased physical and mental ailments, menstrual disorders, CVD, musculoskeletal impediments, depression, and anxiety) that may have implications for their physical activity behaviours and overall well being (Barnes, Pase & VanLeeuwen, 1999; Gjerdingen et al., 2000). Many of these employed women undergo more life-changing events that can impact their health than men or non-employed women (Barnes et al.; Gjerdingen et al.). For example, more often than men, women do a considerable amount of work (approximately 5-10 hours more per week) that is diffusely distributed between their job, household, and childcare responsibilities, especially mothers caring for young children (Gjerdingen et al.). Additionally, 38% of married mothers employed full-time report that they experience serious levels of stress because of time demands, compared to 20% of women without children (Statistics Canada, 2000). On the contrary, parental status has been reported to have little effect on the stress levels among men (Statistics Canada).

Unfortunately, women as a group have been under-researched (Marcus, Pinto, Simkin, Audrain & Taylor, 1994; Plotnikoff, Hugo, Wielgosz, Wilson, MacQuarrie, 2000), and the effects of CVD (Krummel et al., 2001), and diabetes preventive interventions in women (Brandenburg et al., 2003), have been inappropriately understudied in the workplace domain. Although women have been included in several socio-cognitive and behavioural health promotion studies, gender differences have not been systematically examined, particularly in response to intervention strategies (Marcus, Dubbert, King, Pinto, 1995). Most of the current knowledge in this area is primarily

based on existing studies examining associations between physical activity and chronic disease among Caucasian males (Women's Health Surveillance Report, 2003). Further, most study reports in the physical activity domain are generally based on leisure-time physical activity (LTPA) performed during spare time, with activities performed at work or in the home not being captured through current surveillance systems and other pertinent research studies (Women's Health Surveillance report). As a result, our understanding of women and physical activity has not advanced at the pace needed to meet the public health recommendations put forward by the Surgeon General (National Centre for Chronic Disease Prevention, 1999) and other health authorities (Women's Health Surveillance Report).

Consequently, there remains a gap of knowledge concerning employed women and workplace physical activity programs. In part, the extent of participation, effectiveness, and the quality of physical activity programs in the workplace is limited due to important social roles unique to women (e.g., women with and without children) that are not often recognized (Marcus et al., 1994; Miller, Stewart, Trost, & Brown, 2002; Verhoef & Love, 1992; 1994). This is noteworthy since women's social roles are associated with physical activity behaviour (Eyler et al., 2002a; 2002b; Gjerdingen et al., 2000; Marcus & Forsyth, 1998; Marcus et al., 1994; Miller et al.; Pinto, Marcus, & Clark, 1996; Scharff, Homan, Kreuter, & Brennan, 1999; Sternfeld, Ainsworth, & Quesenberry, 1999; Verhoef & Love, 1992; 1994; Women's Health Surveillance Report, 2003). Studies exploring non-traditional forms of physical activity or physical activities of daily living (PADL) (such as occupational activity, and household chores) in combination with LTPA, suggest both physical activity classifications as an alternative method of activity

promotion that may be best suited for women with multiple roles and responsibilities such as those who are employed with young children (Miller et al.; Salmon, Owen, Bauman, Schmitz, & Booth, 2000; Women's Health Surveillance Report, 2003). However, it remains unclear how the workplace environment and related activities may play a part in influencing overall physical activity behaviour for women in combination with their other social roles and responsibilities (e.g., employee, partner, parent). Specifically, the mechanisms underlying physical activity behaviours for employed women *with* and *without* children requires further attention.

Social-cognitive theories

To address gaps within workplace physical activity programs, several studies have examined the use of behavioural theory among physical activity interventions (Dishman & Buckworth, 1996; Dishman, Oldenburg, O'Neal, & Shephard, 1998; Marcus et al., 1994; Peterson & Aldana, 1999). Theory-based physical activity interventions have been found to provide a better understanding of behaviour than atheoretical interventions (Dishman & Buckworth, 1996). These interventions have helped to motivate change and provide directions for achieving improvements in health. The current research has demonstrated that strategies used to deliver these interventions can be most effective when they are tailored to the participants' current needs and interests (Marcus & Forsyth, 1998; Marcus et al., 1998a; Petterson & Aldana; Serxner, Anderson, & Gold, 2004).

While there is minimal theory-based research investigating women, and specifically employed women, within the physical activity literature (Marcus et al., 1994), there are several key social-cognitive theories that have been examined among

adults to predict physical activity behaviour change. The Transtheoretical Model (TTM), Protection Motivation Theory (PMT), Theory of Planned Behaviour (TPB), and Social Cognitive Theory (SCT), have all provided an understanding of the psychosocial cognitions motivating physical activity behaviours. The following briefly overviews these social-cognitive theories:

The Transtheoretical Model (TTM)

The TTM was developed by Prochaska and DiClemente (1983). The model uses stages of change to integrate processes and principles of change to enhance positive behaviour modification (Prochaska, Redding & Evers, 2002). This model can be tailored to the individual given that it addresses both the challenge of adopting regular physical activity among those who are inactive, as well as maintaining and providing relapse prevention among those who are engaging in regular physical activity (Marcus et al., 1998a; Petterson & Aldana, 1999). The TTM recognizes that people differ in their readiness to adopt new behaviours and the inclination to change behaviours can be understood in terms of four key constructs: 1) stage of change, 2) process of change, 3) decisional balance, and 4) self-efficacy (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2003; Fahrenwald & Walker, 2003).

The stage of change construct includes five stages: 1) precontemplation (not intending to change behaviour within the next six months), 2) contemplation (intending to change behaviour and take action within the next six months), 3) preparation (intending to take action within the next thirty days and has taken some behavioural steps in this direction), 4) action (has changed behaviour for less than six months), and 5)

maintenance (has changed behaviour for more than six months) (Prochaska et al., 2002). The stages of change are considered both stable (e.g. an individual can stay at one stage for a period of time) and flexible (e.g. an individual can move between stages) (Prochaska et al.). In many cases, a measure of stage has been used as a proxy measure for level of exercise, specifically when there is limited space for self-report questions, or because a change in stage may be the intermediate outcome before change in behaviour occurs (Bull, Eyler, King, & Brownson, 2001).

The cognitive constructs of decisional balance include pros (the benefits of changing), cons (the costs of changing) and processes of change (e.g. consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation, self-liberation, helping relationships, counterconditioning, reinforcement management, stimulus control, and social liberations). Pros and cons are considered the motivational mechanisms of behaviour change (e.g., cons of changing behaviour are usually higher for sedentary individuals when compared to those who are regularly active) (Prochaska et al., 2002). The processes of change encourage or facilitate behaviour change and are useful as guides for intervention programs (Prochaska et al., 2002).

Self-efficacy is the confidence that one has in engaging in behaviour across different challenging situations. This construct is considered the key factor in the action stage (Baranowski, 2003; Fahrenwald & Walker, 2003).

Theory of Planned Behaviour (TPB)

The TPB was formed as an extension to the Theory of Reasoned Action (TRA), which was first introduced by Fishbein (1967). [TRA specifies that behaviour is

dependent upon the degree to which individuals encompass a large amount of internal control over performing this behaviour, where motivation (as measured by intentions), attitude, and subjective norm are expected to be the main determinants of behaviour]. Recognizing that behaviour may be explained by factors outside of an individual's control, the TPB identifies motivation (intentions) and ability (behavioral control) as the main factors to determine behavioural performance (Ajzen, 1991). The theory proposes that it is a person's intentions in performing a behaviour that is central to this act. Intentions is determined by the principle beliefs that establish one's attitude, subjective norm and perceived behavioural control (Ajzen, 1991). For example, individuals who have a positive attitude and a greater perceived subjective norm toward a behaviour than others will most likely exhibit a high intentions to perform this behaviour (Baranowski et al., 2003).

Attitude, subjective norm, and perceived behavioural control are considered independent determinants of behavioural intentions (Ajzen, 2000). The degree to which these three constructs determine intentions will vary for different behaviours and populations (Montano & Kasprzyk, 2002). For instance, an individual's attitude is determined by the strength of his/her beliefs about what will happen as a result of doing a specific behaviour (Baranowski et al., 2003). Subjective norm consists of injunctive norm (e.g., the individual's beliefs about whether specific people want them to do, or not do the behaviour), and descriptive norm (e.g., the individual's beliefs about whether their social network performs a behaviour) (Ajzen, 2000). Perceived behaviour control is the interaction between the perceived control (e.g., the external or internal factors that

facilitate or inhibit performing a behaviour) and the perceived power (e.g., the strengths of each factor in making behavioural performance difficult or easy) (Ajzen, 2000).

Further, self-efficacy has shown to be a distinct component of perceived behavioural control, and has been successful in predicting intentions (Rhodes & Courneya, 2003; Terry & 0'Leary, 1995). Research evidence suggests that measures of self-efficacy and perceived behavioural control should be operated separately since these two variables can be empirically distinguished from one another (Terry & O'Leary).

The TPB has been identified as a parsimonious model to explain the determinants of self-reported exercise behaviour (Blue, 1995; Courneya, Plotnikoff, Hotz & Birkett, 2001; Rhodes, Jones, & Courneya, 2002), and in understanding the decision-making process underlying this behaviour (Ajzen & Fishbein, 1980; Baranowski et al., 2003; Godin, 1994). Specifically, the theory provides a basis for understanding the factors that help to initiate physical activity behaviour, planning individual programs (Blue, 1995) and promoting exercise programs to a target group in the population (Dishman, 1994). For example, research results focusing on the TPB and exercise behaviour among adults have shown that exercise programs offering a positive experience will potentially enhance the intentions to exercise, which in turn may influence the behaviour (Blue, 1995).

Although the theory has provided insight into behaviour change, several modifications and extensions to the TPB have been considered as a way of furthering the understanding of the relationships between the theory's constructs (Baranowski et al., 2003; Conner & Armitage, 1998; Rhodes et al., 2002). For example, social support has been found to possess greater validity when compared to subjective norm for predicting

exercise intentions and behaviour, and as such, has been supported as a distinct concept to the theory (Rhodes et al.). Considering that exercise behaviour is not always under the individual's (internal) control (e.g., when it is not only sufficient for a person to know whether significant others approve of the behaviour) it is more likely that assistance from others for performing the behaviour may be more helpful in engaging in the behaviour (Rhodes et al.).

Protection Motivation Theory (PMT)

As an alternative theory of predicting intentions and behaviour, Rogers' (1983), PMT describes threat and coping appraisal as the mediation process of behaviour change. Overall, there are four cognitive processes that serve as mediators on an individual's perception affecting their motivation to be protected from disease or illness. The theory's threat appraisal depends on: 1) the perceived severity of the threat (e.g., the perceived seriousness of the threat), and 2) the perceived vulnerability to the threat (e.g., the perceived risk of obtaining the threat). The emotional state of fear theoretically influences attitudes and behaviour change indirectly through the appraisal of the severity of the threat (Rogers). The theory's coping appraisal depends on: 1) response efficacy (e.g., the individual's expectancy that carrying out recommendations can remove the threat), and 2) self-efficacy (e.g., the belief in the individual's capability to take action on the threat successfully (Rogers). The theory assumes a positive linear relationship with these four mediators (Rogers).

PMT has had partial success in predicting intentions and health behaviour change, particularly in predicting exercise behaviour (Courneya, 1995; Plotnikoff &

Higginbotham, 1995; 1998; 2002; Wurtele & Maddux, 1987). The success in healthy behaviour change depends on both the individual's threat appraisal, and the coping response being effective in avoiding the threat and having the ability to carry out the coping response. It is the significant associations of the theory's mediators to intentions that recognizes intentions as the major predictor of behaviour change (Rogers, 1983).

Social Cognitive Theory (SCT)

Bandura (1986), introduced a comprehensive framework for understanding human social behaviour based on his Social Learning Theory (e.g., behaviour, person, and the environment influence behaviour change). The Social Learning Theory was renamed as the SCT to better explain human behaviour as dynamic, and reciprocal in which behaviour, personal factors, (cognitive, affective, and biological events) and environmental factors all interact (Baranowski, Perry, & Parcel, 2002). The constructs and processes in SCT are suggestive of a variety of potential avenues for program design (Baranowski et al.). The constructs that comprise this theory include: environment, situation, behavioral capability, expectations, expectancies, self-control, observational learning, reinforcements, self-efficacy, emotional coping responses, and reciprocal determinism (as the overarching concept to this theory).

Although the SCT has proven its relevance in designing health promotion interventions and programs, it has also been considered too comprehensive because of the dynamic interplay of its many constructs (Baranowski et al., 2002). Based on our review of the literature, there is limited research where the theory has been examined in its entirety in the physical activity domain. Most often, only a portion of the constructs are

analyzed, particularly, self-efficacy, self-control, expectancies, and the environment. Self-efficacy is the individual's confidence in performing a particular behaviour and overcoming the barriers to that behaviour (Baranowski et al.). This construct is described as the most important prerequisite for changing behaviour because it affects how much effort is invested and to what level of performance is attained (Baranowski et al.). The personal regulation of directing behaviour based on goals refers to the construct of self-control and expectancies depicts the values that an individual places on a particular outcome. Factors that are physically external to an individual are considered part of the environment construct in which one's physical surroundings, including their social support networks, are a part of (e.g., family members, friends, peers at work or at school) (Baranowski et al.).

Study purpose

Currently, there is limited research applying behavioural theories to physical activity among employed women that acknowledges their demographic differences. The purpose of this study was to determine which social-cognitive theories and constructs from the TTM, PMT, TPB, and SCT are most salient for explaining physical activity intentions and behaviour among employed women i) *with* children and ii) *without* children.

Methods

Background and Design

This study is part of a larger research project designed to evaluate the efficacy of a 12-week electronic messaging intervention for diet and physical activity behaviours (Plotnikoff, McCargar, Wilson & Loucaides, in press). Web-based, self-report questionnaires were administered immediately before and after a 12-week intervention with a 6-month follow-up to large worksites in Alberta. Male and female staff (n= 2599) between the ages of 35-55 with access to internet and a personal e-mail address participated in the study. The participants were randomly assigned to either a control group (n=651) or an intervention group (n= 1948). The intervention group received weekly messages to their e-mail address, and the control group received messages at the end of the intervention period. Results indicated that the intervention had moderate efficacy in increasing and/or maintaining recommended physical activity and nutrition behaviours. Further, the intervention group demonstrated significantly higher scores than the control group on attitudes towards physical activity and nutrition behaviours. The study was approved by the Human Research Ethics Review Board of the Faculty of Physical Education and Recreation at the University of Alberta.

The present study examines the demographic characteristics of women in the larger research project, and their psychosocial and behavioural aspects with respect to physical activity across three time points (e.g., baseline, 12 weeks, and a 6 month follow-up).

Sample

The participants were selected based on a convenience sample of 5 Alberta work-sites (3 government and 2 private sector organizations). Only women who completed all three time periods were selected for this study. The two groups examined were 1) women with children under 13 years of age (n=302), and 2), women without children under 13 years of age (n=881).

Participants provided their age, education (varying from some grade school to completed graduate school), marital status (varying from never married to widowed), and current employment status (full time, part-time). The parenthood status of participants was indicated by answering: "are you responsible for the care of children under 13 years old who live with you?" and if yes, "how many?" Participants indicated their current smoking status by choosing "yes" or "no." "Yes" and "no" scales were also used to determine further health status information with respect to cancer, diabetes, high blood cholesterol, and high blood pressure. See Table 3-1 for the demographic characteristics of the sample.

[Insert Table 3-1 About Here]

Measures

1) Social-cognitive theories and related constructs:

i) TTM constructs: Pros and cons (11 items) (Plotnikoff, Blanchard, Hotz & Rhodes, 2001) were assessed on 5-point Likert-type scales ranging from 1 (not at all) to 5 (very much). These scales indicated the extent to which the described ideas would influence their decision to do regular physical activity (e.g., Pro: would help me reduce tension or manage stress; Con: would cause me injury). Self-efficacy (8 items) (Plotnikoff et al.,

2001) was assessed using a 5- point Likert-type scale, ranging from 1 (not at all confident) to 5 (extremely confident), to measure the perceived confidence of doing regular physical activity under different circumstances, (e.g., when tired, when in a bad mood).

ii) PMT constructs: Severity, vulnerability, fear and response efficacy were adapted from Plotnikoff & Higginbotham (1998; 2002) and were each assessed with one item on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items were as follows: 1) Severity: "For me, being physically inactive would be a very bad thing"; 2) Vulnerability: "If I am inactive, I would be at risk for serious health problems"; 3) Fear: "For me, being physically inactive would frighten me because of the possibility of developing serious health problems"; 4) Response efficacy: "Regular physical activity is important for disease prevention (e.g., heart disease, diabetes)." Self-efficacy (Plotnikoff et al., 2001) was assessed using the scale as depicted above in TTM's description of constructs. Intentions (1 item) (Courneya et al., 2001) was assessed on a scale from 0% to 100% to determine how likely it is that the participant will get regular physical activity within the next 6 months.

iii) TPB constructs: Social support (1 item) (Courneya et al., 2001) was assessed on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) to measure support for participating in physical activity from those closest to the participant. Injunctive norm (2 items) (Courneya et al., 2001) was measured on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items were as follows:

"Most people in my social network want me to do regular physical activity"; "My doctor or health care provider wants me to participate in regular physical activity." Attitude (3 items) (Courneya et al., 2001), was assessed on a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much), to indicate if physical activity would be demanding, gratifying, boring over the next 6 months. Self-efficacy (Plotnikoff et al., 2001) was assessed as a proxy to perceived behavioural control construct using the scale as indicated above in TTM's description of constructs. Intentions (Courneya et al., 2001), was assessed using the scale as depicted above in PMT's description of constructs.

iv) SCT constructs: The physical environment (Sallis et al., 1992) was measured on a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree) to assess the participant's degree of access to a place where they can be physically active. Social support (Courneya et al., 2001) was assessed using the scale as described in the TPB's constructs above. Self-efficacy (Plotnikoff et al., 2001) was assessed using the scale as depicted in TTM constructs above.

Cronbach's alpha coefficients for the socio-cognitive scales are reported in the notes section of the results tables (i.e., Time 1 and 2 alphas are reported in Table 3-3; Time 3 alphas are reported in Table 3-4).

2) Physical Activity Measures:

Participants were instructed to answer all questions based on Health Canada's (1998) definition of moderate regular physical activity "that must add up to a total of 30 minutes or more per day and be done at least 4 days per week." Physical activity was assessed using the following two measures:

(a) A stage of change question asked participants to assess the frequency of their regular physical activity behaviour based on the above definition of moderate and regular activity by including physical activities of daily living (PADL) such as leisure-time, household chores, and work-time. This definition included USDHHS' (1996) recent recommendations to accommodate for non-traditional forms of activity. Stage of change (Reed, Velicer, Prochaska, Rossi & Marcus, 1997; Plotnikoff, Hotz, Birkett & Courneya, 2001) was assessed based on the participants' indication of their physical activity stage coded as 1 (precontemplation) through 5 (maintenance).

(b) Physical activity energy expenditure was measured by assessing the participant's strenuous and moderate physical activity levels that does not include household chores or physical labour performed on the job using the Godin Leisure Time Questionnaire (Godin & Shephard, 1985). Participants were asked to indicate their physical activity patterns in "times per week" and "average time per session" in minutes. Energy expenditure was calculated using the metabolic equivalent (MET) scores based on Pate and colleagues' (1995) classification of energy expenditure (e.g., moderate activity =3-6 METs; and vigorous = >6 METs). METs were calculated based on Brown & Bauman (2000) using the following formula: MET.minutes = (Weekly minutes of moderate activity x 4 METs)

+ (Weekly minutes of Vigorous activity x 7.5 METs). To determine the participants' general physical activity status from their reported energy expenditure, the participants were categorized as active or inactive. All active participants were classified as receiving $\geq$ 600 METs (this reflects 30 minutes of moderate activity [4 METs] on five days each week) (Brown & Bauman) (Table 3-1).

Main Analysis

A series of multiple regression models were conducted for each of the behaviour measures as the dependent variable and the theory constructs as the independent variables. Longitudinal analyses (i.e., T1-T2: Time 1 cognitive constructs predicting intentions and energy expenditure [EE] at Time 2, and T2-3: Time 2 cognitive constructs predicting intentions, EE, and stage at Time 3) examining the TTM and PMT were conducted. To investigate the TPB and SCT, cross-sectional analyses (e.g., T3-3: Time 3 cognitive constructs predicting intentions, EE, and stage at Time 3) were conducted, as information for the PADL staging measure and constructs from the TPB and SCT were only available at time 3. Regression analyses were statistically adjusted for group (e.g., control and intervention) and carried out separately for (1) women *with* children and, (2) women *without* children (Table 3-2).

[Table 3-2 About Here]

Results

The following results are based on multiple regression tests conducted on the sub-groups of women with children and women without children for each of the TTM, PMT, TPB, and SCT (Tables 3-3 and 3-4).

[Tables 3-3 and 3-4 About Here]

TTM (Longitudinal analysis)

Women with children

The variance explained (R^2) for EE was 24% at T1-2, and 16% for T2-3. R^2 for stage of change at T2-3 was 18%. Self-efficacy was significant ($p<0.001$) for predicting EE at T1-2, T2-3, T3-3, and at T2-3 for stage. Also at T2-3, pros were significant ($p<0.05$) for EE, and cons were significant ($p<0.001$) for predicting stage.

Women without children

Similar to women with children, R^2 for predicting EE at T1-2 was 24%, and 23% at T2-3. R^2 for predicting stage was also 23% at T2-3. Self-efficacy was significant ($p<0.001$) across all three time points for predicting EE ($p<0.001$), and at T2-3 for stage ($p<0.001$). Unlike women with children, the pros construct was significant at Time 1-2 ($p<0.01$) for EE and for stage at T2-3 ($p<0.01$). Cons were also significant for predicting stage ($p<0.05$) at T2-3.

PMT (Longitudinal analysis)

Women with children

R^2 predicting intentions was 45% at T1-2, and 25% at T2-3. R^2 predicting EE at T1-2 was 29% and 23% at T2-3. Stage explained 26% of the variance at T2-3. Self-efficacy was significant for EE at T1-2 ($p<0.001$), and for predicting intentions across all three time periods ($p<0.001$). Intentions were also significant for EE across all three time periods ($p<0.001$), and for stage at T2-3 ($p<0.001$). Fear was found significant for stage at T2-3 ($p<0.01$).

Women without children

Similar to women with children, R^2 predicting intentions was 47% at T1-2, and 37% at T2-3. Energy expenditure accounted for 27% of the variance at T1-2, and 24% at T2-3. R^2 predicting stage was 28%. Self-efficacy was significant for intentions and EE across all three time periods ($p<0.001$), and for predicting stage at T2-3 ($p<0.001$). Intentions were also significant across all three time periods for predicting EE and for stage at T2-3 ($p<0.001$). Unlike women with children, response efficacy and vulnerability were significant at T1-2 for predicting intentions ($p<0.01$). Fear was also significant for predicting stage at T2-3 ($p<0.05$).

TPB (Cross-sectional analysis)

Women with children

The R^2 for predicting intentions and behaviour was: 1) 51% for intentions, 2) 50% for stage and 3), 40% for EE. Self-efficacy was significant for intentions and EE

($p<0.001$). Intentions were significant for predicting stage and EE ($p<0.001$). Social support ($p<0.001$) and attitude ($p<0.05$) were significant for predicting intentions.

Women without children

The R^2 predicting intentions and behaviour was: 1) 57% for intentions, 2) 45% for stage and 3), 34% for EE. Resembling women with children, self-efficacy was significant for intentions and EE ($p<0.001$). Also, intentions were significant for predicting stage and EE ($p<0.001$). Social support and attitude were significant for predicting intentions ($p<0.001$; $p<0.01$), stage ($p<0.001$; $p<0.01$), and EE ($p<0.05$) for the three respective time points.

SCT (cross-sectional analysis)

Women with children

The R^2 predicting behaviour was 27% for stage, and 36% for EE. Self-efficacy was significant for predicting stage and EE ($p<0.001$). Social support was found to be significant for stage ($p<0.05$).

Women without children

Stage and EE respectively explained 29% and 31% of the R^2. Similar to women with children, self-efficacy was significant for predicting stage and EE ($p<0.001$). Social support also was significant for stage ($p<0.001$) and EE ($p<0.05$).

A summary of the significant constructs found for each theory/model according to the intentions and behaviour outcomes for each subgroup are listed in Table 3-5.

[Table 3-5 About Here]

Discussion

This study set out to determine which social-cognitive theories/models and constructs from the TTM, PMT, TPB, and SCT are the most salient for explaining physical activity intentions and behaviour among employed women with children and without children. Due to the minimal research with employed women and their multiple roles and physical activity behaviours, examining various social-cognitive theories/constructs advance the knowledge towards implementing successful program interventions.

A series of multiple regression tests were conducted separately for women with children and women without children for each of the TTM, PMT, TPB, and SCT. Two sets of longitudinal analysis (Time 1-2 and Time 2-3) examined the TTM and PMT. The TPB and SCT were assessed by cross-sectional analysis (Time 3-3). Each of these analyses were examined with (1) intentions, (2) stage of behaviour change measure, and (3) EE; as three separate dependent outcome measures.

Variance of Theories between Outcome Measures

The variance explained (R^2) across the outcome measures for each theory were as follows: (1) the TTM ranged from 16% to 24% for women with children and from 23% to 24% for women without children. (2) R^2 for PMT ranged from 23% to 45% for women

with children, and 24% to 47% for women without children. (3) TPB ranged from 40% to 51% for women with children and 34% to 57% for women without children. (4) R^2 for SCT ranged from 27% to 36% for women with children and 29% to 31% for women without children. Overall, R^2 was similar between both sub-groups of women (a 1% to 12% difference) with TPB representing the largest difference in variance, and PMT indicating the least amount of difference in variance across the outcome measures for all three time periods. These ranges generally reflect what has been reported in other studies within the physical activity domain where the variance explained generally falls within the 30-38% range (Baranowski, Anderson, Carmack, 1998; Rhodes, Plotnikoff, Spence, 2004).

Intentions as a penultimate behaviour outcome, largely explained the majority of the variance when compared with stage and energy expenditure across the theories at all time points. The largest difference in variance between intention and the behaviour outcomes was indicated within the TPB among women without children (23%). Stage and energy expenditure demonstrated comparable results to one another with a 2% to 11% difference at T2-3 among sub-groups. For example, the TPB illustrated the largest difference (11%) among women without children between stage and energy expenditure, and TTM indicated a 2% difference among women with children at T2-3. For the most part, the variance explained was higher for the stage of change outcome measure when compared to energy expenditure.

The differences in variances explained between the longitudinal and cross-sectional designs in this study may be largely due to the specific outcome measure analyzed, and/or specific constructs within each theory, rather than the actual empirical

design. Although longitudinal research designs are most commonly employed when evaluating social-cognitive theories when predicting physical activity behaviour (Dishman, 1994; King, Stokols, Talen, Brassington, & Killingsworth, 2002), a recent study has provided strong evidence that cross-sectional designs are an effective alternate methodology to examine social-cognitive theories in the exercise domain (Rhodes & Plotnikoff, in press).

The greater variance reported among the stage of change outcomes when compared to energy expenditure suggests that behaviour change among employed women may be better explained through stage. Participants were asked to consider their PADL for the stage of change measure compared with energy expenditure that measured LTPA. As mentioned earlier, PADL may be a better measure of women's physical activity behaviours, and has received empirical support for its applicability in explaining differences in this domain (Fahrenwald & Walker, 2003; Jaffee, Lutter, Rex, Hawkes & Bucaccio, 1999; Marcus et al., 1994). A further discussion of PADL is presented below along with a description of each social-cognitive theory. Additionally, self-efficacy and intentions were the strongest predictors of behaviour (e.g. energy expenditure, stage) among the theory constructs for women both with and without children across all theories and time points. This is consistent with other studies where these two constructs have received the most support as determinants of physical activity (Dishman, 1994; Marcus et al., 1994; Plotnikoff et al., 2001). It is noteworthy that differences may also be specific to whether women are living with or without children. (This will be further discussed in the theory specific sections below).

Transtheoretical Model (TTM)

The TTM has been effective in understanding exercise behaviour among employed women (Jaffee et al., 1999; Marcus et al., 1994; Purath, Miller, McCabe, & Wilbur, 2004). Studies that have examined the utility of the TTM suggest that employed women with multiple roles and responsibilities, may be better served by stage-matched interventions to increase physical activity. In this study, pros, cons, and self-efficacy were significant for both women with and without children when predicting stage of change. However, the cons construct was not significantly associated with the energy expenditure outcome measure for women with and without children. This suggests that stage of change may have better captured unique differences between groups of women as an outcome measure than energy expenditure in this study. For example, previous studies utilizing the stage of change measure have indicated that women, and specifically mothers with young children, perceive unique pros and cons that can influence their physical activity behaviour (Fahrenwald & Walker, 2003; Jaffee et al., 1999; Marcus et al., 1994). In these studies, women who perceive that physical activity would make them feel healthier and better have demonstrated a positive association towards greater readiness to be active (Marcus et al., 1994). However, women who perceive high cons for activity (such as a lack of motivation or time due to work and home life commitments) have been reported to be in the lower stages of activity (e.g., contemplation, preparation) (Jaffee et al., 1999; Marcus et al., 1994).

In this study, women with children demonstrated a stronger association to cons (M= 2.05) (e.g., perceiving less time for family and friends if participating in physical activity; feeling too tired to engage in physical activity because of other daily

responsibilities) than women without children (M= 1.95) for stage of change. Yet, only women without children demonstrated an association of pros (e.g., perceiving that physical activity would reduce tension or stress; feeling more confident about health by getting regular physical activity) to predicting stage of change. These results are consistent with other findings that have suggested there are specific incentives and barriers unique to the workplace and employed women (Jaffee et al.,1999; Marcus et al., 1994; Fahrenwald & Walker, 2003). For example, the results in Jaffee and colleagues' study (1999) revealed that although their worksite offered the convenience of a fitness facility, lack of time was reported as a barrier for employed women, particularly those with family commitments, when predicting stage of change across all levels. Similar to other findings, employed mothers with children usually perceive greater barriers to physical activity participation than those without children, such as lack of support and time due to childcare responsibilities (Verhoef & Love, 1994).

Although, the significant relationships of pros and cons varied among the groups of women in this study, a significant positive association of self-efficacy remained for women with and without children. This is consistent with other research where women express confidence to engage in physical activity even when tired or in a bad mood (Marcus et al., 1994).

Protection Motivation Theory (PMT)

To date, PMT has not been tested on employed women regarding its applicability to predict physical activity intentions and behaviour. However, limited research has been conducted on the theory's predictability of other health behaviours among women. One

study has tested PMT to investigate the influences of women's motivation to obtain genetic testing for breast cancer risk (Helmes, 2002). Results demonstrated that women were inclined to pursue genetic testing when both the perceived risk and disadvantages of not obtaining the test was high. Those who saw higher advantages in not obtaining the test showed less motivation. PMT was helpful in determining the factors involved in women's intentions to obtain genetic testing, however, after the full model was tested, modifications were made that provided a better fit to support the data. For example, conclusions were made that emotions such as fear of breast cancer worries have a direct influence on intentions.

In our study, the fear of developing serious health problems from being physically inactive predicted stage of change among women with and without children. Similarly, in previous studies, women have reported concerns such as fear of injury, fatigue, or of past/current ailments (e.g., arthritis, heart problems) as barriers that hinder their participation in physical activity (Eyler, Baker, Cromer, King, Brownson, & Donatelle, 1998; Verhoef & Love, 1994). Also, it is interesting to note that a slightly stronger association ($p<0.01$) of fear to predicting stage (versus energy expenditure) among women with children ($M= 3.57$) was found compared to women without children ($M= 3.48$; $p<0.05$). Since women with children tend to perceive greater barriers (that includes fear) to physical activity than women without children (Verhoef & Love, 1994), differences between the groups of women may have been better captured through the stage of change outcome measure than energy expenditure. In fact, stage of change as a physical activity behaviour outcome measure for PMT has received support in past research (Courneya, 1995; Plotnikoff & Higginbotham, 1998; 2002).

Although there is evidence promoting the use of PMT, more research is required to test the theory's constructs, particularly with respect to women's physical activity behaviour. The threat appraisal of the theory requires further attention, considering it has not shown strong mediation effects to exercise behaviour in the studies previously mentioned. In these studies, the theory's coping appraisal has produced stronger positive significant associations when compared to the threat components, specifically in motivating community adults to initiate and maintain exercise behaviour for the prevention of cardiac heart disease (Plotnikoff & Higginbotham, 2002). Additionally, although significant in this study, feeling fear has shown inconsistent results with PMT in past research (Helmes, 2002; Plotnikoff & Higginbotham, 1995; 1998; 2002).

While fear has been associated with severity in previous studies, it has also been associated with vulnerability and response efficacy. For instance, previous study results have indicated that fear may have a direct relationship to intentions (Helmes, 2002) in addition to acting as a mediator for severity and vulnerability (Plotnikoff & Higginbotham, 1995). In our study, response efficacy and vulnerability were significant among women without children when testing for intentions as a behaviour outcome measure. The analysis of fear in further studies would benefit the debate within the health promotion literature regarding the appropriate use of messages that target fear as an effect for adopting recommended behaviours particularly among employed women.

Self-efficacy has proven to be the strongest predictor of exercise outcomes in this study, and in a previous study among male and female cardiac patients (Plotnikoff & Higginbotham, 1998). However, self-efficacy has not demonstrated significance among women for breast cancer risk testing (Helmes, 2002). The inconsistency among PMT

constructs across different population groups provides strong grounds for further research. Close attention to demographic contexts (e.g., employed women) would strengthen our understanding of the theory's applicability, specifically in the exercise domain.

Theory of Planned Behaviour (TPB)

To date, the TPB has not been tested on employed women with respect to physical activity behaviour. However, research results testing other behaviours such as intentions to have a mammography among older women (Godin et al., 2001), and the prediction of condom use among black, hispanic, and white women (Montano & Kasprzyk, 2002), have determined which factors are most relevant for the development of intervention messages. Other studies focusing specifically on exercise, found that significant predictors of exercise among older women were perceived control beliefs, normative beliefs, and behavioural beliefs (Conn, 2001; Conn, Tripp-Reimer, & Mass, 2003). Overall, findings from such studies based on statistical multiple regression techniques and qualitative interviews, provide support for the application of TPB to exercise in women.

The TPB has also been useful for discerning stages of change with respect to physical activity (Courneya, 1995; Courneya et al., 2001; Troped & Saunders, 1998). Different constructs have shown to predict different stage transitions (Courneya et al.). Among a population-based sample of 683 adults, intentions and attitude predicted transitions at all stages of change, perceived behavioural control predicted transition from

the contemplation stage, and subjective norm predicted transition from the pre-contemplation stage (Courneya et al.).

In our study, intentions reported a significant association to predicting stage for women with and without children, when compared to attitude. Attitude predicted stage only for women without children, yet attitude predicted intentions as an outcome measure for both groups of women. Given that intentions are the penultimate outcome of actual behaviour, the stronger association of attitude to intentions as an outcome measure among women without children may explain the significant associations found for stage and energy expenditure.

While the TPB can account for 41% of the variance in intentions and 34% of the variance in a variety of predicted behaviours (Godin & Kok, 1996), there has been a call for further experimental studies to examine additional variables to the theory (Blue, 1995; Conner & Armitage, 1998; Courneya et al., 2001; Rhodes et al., 2002). These studies have helped to provide a greater understanding towards the processes of current TPB variables. Social support is one variable examined that has demonstrated empirical evidence to support its addition to the TPB (Conner & Armitage, Courneya et al.; Rhodes et al.). In our study, social support was significant for all behaviour outcomes among both groups of women when testing for intentions and among women without children in predicting stage of change and energy expenditure.

Social support has proven relevant in understanding intentions and behaviour within the exercise domain when compared to subjective norm (e.g., a person's beliefs about whether significant others think they should engage in a behaviour) (Rhodes et al., 2002). Subjective norm has most often contributed small or non-significant predictions to

intentions and behaviour (Rhodes et al.). This may be due to participation in physical activity not always occurring at will (Rhodes et al.). It is likely that social support may be needed most from others to perform the behaviour, rather than knowing that others approve of that behaviour. This rationale supports the non-significant prediction of injunctive norm (as a component of subjective norm) to the behaviour outcome measures in this study.

Social support has been recognized in previous studies as an important influencing factor for women achieving physical activity (Eyler et al., 1998; 2002a; 2002; Miller et al., 2002; Verhoef & Love, 1994). Many women will cite having partner, co-worker, friend or family member, and childcare support (for those with children) as important for adopting behaviour change. Further, women with children have perceived a greater lack of social support when compared to women without children in past research (Verhoef & Love, 1994). Although our study did not find social support as a significant predictor of stage or energy expenditure among women with children, a comparison of the scale means shows that women without children (M= 3.14) perceive greater social support from those closest to them than women with children (M= 3.05).

Social Cognitive Theory (SCT)

There is limited research testing SCT among employed women and their physical activity. Yet, those studies that have applied SCT among employed women in physical activity interventions have shown evidence of success (Campbell et al., 2002; Tessaro et al., 1998; 2000). Other studies within the physical activity domain have also provided evidence of support for applying SCT, particularly among individuals with diabetes

(Allen, 2004), and community groups of mothers and daughters (Ransdell, Dratt, Kennedy, O'Neill, & DeVoe, 2001).

Tessaro and colleagues' studies (1998; 2000), and Campbell and colleagues' study (2002) on the effects of a Health Works for Women (HWW) intervention provides strong support for utilizing SCT among employed women. The 18-month worksite intervention aimed at improving several health behaviours including physical activity among rural women employed in blue-collar worksites. The intervention utilized women volunteers as "natural helpers" (n= 104) within nine small to mid-sized organizations to diffuse health promoting information and provide support for behaviour change among female co-workers. Constructs from the SCT along with the stage of change measure from the TTM (as a supporting behaviour change strategy) were operationalized. Group activities at the worksite, particularly with physical activity, increased over-time during the intervention. The HWW intervention demonstrated the influences of the environment (e.g., social support, community resources) in addition to psychosocial variables (e.g., behaviour-specific barriers, outcome expectations, stage of change, informational needs) that are unique to employed women when attempting to institute positive behaviour change.

In other studies, self-efficacy has provided one of the strongest supports for using SCT to predict physical activity behaviour, particularly among women. For example, a critical review by Allen (2004), concluded that self-efficacy predicted exercise behaviour among individuals with diabetes. However, most of the studies reviewed were based predominately on adult female samples. Further, Ransdell et al. (2001) study demonstrated that after a 12-week physical activity intervention grounded in SCT, mother

and teenage daughter pairs significantly improved their perceived sport competence, and physical self-perception along with their physical condition, strength, muscularity, and mother-daughter bonding.

Similar to the findings in the above study, our results demonstrated that both social support and self-efficacy were significant in predicting stage and energy expenditure among women with and without children for SCT. Although, self-efficacy was a consistently stronger predictor of the behaviour outcomes ($p<0.001$), social support demonstrated significant results, among both groups of women. These results were expected as they are comparable to those found within the TPB. The physical environment construct however, was not found to be a significant predictor of behaviour. Since both items in the questionnaire were listed in conjunction to one another, the participants may have perceived social support to be more relevant than the physical environment. Further, although there is some research evidence to show that the physical environment may be a correlate of physical activity behaviour among women, this aspect of the environment has received less empirical attention than other environmental factors (Eyler et al., 2002a; 2002b). Additional research in this area has been suggested for future work (Eyler et al., 2002a; 2002b).

Because the SCT in comparison to other behavioural theories has become a popular theory to employ, by practitioners, it is important that both practitioners and researchers carefully examine the situations in which the theory applies, and limit their assertions to those that are supported by empirical evidence (Baranowski et al., 2002). Due to the minimal research examining the theory's utility among employed women and their physical activity behaviours, it would be worthwhile to further investigate the

constructs that have provided the most significant relevance among this population. The assessment of the SCT in its entirety would also be useful to determine the applicability and practicality of operating the framework, and the relevance of other under-utilized constructs.

Limitations and future research considerations

In interpreting the results, there are limitations that should also be taken in to consideration. First, this study relies on self-report data. Potential biases in self-report data (e.g., over-reporting physical activity behaviour) may not be representative of the population under study (Dishman, 1994). More objective measures would have strengthened the results.

Further, although there is evidence to suggest that cross-sectional designs are as effective as longitudinal designs in examining the predictive ability of social cognitive theories within the exercise domain (Rhodes & Plotnikoff, in press) two of the theories were examined cross-sectionally. Additional understanding between theory-driven physical activity interventions and programs will be advanced through the empirical comparison of theories within the same design.

Also, the TTM and the SCT were not examined in their entirety. In many cases, only a few constructs are examined from the SCT specifically when there is limited space for self-report questions. Similarly, a measure of stage from the TTM has been used as proxy measure for level of physical activity to accommodate for space on questionnaires, and/or a change in stage can be viewed as the intermediate outcome before an actual change in behaviour occurs (Bull et al., 2001). In light of this, there has been a request for

further research to standardize and improve the stage of change measure by defining and testing its reliability for different types of physical activity across varying population groups (Leslie, Johnson-Kozlow, Sallis, Owen, & Bauman, 2003). However, there have been important suggestions made to adjust the measure to incorporate lifestyle or moderate intensity physical activity (Leslie et al.), particularly among a diverse sample of women whose activity may be better represented with this adjusted measure (Bull et al.). Yet, physical activities of moderate intensity may be more difficult to recall and to accurately measure (Leslie et al.). Both groups of women in this study may have over-reported their stage of physical activity.

Additionally, the lack of research among employed women in the physical activity and workplace area limits the comparability of this study's results to previous works. Most research has been conducted on correlates of physical activity among women and very few studies have empirically examined theories with this population specifically among employed women and their demographic differences. The characteristics of the target group however, will help to determine the most appropriate theoretical model to employ. For example, interventions that target women who are ready to start a physical activity program are not going to reach large segments of the population. In this case, theoretical models that recognize multiple levels of motivational readiness such as the TTM, may be most effective (Marcus, King, Clark, Pinto, & Bock, 1996).

Finally, while the use of theoretical models has proven to be of benefit to increasing physical activity, most studies explain a relatively small percentage of the variance in physical activity levels (King et al., 2002). One major challenge to applying

social-cognitive theories and their related constructs includes the observation that such theories do not fully integrate the social and environmental context for explaining physical activity behaviour. Further, seasonal differences between time points in the longitudinal analysis (3-6 month intervals) of this study may be due to varying weather patterns (e.g., snow and cold temperatures tend to decrease individuals' physical activities).

Implications for practice

The large proportion of women's physical inactivity levels remains a significant public health concern. There has been an increased awareness in recent years of the need to apply conceptual approaches to promote physical activity as a health-enhancing behaviour. The workplace in particular, has been recognized as pertinent setting for improving activity levels since the majority of the population spends a considerable amount of their day at work. Unfortunately, research on employed women is still in its infancy.

Overall, results from this study and from previous work within the physical activity domain, provide evidence to suggest that researchers and practitioners should consider operationalizing self-efficacy and intentions when working with employed women with and without children for future interventions and programs. Providing social support while eliminating barriers and promoting the benefits of being physically active should also be taken in to consideration, particularly among women with children. However, considering that social roles (e.g., employee, parent) are multifaceted, the extent of social-cognitive theories/constructs in explaining physical activity behaviour is

limited. Aspects of the physical environment in influencing women's readiness for behaviour change is an area that has received less attention and should be considered for future research investigations. Application of the stage of change as a behaviour outcome may also provide a useful strategy to capturing differences among women and their readiness to adopt behaviour change.

Although the theories in this study show promise in understanding the processes underlying physical activity behaviour, it does not conclude that a single theory proposes as a better fit among women with and without children. The results do however, offer a preliminary understanding towards which theory/constructs, may in part or in combination with other theories, be proposed as most suitable among these sub-groups of women. Integrating approaches of individual lifestyle change while addressing issues related to creating supportive environments for women in various life stages is a suggested strategy for future work in this area.

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Table 3-1: Demographic characteristics of sample*

Variable	Women with children (N=302)	Women without children (N=881)	
	Mean (SD)	**Mean (SD)**	**t-value (p)**
Age	41 (4.34)	46 (5.91)	-15.34 (p<0.001)
BMI	27 (5.64)	27 (6.21)	-1.46 (0.15)
EE**	587 (688.24)	647 (704.36)	-1.27 (0.21)
	n (%)	**n (%)**	**χ^2-value (p)**
Amount of children			NA
One child	151 (51)	NA	
More than one child	145 (49)	NA	
Employment			48.20 (p<0.001)
Full-time	261 (87)	853 (97)	
Part-time	40 (13)	23 (3)	
Education			0.11 (0.74)
Completed university or College	122 (40)	367 (42)	
Did not complete university or College	180 (60)	513 (58)	
Marital Status			32.46 (p<0.001)
Partnered	250 (83)	574 (65)	
Not Partnered	51 (17)	304 (35)	
Ethnic Origin			0.00 (1.00)
Canadian	256 (85)	744 (85)	
Non-Canadian	46 (15)	132 (15)	
Smoking Status			0.22 (0.64)
Smoker	35(12)	110 (13)	
Non-smoker	263 (88)	735 (87)	
Health Status (have had the following):			
Angina	2 (0.7)	4 (0.5)	-
Cancer	11(6)	55 (10)	3.34 (0.07)
Diabetes	14 (5)	32 (4)	0.14 (0.71)
Heart attack	2 (0.7)	7 (0.8)	-
Heart disease	104 (35)	314 (36)	0.06 (0.81)
High blood cholesterol	44 (16)	166 (21)	3.16 (0.08)
High blood Pressure	40 (14)	167 (21)	5.99 (p<0.05)
Stroke	3 (1)	11(2)	-

*Time 3 values are reported with the exception of age, BMI, and EE (baseline values)

**EE values are based on the definition of moderate regular physical activity that must add up to a total of 30 minutes or more per day and be done at least 4 days per week. Participants were also categorized as active ($\geq$ 600 METs) and inactive (< 600 METs): 54% of women with children (n=116) were active versus 58% of women without children (n= 369); 46% of women with children (n=98) were inactive versus 42% of women without children (n=266).

- Could not be computed

Table 3-2: Summary of multiple regression analyses

Theories/Models	*Intentions*	*PADL (stage of change measure)*	*Godin physical activity measure*
TTM	T1-T2* T2-T3	T3	T1-T2 T2-T3
PMT	T1-T2 T2-T3	T3	T1-T2 T2-T3
TPB	T3	T3	T3-T3
SCT	T3	T3	T3-T3

*T= time

Table 3-3: Multiple Regression Analysis Results for Women *with* and *without* Children (T1-2 and T2-3)

Theory	Construct	Time and Behaviour									
		Time 1 constructs predicting Time 2 behaviour				Time 2 constructs predicting Time 3 behaviour					
		Intentions *(βeta)*		Energy Expenditure *(βeta)*		Intentions *(βeta)*		Stage *(βeta)*		Energy Expenditure *(βeta)*	
		With children	*Without* children	*With* children	*Without* children	*With* children	*Without* children	*With* children	*Without* children	*With* children	*Without* children
TTM	Pros			NS	0.08**			NS	0.09**	0.12*	NS
	Cons			NS	NS			-0.21***	-0.08*	NS	NS
	Self-efficacy			0.48***	0.46***			0.28***	0.40***	0.32***	0.44***
				R^2=0.24, n= 301	R^2=0.24, n= 872			R^2=0.18, n= 298	R^2=0.23, n= 871	R^2=0.16, n= 301	R^2=0.23, n= 879
PMT	Severity	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Vulnerability	NS	0.07**	NS	NS	NS	NS	NS	NS	NS	NS
	Fear	NS	NS	NS	NS	NS	NS	0.14**	0.08*	NS	NS
	Response Efficacy	NS	0.09**	NS	NS	NS	NS	NS	NS	NS	NS
	Self-efficacy	0.65***	0.66***	0.29***	0.31***	0.50***	0.61***	NS	0.21***	NS	0.34***
	Intentions	NA	NA	0.29***	0.25***	NA	NA	0.49***	0.34***	0.48***	0.18***
		R^2=0.45, n= 302	R^2=0.47, n= 880	R^2=0.29, n= 301	R^2=0.27, n= 872	R^2=0.25, n= 302	R^2= 0.37, n= 878	R^2= 0.26, n= 298	R^2=0.28, n= 871	R^2=0.23, n= 301	R^2=0.24, n= 879

*p< 0.05; ** p< 0.01; *** p< 0.001
NS= not significant
NA= not applicable
Adjusted for treatment and control groups
Women with children: (self-efficacy: T1 α=.92; T2 α=.93/ pros: T1 α=.77; T2 α=.81/ cons: T1 α=.72; T2 α=.74)
Women without children: (self-efficacy: T1 α= .93; T2 α=.94/ pros: T1 α=.80; T2 α=.80/ cons: T1 α=.74; T2 α=.72)
Missing information on all variables ranged from 0% - 7% for women with children and 0% - 10% for women without children.

Table 3-4: Multiple Regression Analysis Results for Women *with* and *without* children (T3-3)

Theory	Construct	Time and Behaviour					
		Time 3 constructs predicting Time 3 behaviour					
		Intentions *(βeta)*		Stage *(βeta)*		Energy Expenditure *(βeta)*	
		With Children	*Without* children	*With* children	*Without* children	*With* children	*Without* children
TPB	Social Support	0.17***	0.12***	NS	0.09***	NS	0.07*
	Injunctive norm	NS	NS	NS	NS	NS	NS
	Attitude	-0.09*	-0.07**	NS	-0.07**	NS	-0.07*
	Self-efficacy	0.62***	0.68***	NS	NS	0.38***	0.31***
	Intentions	NA	NA	0.69***	0.61***	0.30***	0.25***
		R^2=0. 51, n= 299	R^2=0. 57, n= 875	R^2= 0.50 , n= 298	R^2= 0.45, n= 871	R^2= 0.40, n= 301	R^2= 0.34, n= 879
SCT	Physical environment			NS	NS	NS	NS
	Social Support			0.10*	0.15***	NS	0.08*
	Self-efficacy			0.48***	0.47***	0.58***	0.49***
				R^2= 0.27, n= 298	R^2= 0.29, n= 869	R^2= 0.36, n= 301	R^2= 0.31, n= 879

* p< 0.05; ** p< 0.01; *** p< 0.001
NS= not significant
NA= not applicable
Adjusted for treatment and control groups
Women with children: (self-efficacy: α=.93/ pros: α=.87/ cons: α=.77/ injunctive norm: α=.47/ attitude: α=.19)
Women without children: (self-efficacy: T3 α= .94/ pros: T3 α=.89/ cons: T3 α=.79/ injunctive norm: α=<.70/ attitude: α=<.70)
Missing information on all variables ranged from 0% - 1% for women with and without children.

Table 3-5: Summary of multiple regression results

Theory	Constructs	Outcome					
		Intentions		Stage		Energy Expenditure	
		Women *with* children	Women *without* children	Women *with* children	Women *without* children	Women *with* children	Women *without* children
TTM							
	Pros	NA	NA		**	*	**
	Cons	NA	NA	***	*		
	Self-efficacy	NA	NA	***	***	***	***
PMT							
	Severity						
	Vulnerability		**				
	Fear			**	*		
	RE		**				
	Self-efficacy	***	***		***	***	***
	Intentions			***	***	***	***
TPB							
	SS	***	***		***		*
	INJ						
	Attitude	*	**		**		*
	Self-efficacy	***	***			***	***
	Intentions			***	***	***	***
SCT							
	PE	NA	NA				
	SS	NA	NA	*	***		*
	Self-efficacy	NA	NA	***	***	***	***

* significant at $p< 0.05$; ** significant at $p< 0.01$; *** significant at $p< 0.001$

NA= not applicable; RE = response efficacy; SS = social support; INJ= injunctive norms; PE = physical environment

Chapter 4- Manuscript #2

Not Enough Time? Individual and Environmental Implications for Workplace Physical Activity Programming Among Women *with* and *without* Children

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Abstract

Background: As an independent risk factor for cardiovascular disease, high rates of physical inactivity among women have increased the need for interventions and program implementation. However, demographic differences among women are often not recognized and can have implications for the planning of physical activity programs at the workplace. The purpose of this study was therefore to determine: 1) the main issues employed women *with* and *without* children voice as influencing their physical activity behaviours, and 2) the environmental characteristics surrounding physical activity promotion practices and organizational change within the workplace that are most pertinent to employed women.

Methods: This study included semi-structured focus groups (n=4) with current employed women (n=30), (phase I), and one-on-one, semi-structured interviews (n=4) with workplace senior personnel (phase II). Worksite observations, and a Workplace Physical Activity Audit Tool (WPAAT) administered to the interviewed senior personnel were also included in phase II.

Results: Focus group data indicated that women view physical activity as very important in their lives. Time constraints and demands/responsibilities of both personal-life and work-life, including the workplace environment (e.g., lack of on-site facilities; upper management support), were mentioned as barriers to achieving more physical activity in their lives. The main results from the interviews indicated that health promotion at the worksite is not a high priority, since wellness and fitness activities are not workplace cultural norms.

Conclusion: Suggestions for future physical activity programming goals include establishing support from both employers and employees, targeting programs to employees needs, generating workplace health and wellness as a cultural norm, and increasing the resources to implement further programming strategies.

Key words: environment; physical activity; women; workplace

Introduction

Women's health and physical activity status

Physical activity has been recognized as an important strategy for health promotion and disease prevention (Cameron, Craig, Stephens, & Ready, 2002; United States Department of Health and Human Services [USDHHS], 1996; Women's Health Surveillance Report, 2003). Cardiovascular disease (CVD) contributes to high mortality rates (36% in Canada) (Heart and Stroke Foundation, 2003), and with the prevalence of diabetes on the rise (Centers for Disease Control and Prevention, 2005; Tanuseputro, Manuel, Leung, Nguyen, & Johansen, 2003), the benefits (e.g., physiological, psychological, and overall quality of life) that one can obtain from performing healthy physical activity have grown to be well established (Anderson et al., 1999; Cameron et al., 2002; Heart and Stroke Foundation; Oguma & Shinoda-Tagawa, 2004; Plotnikoff, Hugo, Wielgosz, Wilson & MacQuarrie, 2000; Plotnikoff, Hugo & Cousineau, 2001; Statistics Canada, 2001).

Despite the benefits of physical activity to prevent disease, high rates of physical inactivity among women have increased the need for promoting physical activity interventions and programs (Krummel et al., 2001). More women than men are physically inactive with 59% of women not engaging in regular leisure-time physical activity (LTPA) (e.g., activities performed during spare time), as compared with 52% of men (Cameron et al., 2002), and the prevalence of this behaviour is further decreased among women who are socially disadvantaged when considering socioeconomic and family status (Eyler et al., 2002a; 2002b). The rates of physical inactivity among women are of particular concern considering CVD-related deaths are higher among

women (37%) as compared to men (35%) (Heart and Stroke Foundation of Canada, 2003), and unlike men, these rates are on the rise (Health Canada, 2002). Moreover, diabetes as a risk-factor for CVD has shown to contribute to these fatality rates among women (Brandenburg, Lindenfeld, Reusch, & Regensteiner, 2003; Women's Health Surveillance Report, 2003).

Physical activity and employed women's multiple roles

As a result of the physical inactivity prevalence, particularly among women, the examination and dissemination of strategies to improve the activity levels of the population has become one of the forefronts of health authority agendas nationally, and internationally (Health Canada, 2001; National Advisory Committee on Health and Disability, 1998; USDHHS, 2000; Women's Health Surveillance Report, 2003). However, to date, there have been minimal data to facilitate our understanding of the multifaceted factors that promote or hinder physical activity participation among women (Marcus, Dubbert, King, & Pinto, 1995; Women's Health Surveillance Report, 2003). Furthermore, there are gender differences, as well as disparities among women in different life stages that have yet to be fully explored. The available evidence from a recent meta-analysis suggests that physical activity should be promoted differently to men and women and among women in particular (Oguma & Shinoda-Tagawa, 2004). For example, the multiple roles (e.g., employee, parent, partner, caregiver) that many women take on can impact whether physical activity is achieved, and the amount of activity undertaken (Verhoef & Love, 1992; 1994).

Studies investigating women's social positions have recognized that these roles affect their mental and physical health, (Stuart & Garrison, 2002; Women's Health Surveillance Report, 2003), and while there is an established dose-response relationship between physical activity and the reduced risk of CVD among women, there are still many personal, social, and economic barriers that women face before successfully adopting and maintaining this behaviour (Oguma & Shinoda-Tagawa, 2004; Women's Health Surveillance Report). Being employed, in particular, plays an important role in many women's lives and more women now participate in paid employment than ever before (Women's Health Surveillance Report). Furthermore, women more than men still perform the majority of family and household responsibilities while also being employed and caring for children (Clark, 2001; Gjerdingen, McGovern, Bekker, Lundberg, Willemsen, 2000; Women's Health Surveillance Report). Consequently, employed women do considerably more overall labour than men (approximately 5-10 hours more per week) between their job, household, and childcare responsibilities, especially mothers caring for young children (Gjerdingen et al.).

The multiple roles and responsibilities employed women assume may also trigger more life-changing events that could impact their physical activity behaviour than men or non-employed women (Barnes, Pase & VanLeeuwen, 1999; Gjerdingen et al., 2000). For instance, employed women are exposed to augmented stressors such as physical and mental disorders, musculoskeletal impediments, menstrual ailments, depression, and anxiety (Barnes et al.; Gjerdingen et al.). Employed women are also more likely than men to report a lack of time due to work as a barrier to their physical activity (Cameron et al., 2002), and 38% of married mothers employed full-time report that they experience

serious levels of stress because of time demands, compared to 20% of women without children (Statistics Canada, 2000). It is interesting, however, that parental status has been reported to have little effect on the stress levels among men (Statistics Canada). Furthermore, 46% of employed men report not taking sick days per year as compared to 38% of women who are more likely to be absent for six or more days per year (Cameron et al). Therefore, the success of physical activity promotion among women would benefit from a greater examination of the dynamics between psychological and the socio-environmental factors that influence physical activity behaviour (Oguma & Shinoda-Tagawa, 2004). Furthermore, a recent evidence-based review has highlighted physical activity promotion programs tailored to the specific interest, preferences, and readiness for change as a strong recommendation to limit barriers towards achieving primary prevention of CVD among women (Whitlock & Williams, 2003).

Implications for physical activity programming within the workplace

Interventions within the workplace have been recognized as a pivotal setting to promote physical activity since a large proportion of the population are participating in paid employment and spend a substantial amount of time at work (Health Canada, 2001). In fact, many Canadians are working longer hours and spend most of their waking day at work (Cameron et al., 2002). Women in particular are participating in employed work more than ever before, and a growing number include women with young children (Gjerdingen et al., 2000). However, a gap remains within the literature concerning employed women and workplace physical activity programs. Furthermore, the effects of CVD (Krummel et al., 2001) and diabetes preventive interventions for women

(Brandenburg et al., 2003), have been inappropriately studied in the workplace domain. For example, while several studies have explored the barriers women face in their attempt to incorporate more physical activity in their life, these factors have been relatively unexplored at the individual and environment levels (Marcus et al., 1995; Women's Health Surveillance Report, 2003).

At both the individual and environmental levels, the extent of participation, effectiveness, and quality of workplace physical activity programs is limited in part by important factors unique to women. Most often, demographic differences among women (e.g., women with/without children) are not acknowledged and can have implications for the planning of physical activity programs at the workplace (Marcus, Pinto, Simkin, Audrain, & Taylor, 1994; Miller, Stewart, Trost, & Brown, 2002; Verhoef & Love, 1992; 1994). For instance, the majority of the current knowledge within the workplace and physical activity domain is primarily based on existing studies examining associations between physical activity and chronic disease among Caucasian males (Marcus et al., 1994; Marcus et al., 1995; Chen & Chang, 2004; Women's Health Surveillance Report, 2003). Moreover, many studies in the physical activity domain are generally based on LTPA, with activities performed at work or in the home not being captured through current Canadian surveillance systems (Women's Health Surveillance report) and/or other pertinent research studies. However, some studies have explored non-traditional forms of physical activity or physical activities of daily living (PADL) (such as occupational activity, and household chores) as an alternative method of activity promotion that offers flexibility around women's daily schedules (Marcus et al. 1995; Marcus & Forsyth, 1998; Miller et al., 2002; Oguma, Sesso, Paffenbarger, & Lee, 2002;

Salmon, Owen, Bauman, Schmitz, & Booth, 2000; Women's Health Surveillance Report).

To date, health promotion initiatives addressing physical activity and disease have not taken in to account the entire range of the social and cultural pressures that shape women's participation (Women's Health Surveillance Report, 2003). Although there is research indicating an association between women's multiple social roles throughout life and physical activity behaviour, it remains unclear on how the workplace environment may play a part in influencing overall physical activity behaviour, in combination with other social roles and responsibilities. There has been minimal research focusing on the priorities and needs of employed women and the findings of women's health research are not being adequately communicated to women in formats that are appropriate and useable (Women's Health Surveillance Report). Consequently, there is insufficient evidence to develop workplace physical activity interventions and programs for women that consider their life-stage and multiple role status. As a result, our understanding of women and physical activity has not advanced at the pace needed to meet the public health recommendations put forward by the Surgeon General (National Centre for Chronic Disease Prevention, 1999) and other health authorities (Women's Health Surveillance Report).

Thus, recent recommendations have addressed the need to target studies aimed at decreasing the barriers for women (Women's Health Surveillance Report, 2003). Women have been noted to make health decisions while considering the social and economic environments in which they live and work (e.g., their families, their care-giving, and interpersonal relationships) before considering themselves (Marcus et al., 1995;

Women's Health Surveillance Report). Integrating approaches of individual lifestyle change while addressing issues related to creating supportive environments for women in various life stages (e.g., employment, parenthood) is a suggested strategy for future work in this area.

The purpose of this study was therefore to: 1) determine the main issues that employed women (with and without children) voice as influencing their physical activity behaviours, and 2) determine the environmental characteristics surrounding physical activity promotion practices and organizational change within the workplace that are most pertinent to employed women. To achieve these goals, two research questions were addressed. First, are employed women's multiple roles and responsibilities associated with physical activity behaviour, and if so, how is this association similar or dissimilar between employed women with children and without children? Second, what environmental characteristics (e.g., physical, social, organizational, community, policy) are salient to accommodate workplace physical activity programs for women?

Methods

Phase I

Sample 1: Women Employees

Participants (n=30) were recruited from two large organizations in which a total of four focus groups were conducted consisting of 6-10 women in each group. Current employed women who volunteered to participate and who completed a short demographic questionnaire were accepted into the study. These women were asked about

their age, marital status, parenthood status and employee status (Table 4-1). Most women (67%) were between the ages of 31-55. 57% of the participants were partnered. 77% of women had no children (versus 23% with children). All participants reported full-time employment status with the exception of one part-time employee.

[Table 4-1 About Here]

Focus Group Procedures and Content

A participant recruitment flyer stating details about the study was sent to the champion (e.g., an individual who advocates for and supports physical activity promotion) at each worksite to internally e-mail employees within the organization. Respondents who completed demographic questionnaires were placed into one of the four focus groups. The participants in each of three focus groups were stratified into specific demographic groups using the information obtained from the demographic questionnaires completed by each confirmed participant. Women were grouped into either: 1) single status (no partner) and *without* children under 13 years of age, 2) partnered status and *without* children under 13 years of age, and 3), women *with* children under 13 years of age (single or partner status). The fourth focus group was comprised of a mixed demographic sample of women with and without children who are single or partnered.

Upon group selection, participants were mailed a study information letter and an informed consent to complete and return to the researcher on the day of their focus group session. Focus group dates were pre-arranged with the champions at each worksite prior

to sending information letters and consent forms to participants. The focus groups were conducted at the workplace. A free lunch was provided as incentive for the participants.

During the one hour, semi-structured focus group sessions, participants were asked several questions that targeted social-cognitive perceptions and opinions with respect to physical activity and its relation to multiple roles and responsibilities, and workplace demands. Both individual and environmental characteristics were considered. Specifically, the focus groups examined working women's: 1) meaning and patterns of physical activity, 2) barriers and facilitators to physical activity both at and outside the workplace, 3) opinions with respect to current workplace physical activity events and culture (e.g., opportunities or lack thereof to engage in physical activity at the workplace), and 4), suggestions for building a workplace physical activity program so that it is incorporated into the organizational structure and culture (e.g., identification of ideal physical activity program components while considering both work-life and life outside of work) (Table 4-2).

[Table 4-2 About Here]

A review of the literature on psychosocial constructs found to be most predictive for physical activity among women, particularly employed women, helped to determine the range of possible questions that focused on the individual level. Additional questions at the social, organizational, community and policy levels were modified from a Workplace Physical Activity Audit Tool (WPAAT) (Plotnikoff, Prodaniuk, Fein, &

Milton, in press). The semi-structured focus group method allowed for the expansion and clarification of ideas with several groups of women in a constrained amount of time.

At the completion of each focus group session, the participants were given token gifts (an inspirational scroll and pen) as an appreciation for their contribution to the study.

Phase II

Sample 2: Senior personnel

One-hour interviews were held with 4 full-time senior personnel who had been working in a management position between 4 and 13 years within their organization. Two individuals were interviewed at each of the two worksites selected for the study.

Interview Procedures and Content

Recruitment flyers were internally e-mailed to full-time senior employers by the champions at the two organizations in which the focus groups were conducted. Once the participants identified interest and confirmed their interview date, a study information letter, along with an informed consent and the WPAAT (to be completed and given back on the date of the interview), were mailed to each informant prior to the interviews. The purpose of administering the WPAAT was to: 1) provide the interview participants with information and an understanding of workplace health and physical activity from an ecological perspective, 2) allow for the interview session to be as informative as possible, and 3), provide the researcher with additional data at the environmental level that may

not have been answered through the interview due to time limitations. The interviews took place during a convenient work hour.

The participants were interviewed to determine the organization's capacity and environmental characteristics required to accommodate workplace physical activity programs for women. The semi-structured, one-on-one interviews with senior employers, provided in-depth data on organizational capacity for health promotion interventions. This type of interview offered an opportunity for the participants to speak about political issues that they may not feel free to express among other colleagues.

The WPAAT was used to structure the questions on an ecological framework, integrating aspects of individual lifestyle, social factors, organizational change strategies, policies, and the physical environment that may be affecting the health status of working women (Table 4-3). Some of the questions targeted specific aspects of organizational change and health promotion approaches in three main areas: 1) current status of workplace health promotion (e.g., the priority level of the organization in targeting women's health issues and the degree of openness of employers to deal with women's full range of internal and external determinants of health), 2) social climate for workplace physical activity (e.g., the extent of commitment and participation of both workers and management at different levels of the organization in implementing a physical activity program for women, and 3), the feasibility and strategies to implementing a workplace physical activity program (Plotnikoff et al., in press; Polanyi, Frank, Shannon, Sullivan, & Lavis, 2000). Additional questions addressed the senior personnel's opinions on the appropriateness of the multiple levels of the WPAAT for program planning among employed women.

A bound copy of the WPAAT and a small gift was given to the participants for their participation.

[Table 4-3 About Here]

Worksite Observation Protocol

Observations were conducted at each of the organizations in which focus groups and interviews were held, using a worksite observation protocol (Table 4-4). The protocol was developed based on existing literature (Plotnikoff et al., in press) to provide the researcher with information on the physical work environment and to provide insight in to the organization's work culture. This information also aided the verification and interpretation of data collected through focus groups and interviews.

[Table 4-4 About Here]

Data Recording

Focus Groups

All focus groups were facilitated and tape-recorded by the researcher for later transcription. In facilitating each of the focus groups, the researcher addressed the participants using first names only and aimed to have everyone speak on various questions, one at a time. In support of the researcher, hand held notes were taken by a trained recorder during the focus group sessions. The recorder was unobtrusive while the facilitator aimed to establish a sensitive, trusting and respectful repertoire with the participants. The facilitator modestly included probes when it was felt that the

participants required assistance with deepening their thought processes or when it was required to keep the topic on track.

Upon completion of each focus group, the facilitator and recorder immediately discussed and documented the perceived outcomes of the session to verify the information obtained. In addition, the participants were asked to complete a brief evaluation questionnaire at the end of the session. The questionnaire provided the participants with an opportunity to address their overall experience of the session, and to provide their contact information for data verification purposes if required by the researcher after the focus groups were transcribed.

Interviews

The researcher conducted interviews with senior employers and observed for non-verbal data while also taking hand-held notes. All interviews were tape-recorded and transcribed. The one-on-one interviews allowed for on-site verification of data by providing the researcher with an opportunity to reflect on original points of view and knowledge offered by the participant.

Worksite observations

The observations were conducted through an informal workplace tour given by the champions at each worksite. During the tour, the researcher acted as an observer and aimed to be semi-unobtrusive while visually noting key environmental and cultural surroundings in addition to verbal and non-verbal communications and interactions.

Shortly after the tour, the researcher made field notes that was later organized according to the worksite observation protocol.

Data Verification

During focus groups and interviews, probes were used to confirm participant responses. The hand held notes taken by both the researcher and trained recorder during the focus groups were compared to each of the respective transcripts to also confirm the information obtained. In addition, informal meetings held with the champions at each worksite were held to help verify data and to provide clarity or expand on information that was obtained from both the focus groups and interviews. Worksite observations also served to confirm the data collected with respect to the physical and social environment. Finally, the focus group and interview results were themed and cross-checked by both the researcher and the trained recorder to consolidate the main findings.

Data Analysis

Content analysis was completed based on the transcription of the focus groups and interviews. The analysis followed descriptive exploratory methods to search for patterns, and themes (Neuendorf, 2002; Rothe, 2000) and included the following steps: 1) a surface review to determine what was said by each participant and how it was said, 2) a coding system developed to categorize emergent themes and sub-themes that reflected structures of reasoning for each question, 3) comparisons and overlapping data analyzed between each of the participants, 4) comparisons of data obtained among the focus group and interview participants, 5) the integration of critical and ecological analysis for further interpretation through the use of guiding questions (detailed below in the data

interpretation section). The critical and ecological analysis focused on the structures of power and control (critical assessment), and the social and physical boundaries (ecological assessment), in and outside the workplace environment (Rothe, 2000).

Data Interpretation

Several resources supported the interpretation of data collected from the focus groups and interview sessions: 1) a literature review, 2) worksite observations, 3) informal communications with employees and employers, 4) application of the WPAAT and standard of best practices for workplaces, and 5), the ecological and critical analysis of the data. This final analysis allowed for a deeper and broader understanding of the participants' perceptions, attitudes, and beliefs of their social world. Generalizations and descriptions of the participants' relationship to gender, social culture, physical activity and workplace issues were compared to previous research in the field and where appropriate a new understanding to these issues was generated.

Specifically, the critical interpretation of the findings provided insight in three main areas: 1) the extent employed women act as prescribed by their social roles and responsibilities within and outside the workplace, 2) the allocation of power to control the access to knowledge and participation for physical activity programs in the workplace, and 3), the interests of those being served in the pursuit of workplace health promotion.

The ecological interpretation of the findings provided insight towards how: 1) the workplace is organized to give some people control of physical activity behaviour over others, 2) the workplace is designed to create and sustain ideologies among employed women with respect to physical activity, and 3), employed women get around potential

barriers and workplace demands imposed on their physical activity behaviour by existing workplace culture and guidelines.

Results

Focus Groups

The following are main theme results from the focus groups conducted with employed women (Table 4-5).

[Table 4-5 About Here]

Meaning and patterns of physical activity

Participating in physical activity was valued by all groups of women, and was expressed as a very important aspect in their lives. Several women participated in physical activity for the purposes of improving health. Improvement in health included three aspects: physical (e.g., "losing weight"), mental (e.g., "stress reliever"), and social (e.g., "having fun with others"). Physical activity was also about PADL for some women. In this instance, physical activity was considered as a lifestyle or active living, such as walking to work, or taking the stairs instead of the elevator. Household activities were also mentioned such as "gardening" by partnered women without children. For women with children, PADL included setting aside time to attend to their child/children such as "playing with the kids." For most participants, physical activity meant something that was carried out during their leisure time. LTPA included "setting aside a specific period of time" for structured exercises such as "yoga," "working out at a gym," and/or "group sports."

The majority of women identified themselves as active at least three times a week while considering both PADL and LTPA. This is exemplified by one woman's statement: "My [boxing] classes are at least three times a week, sometimes 5 times a week...but sometimes I go for walks...when it's nice enough...go out and just do things." A few women were also vigorously training either for a fitness competition, or a running race such as a marathon.

Barriers to physical activity

There were several barriers identified to participating in physical activity both at and outside of the workplace. Participants in all groups mentioned time constraints and demands/responsibilities of the job as major physical activity barriers at work. For example, one woman stated: "I wish my body could work on less sleep so that I could have more time to finish my day." The workplace environment (e.g., lack of on-site facilities/ lack of appropriate facilities) was also mentioned by both women with and without children as barriers to achieving more physical activity. One participant expressed that "...the weather is a big factor if you are trying to exercise outdoors...having an on-site facility would help." Outside of work, women without children (single or partnered) indicated that lack of time due to other priorities such going for "groceries", "doing laundry", and commitments with friends, and/or spouses were indicated as physical activity barriers. Partnered women without children added family demands as an additional physical activity barrier. Women with children put a strong emphasis on the competing demands of their children. One woman indicated that "...just doing it [physical activity] around the kid's schedule..." is the "...hardest thing there is."

All groups of women mentioned personal barriers such as lack of motivation or discipline, dealing with an injury or disease (e.g., osteoarthritis), feeling stress and/or tired as barriers of participating in physical activity. One participant reflected on her lack of discipline and said: "At the end of the day it really comes down to discipline...if I really don't want to go [exercise], I'll still find a reason." In addition, a few of the participants who were working full-time and enrolled in a post-secondary school program indicated the demands of school-work as a physical activity barrier.

To further explore the barriers women face, the participants were asked to explain whether it was the combination of their home and work life that made it difficult to be physically active, or did one stand out more than the other. Women without children believed it was the combination of the demands from both home-life (e.g., spouse, elderly parents), and the competitive nature of the corporate workplace culture that made it difficult to be physically active. Both participants with and without children identified their perceived barriers as a social or "a culture thing" that extends beyond work and home life and results in "over-commitments." "Learning to say no" was identified as difficult to do because of the social and cultural pressures to "move up" and "progress" both outside and at the workplace. For example, many of these participants expressed the same sentiment that one woman shared by stating:

Women have a hard time taking care of themselves [e.g., take care of personal health and well-being] because there is a mental and social thing that women take care of other people, whether it's their employers or bosses or co-workers, if your married with children...Why don't we value ourselves...'cause we would drive our kids to soccer, we would drive our sister to the gym, but we won't do for ourselves.

Among women with children, social pressure was also felt, as many women explained the demands that are felt in today's society to be involved in every aspect of their child's life (e.g., school, recreational activities) and the need to provide them with every opportunity possible. One woman explained that the social pressures felt come from social "expectations": "...I mean it's competition, like from the moment they get into playschool, oh well my daughter's already into swimming...and my daughter dances, or speaks four languages or, how about yours?"

Facilitators of physical activity

Conversely, factors that would make it easy (e.g., facilitators) for women to be physically active both at and outside of the workplace were also addressed. At work, the physical environment such as on-site facilities that meet women's needs was indicated as a physical activity facilitator for all groups of women. The socio-cultural environment of the workplace was another theme that emerged as a physical activity facilitator for all groups. Common examples included support/cooperation from upper management, and managers having flexibility with employee work schedules. The social environment was a strong theme outside the workplace. All groups of participants reported making physical activity social or engaging in physical activity with others such as friends or with a spouse/partner made it easier to be physically active. Several women with and without children mentioned the physical environment such as "spring and summer" weather and personal factors such as making physical activity a "priority," and "scheduling" it as part of their day made it easier to be active. Furthermore, all groups of

women indicated that affordable/free access to facilities would facilitate their ability to be physically active.

Workplace physical activity events and culture

Mixed responses were found with respect to the events and culture of workplace physical activity for both women with and without children. Some of the participants felt their workplace provided sufficient opportunities to be active by providing monetary incentives through "wellness accounts" where the organization contributes partial funding for physical activity programs within the community. These participants also identified convenient group programs offered within their workplace such as walking or running groups. However, other women felt the need for their workplace to provide appropriate on-site facilities (e.g., provide light weights, change rooms and showers) and to be given the opportunity to address what they would like offered in a physical activity program offered by their organization. These women also felt that a more supportive and flexible social environment encouraged by upper management was required to promote physical activity. One woman considered how she felt about the lack of employer support: "...there is a lot of lip service being paid...no one is really walking the talk." Further, several women with children felt their needs as working mothers were not fulfilled by their organization. These participants indicated that there was a lack of affordable options, on-site daycare, and flexible time schedules to allow for a more physically active lifestyle.

The responses on the sensitivity of the organizational culture to a women's work life in addition to supporting physical activity were also mixed. Some women with and

without children felt that working full-time was not conducive to personal/family life and that corporate culture promoted aggressive behaviour atypical of the average female who is involved in several commitments outside of their paid work. One woman stated that "...it's the very aggressive person that gets places, not necessarily the most talented and the most competent." Another participant added that "business and making money...is what's important, that's the focus and period." Among the group of women with children, most felt that their workplace was "...not conducive to family life," since work can often be brought home, or the weekends are spent at work. In contrast, other women with and without children reported that company support with respect to taking time for physical activity and other non-work related activities was largely dependent on management style and whether or not their manager was family-oriented or life-balanced. One woman indicated:

> There's some people who I work for now...really respect the free time or the leisure time...the non-work time. I have also worked for somebody who has completely, as much as I hate to say it, ignorant of that...even things as bad as I've got a doctor's appointment I have to leave at 3:30, didn't matter.

Building a workplace physical activity program

Finally, suggestions were made towards building a physical activity program in the workplace that considers both aspects of work-life and daily life outside of work. Participants were asked to describe changes they would like to see made in order achieve a more physically active lifestyle and to depict their ideal workplace physical activity program. All groups of women specified the desire for more leisure time and less work

and home commitments as the major change they would like to make to their lives. Altering society's cultural system was also indicated by all groups who described the value/expectations placed upon women as caregivers and the lack of attention paid to taking care of themselves. Also, the majority of participants with and without children mentioned an on-site gym/facility at work and/or affordable access to community facilities as an important component of their physical environment. Characteristics of the socio-cultural environment at work were described as essential by all groups of women and included: creating a "supportive"/ "encouraging" corporate culture for physical activity, incorporating "flexible work hours," "management role modeling", "less demanding expectations," and "mandatory non-working lunches."

Increasing economic incentives (e.g., greater subsidized gym memberships), and considering the impact of long working hours among women with children was also suggested among this group. For example, "making allowances" for working mothers was mentioned by one woman who explains:

I'm perfectly okay to spend my own time working out if I actually can rely on having it, and I don't need to spend every single moment of my not 8 hours during the working day with the kids, but if my working day is 10 hours, well then I'm not going to spend any more time away from the kids...if really and truly this was a place where I can come in at 8 and leave at 5, or come in at 7:30, work out for an hour and a half at lunch time and leave at 5...[I would]...feel perfectly okay and confident.

Moreover, a few participants with and without children believed that the changes they want implemented would only occur when workplace education about the benefits of physical activity were adopted and supported. Implementing workplace policies in

addition to government legislation that supports active living for female employees, were also suggested as strategies to carry out these changes.

One on one interviews

The following are main theme results from the interviews conducted with workplace senior personnel (Table 4-6).

[Table 4-6 About Here]

Current status of workplace health promotion (priority level and degree of openness)

Overall, the interviewees did not convey that health promotion is a high priority at their workplace. The participants believed wellness and fitness activities (e.g., health newsletters, "wellness accounts," community events) were implemented more on business ideals (e.g., not a mandated part of the organization's culture) rather than on health as an ideal cultural norm. One interviewee stated:

There's a department in the company that I know does look at these things and work hard at it, to try to get newsletters out, making the access to fitness facilities...but it's very much at a corporate level than a day to day lever...it's not something that ever comes down to the managerial level or working level that you incorporate you're your day to day work and adopting it as a culture.

However, mixed responses were given when the interviewees were asked about the degree of openness to deal with women's health issues at both the employee and employer level. While most interviewees felt that there is a general openness at both the

employee and employer level to "...get everyone active" regardless of sex, one interviewee felt that "...most employers from the top down don't believe in fitness and wellness" at their organization. Furthermore, the responses by two other interviewees also included that the degree of openness is dependent on the type/nature of work. For example, one of the worksites in this sample was diverse with respect to the employees' nature of work (e.g., regimented and strict on-site attendance by shift workers/call centre employees versus the on-site flexibility marketing/human resource employees maintain). The participants from this worksite also considered the diverse nature of the organization and specified the lack of implemented programs and policies that are employee focused.

Social climate for workplace physical activity

Most interviewees expressed their perception of a poor social climate with respect to physical activity within the workplace. The social setting among both employees and employers, usually did not encourage women to be physically active due to 1) management not valuing wellness, and 2), the demands, pressures, and multi-tasking employed women experience. All interviewees stated that there was no will/desire in their organization to promote physical activity for women due to a lack of corporate/upper management drive. Two of the interviewees felt there had not been an "organizational will" to promote physical activity for women since the majority of the employee population at their workplace was male. Yet, one interviewee indicated that if a program idea were to be "sold" the right way, there would be a desire to follow through with a physical activity program tailored for employed women. With respect to the

demands, pressures, and multi-tasking experienced by employed women, one interviewee stated that:

> The stressors on them [female employees] are greater [than male employees], I don't think they have necessarily the time to invest in stuff like that...typically...physical activity or active living will be the first thing a woman forgets about.

Feasibility and strategies to implementing a workplace physical activity program

All interviewees felt that if a physical activity program were to be in place for women, it would be successful since the general health promotion activities already in place have done moderately well among women employees. Several suggestions were provided on how to successfully implement health promotion activities for women within the workplace (specifically with respect to the promotion of physical activity): 1) directly impacting the employee (e.g., through the bonus structure), 2) incorporating health and wellness in to the organizational culture, 3) taking a business perspective to "sell" health and wellness ideals, 4) receiving support from both employers and employees, 5) peer support, 6) targeting programs to employees' needs and wants (e.g., targeting active and inactive individuals), 7) increasing resources to improve programming, 8) providing incentives such as cheaper benefits packages, 9) sending reminder messages by the computer, 10) expanding the role of health and/or fitness personnel, 11) inviting participation from community experts to provide education, 12) creating a tracking system within established programs to determine points of future action, and 13) reducing the work load so that it is a "people first, not business first, work ethic."

Additionally, all interviewees felt that the WPAAT, would be an appropriate resource for the planning and evaluation of a physical activity program for women. The WPAAT was described as by one participant as "a useful corporate tool" and "...there may be a cost benefit over time..." to using it.

Worksite observations

Worksite observations determined similar aspects of the physical and social environment in both workplaces. Within a downtown corporate setting, only those with security allowances (e.g., permission from security officers on the main floor for quests, and/or swipe card access to offices) were permitted to enter and travel by elevator to upper floors. The physical environment was set up such that managers had their own office space, while employees worked among cubicle areas. Furthermore, most employees and employers were grouped on the same floor according to their department designation. During the observation, most employees were visibly working without much social interaction. Physical activity resources such as bike racks, signs promoting stairway usage, and other physical activity related posters within the worksite were not visible. However, one worksite included a small on-site facility. At the time of the observation, a small number of employees were exercising on bikes, or treadmills. The facility also included a few weight machines, and change rooms.

Discussion

The purpose of this study was two-fold. First, we aimed to determined whether employed women's multiple roles and responsibilities are associated with physical

activity behaviour, and if so, how is this association similar or dissimilar between women with children versus women without children. Second, we aimed to identify environmental characteristics to accommodate workplace physical activity programs for women. In the context of these two main research aims, the following discussion will consolidate the focus groups and interviews using both a critical and ecological interpretation.

Multiple roles/responsibilities and physical activity

With respect to the first research aim, it is clear that an association exists between the multiple roles employed women assume in their work and home life (e.g., employee, parent, partner, caregiver) and their participation in physical activity. Lack of time due to work, family, or other obligations was the main barrier to for those with and without children and dictated the amount of physical activity achieved. Other common barriers included lack of motivation, coping with an injury or disease, lack of/or inadequate resources (e.g., exercise facilities, financial status, subsidized day-care, upper management support), and inadequate flex-time at work to exercise. These barriers have also been cited among both employed and non-employed women in previous research (Eyler et al., 1998; 2002a; 2002b; Gjerdingen et al., 2000; Pinto, Marcus, & Clark, 1996; Women's Health Surveillance Report, 2003). Although barriers to physical activity participation were similar between women with and without children, the issues surrounding increased family obligations for women who had children set the main differences between women with and without children. Women with children reporting a greater lack of time to be physically active in comparison to women without children has

also been documented in prior research (Eyler et al., 1998; Gjerdingen et al., 2000; Kushner & Harrison, 2002; Miller et al., 2002; Verhoef & Love, 1992; 1994).

To better understand how to address the physical activity barriers that employed women experience within the context of their multiple roles, it was also important to consider their meaning of physical activity and typical patterns. All groups of women valued physical activity, and several of these participants identified health reasons for being active. In addition, physical activity for all groups included both PADL and LTPA. However, the challenge in finding time to be active seemed to be mostly related to LTPA, since this was the most commonly cited type of activity pattern among both women with and without children. Given that PADL are normally a typical part of a woman's day, home and work-related responsibilities may provide a greater challenge to perform LTPA. Other studies have similarly reported the importance of promoting both PADL and LTPA among groups of women who may experience limited leisure time for activity, particularly among women with children (Eyler et al., 1998; 2002a; 2002b; Miller et al., 2002; Scarff, Homan, Kreuter, & Brennan, 1999; Sternfeld, Ainsworth, & Quesenberry, 1999).

Furthermore, the challenges of being physically active were difficult not only because of inherent family needs or work deadlines, but also because of the social pressures to achieve a degree of success as a working-woman. For instance, all groups of women alluded to society valuing the need for women to care of others, and the desire to achieve more in personal and career life which minimized their time for physical activity. These sentiments have been replicated in other research denoting that the daily lives of working women are being shaped by social and corporate trends that tend to restrict

rather than encourage physical activity (Marcus et al., 1995). The workplace setting has also been cited to value the nurturing and supportive roles that women often full fill, yet these women have also been conflicted by exercising the power to demonstrate leadership and independence since these are often praised as masculine attributes (Adebayo & Udegbe, 2004; Kushner & Harrison, 2002; Turkel, 2004). It is not surprising therefore, that the women in this study had difficulty finding time for physical activity with the pressure to succeed in an exceedingly competitive, and not always supportive socio-environment.

The socio-environment

Recognizing that social and environmental contexts can influence the choices made by individuals creates implications for workplace health promotion. As a result of women responding better to recommendations based on both PADL and LTPA, strategies to increase the energy expenditure of everyday activities have been recognized as a way to improve exercise and fitness in women who find it a challenge to take time out of their busy day (Krummel et. al., 2001). With respect to the second aim of this study, both the focus groups and interviews provided the socio-environmental issues that were most pertinent to implement and sustain a successful workplace physical activity program for employed women. The key aspects to building and facilitating a comprehensive program included: eliciting support from both employers and employees, targeting programs to employees needs, generating workplace health and wellness as a cultural norm, and increasing the resources (e.g., economic incentives) to maintain and implement further programming strategies.

While characteristics of essential program components were identified, the results from the focus groups and interviews indicated that workplace health promotion was not a high priority. There was the perception of a poor social climate for workplace physical activity since this was not a cultural norm. Upper management primarily controlled the access to knowledge and participation in workplace physical activity programs that primarily served the interests of employers to receive a positive image within the community. Further, most physical activity programs were not endorsed by employees and several women in the focus groups stated they would have appreciated the opportunity to provide feedback on the types and quality of current programs. Many of the focus group participants felt their workplace was not conducive to all females since the physical activity programs/resources (e.g., yearly corporate challenges, lack of appropriate weights in the on-site fitness facility) sanctioned a competitive nature within the workplace. These programs were viewed by the participants as being geared towards the aggressive-male personality. The participant's perceptions may have been due to the domination of male decision-makers occupying the majority of upper management positions. Moreover, supervisory and management positions within corporate offices for the most part incurred greater time and space flexibility for LTPA over other employees, (particularly shift workers, off-site employees, and those with young children obtaining minimal resources for child care) which may have deterred workplace physical activity from becoming a cultural norm.

The socio-environmental results of this study concur with the current nature of many workplaces. Although the trend for workplace health and wellness has achieved greater recognition in recent years, few organizations have adopted this practice into their

work culture, which has minimized employees' access to physical activity programs at work (Cameron et al., 2002). For this reason, it's reasonable to assume that women's physical activity patterns were influenced in part by their difficulty to overcome time constraint barriers due to due to the fast paced and competitive nature of corporate organizations.

Furthermore, several women with and without children experienced inadequate support for attempting to balance both their personal and work life. These women's perceptions provide insight on other research findings, reporting that employed women's physical activity (and health) events are influenced by: the spending priorities of governments, the extent to which government and corporate services provide to women's needs and interests, and the degree to which women are supported in equity (Raphael, 2002). According to a comparative policy analysis of Canadian women's quality of life, women's total work time (e.g., paid and unpaid work such as household and care-giving duties) is coupled with inadequate policies that support compatibility of work and bringing up children in Canada (Raphael). The report denotes Canadian provincial governments as not providing enough subsidized child-care for most families who still must use private and unregulated child-care services. Further, the quest for family-friendly workplaces on the part of employers was found to provide minimal efforts in aiding the child-care dilemma in Canada (Raphael). The testimonies of several women in this study provided direction into how employed women can be better supported in balancing their multiple roles. Community/workplace education and policy implementation as aids towards achieving an optimal physical activity and health status were suggested among both women with and without children.

While suggestions have been made to facilitate a workplace physical activity program among women, the benefits of implementing these programs will continue to be limited without the integration of a broader and multi-level approach (Polanyi et al., 2000). For effective change to occur specifically among women, workplace health promotion programs have been requested to shift focus from viewing health as the absence of disease or illness, and recognize that physical activity as a lifestyle is influenced by "life chances" (e.g., choices made by individuals can be influenced by the socio-environment in which they live) (Frohlich & Potvin, 1999, p. S13). In acknowledging the external factors that may influence the behavior of individuals, multi-level models and interventions (e.g., ecological frameworks) have been developed (Gauvin, Levesque, & Richard, 2001; McLeroy, Bibeau, Stecler, & Glanz, 1988; Sallis & Owen, 2002).

However, there have been limited studies examining ecological approaches to promoting physical activity among women (Eyler et al., 2002a; 2002b; King et al., 2000), particularly ones that can be used as frameworks within workplace settings (Campbell et al., 2002; Tessaro et al., 1998; 2000). The few workplace health promotion interventions that have targeted multi-level strategies (e.g., management support, social environment, organizational resources, marketing, and perceived barriers and facilitators) have revealed an increase in physical activity program participation levels, especially among female blue-collar employees (Campbell et al.; Tessaro et al., 1998; 2000) and other minority and lower paid employees (Crump, Earp, Kozma, Hertz-Picciotto, 1996). Moreover, the operationalization of ecological frameworks have been cited as more

successful at increasing physical activity for cardiovascular disease prevention then single-level interventions (Heirich, Foote, Erfurt, & Konopka, 1993).

The WPAAT and its standard of best practices is one ecological framework that shows promise for the promotion of physical activity among employed women. Results from the interviews provided positive feedback on the utility of the audit tool as a useful framework to establish a workplace physical activity program. Further, employed women mentioned several characteristics that the audit tool addresses when they provided suggestions on the design of an optimal workplace physical activity program and the kinds of things the workplace can do to accommodate for a more active lifestyle. The audit tool takes into consideration a variety of social and environmental factors that can be generalized to a variety of groups, and as such, this tool serves as a useful framework for employed women.

More research, however, is warranted in workplace health promotion with respect to women and physical activity. There is limited research on the influence of social roles, particularly role overload (e.g., feeling strained by taking on too many responsibilities) and balancing roles within the physical activity domain. Furthermore, interventions targeting the environmental influences of the workplace are required to examine employee sex-role stereotyping and how this impacts physical activity behaviours and wellbeing. Investigating how physical elements of the environment effect activity levels among employed women has also received minimal research attention. In lieu of several women indicating the importance of accessing appropriate fitness facilities, further work in this area will contribute to how features of the workplace physical environment mediate behaviour among this population. In identifying pertinent physical activity

program requirements for this population, it is also essential to determine what 'health' means to the organization, and the extent to which physical activity and women's needs and interests is a priority for that organization. Additionally, it is important to identify the 'nature' of the workplace, in terms of its bureaucratic and non-bureaucratic processes. Understanding whether the workplace is used as setting/structure for change (where conditions outside the individual control are ignored) or as an entity in which people are recognized to be acting within a greater social system is pertinent to implementing organizational developments (Fox, 1994).

Strengths and limitations

This study extends the research knowledge among employed women and the workplace physical activity domain. Among limited physical activity and qualitatively-focused studies, this paper examines sub-groups of employed women while considering individual and environmental aspects of both personal and work life. Accordingly, this study indicates that benefits to wellbeing for women participating or who want to participate more in physical activity may be limited when negative attributes of their individual social roles are experienced (e.g., time demands creating excess stress and limiting leisure time). The limited support women receive from their social context (e.g., limited workplace and government policy and programs) may also counteract positive gains to physical activity and wellbeing.

Although most women found it challenging to be active as they desired, their current physical activity levels were atypical of the general female population. Indeed when considering both LTPA and PADL, most of these women were likely meeting or

close to meeting public health guidelines. Participants self-selecting themselves in an area that is already of interest (e.g., physical activity) should be recognized. This study could have been strengthened by including perspectives of individuals who are sedentary and future research in this area should aim to address participant recruitment strategies for qualitative assessment of inactive employed women.

Furthermore, this study was conducted primarily with Caucasian employees in large corporate settings. The degree to which the issues were addressed may not be entirely generalizable to other ethnic groups of employed women and those in non-traditional employee settings (e.g., contract positions), blue-collar worksites, and/or small organizations. Research in this area is limited. Further work among minority employed women would benefit the physical activity and workplace domain since few worksite health promotion programs have been designed to attract and meet the needs of these women (Campell et al., 2002; Tessaro et al., 1998; 2000).

Implications for practice

It is anticipated that this research will contribute to and guide health promotion practice among managers and practitioners, policy-makers, and researchers within the workplace and physical activity realms of science. This study recognizes the need for further work in the physical activity and workplace area, specifically among women. The unique barriers and facilitators that employed women face due to their multiple roles and responsibilities have implications for program planning within the workplace. It is important to note that a physical activity program needs to extend beyond offering fitness classes and community subsidy to facilities. Employer support and workplace cultural

norms may also greatly influence program-planning initiatives, and should be considered. Program planning should be sensitive to specific demographic characteristics and the social-environment both at and outside the workplace when working with employed women. This study provides the descriptive information necessary to work towards more effective programming agendas.

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Table 4-1: Demographic characteristics of focus group samples

Demographics	**Total N= 30**
	n(%)
Employment status	
Full time	29(96.7)
Part time	1(3.3)
Marital status	
Partnered	17(56.7)
Single	13(43.3)
*Age range**	
<20	1(3.7)
21-25	2(7.4)
26-30	6(22.2)
31-35	4(14.8)
36-40	4(14.8)
41-45	4(14.8)
46-50	2(7.4)
51-55	4(14.8)
Children status	
Single, no child	12(40.0)
Partner, no child	11(36.7)
Either partnered or single, with child	7(23.3)

* missing: n=3

Table 4-2: Focus group questions

1. What does being physically active mean to you?

2. How important is it to you to be physically active?

3. What kinds of things make it difficult for you to be physically active?
   a) at work
   b) outside of work

4. What kinds of things would make it easy for you to be physically active?
   a) at work
   b) outside of work

5. Is it a combination of work life and home life responsibilities that can influence your physical activity, or does one stand out more than the other? If yes, why? If no, why not?

6. Do you feel that your workplace provides you with information and opportunities to be physically active? *If yes, why? If no, why not?.*

7. Do you think the culture at your workplace is sensitive to a woman's work life? *If yes, why? If no, why not?*

8. If you had an opportunity to enjoy being more physically active in your life, what changes would you make?
   a) at work
   b) outside of work

9. If you had an opportunity to design your own physical activity program in your workplace, what would it look like? *Probe: What can the workplace do to help you incorporate a more physically active lifestyle?*

Table 4-3: Interview questions

1. During your time here, to what extent has health been actively promoted?

2. Have there been previous health promoting programs in place? *If yes, what kind of programs? How long did they run for?*

3. How much of a priority do you believe health promotion is at your workplace, especially for women?

4. Is there a degree of openness to deal with women's health issues at the
   a) employee level?
   b) employer level?

If yes, how is this demonstrated? If no, why not?

5. Do you feel that there is a positive social climate within your workplace that encourages women to be physically active?
   a) among employees?
   b) Among employers?

If yes, why? If no, why not?

6. Do you feel that there is a will/desire within the organization to promote physical activity for women? *How come?*

7. What do you believe would have an impact on the success and effectiveness of health promotion activities for women (especially with respect to the promotion of physical activity) within the workplace?

8. Do you think that the WPAAT is an appropriate resource for the planning or evaluation of a physical activity program for women at your workplace? *If yes, why? If no, why not?*

9. Are there partnerships between the community and your workplace to help encourage physical activity for women? *If yes, what are some examples*

10. If there were to be a program in place for women, do you think that it would be successful? *If yes, why? If no, why not?*

Table 4-4: Worksite observation protocol

1. How are the work stations organized? (e.g., are there isolated cubicles, office spaces, open and shared space)
2. How is the workplace as a whole designed? (e.g., who gets office spaces, who gets cubicles or smaller work spaces, are there codes/permission needed to get through certain spaces, are there floors/space designed specifically for certain individuals or work teams)
3. Does there seem to be a positive social climate among employees? (e.g., are employees smiling, do they portray an open and friendly manner, generally, and with one another)
4. Does the work environment promote a positive social climate among employees? (e.g., are there postings with announcements of social, physical activity, and/or wellness events)
5. Are there workplace physical resources that support physical activity? (e.g., are stairwells clean and safe, are the grounds safe and attractive for walking)
6. Are there workplace facilities that employees can access in order to be physically active? (e.g., bike racks, exercise room, lockers)

Table 4-5: Focus Group Results

Question	Group	Themes	Number of women identified	Related concepts/comments
To me being physically active means...	Single women (n=9)	Health	1	- losing weight, gives energy, feel better about self
		Physical Activities of Daily Living Unstructured activity/Active living	3	- walking, stretching, getting out of the house, walking to work
		Leisure-Time Physical Activity/Structured Exercise	3	- group sports, individual sports, pilates, yoga, gym, setting aside a specific period of time
	Partnered women (n=9)	Health	2	- to sweat, feel good, fitness, fun, increased stamina, less grumpy, less frustrated, less anxious
		Physical Activities of Daily Living • Unstructured activity/Active Living • Household Activity	4	- walking, getting active, moving, gardening, taking the stairs, parking far away and walking
		Leisure-Time Physical Activity/Structured Exercise	5	- yoga, resistance band training, cardio, aerobics, pilates, weight training, regular exercise program, fitness competition
	Women with children (n=6)	Health	4	- comfortable, raises resting heart rate, physical/mental well-being, stress reliever, sweat, to tire yourself, achieving some level of fitness, weight control

Question	Group	Themes	Number of women identified	Related concepts/comments
		Physical Activities of Daily Living	3	
		• Unstructured Activity/Active Living		- running, walking, getting off the couch, walking the dog, activity as a lifestyle
		• Household/childcare activity		- playing with the kids
		Leisure-Time Physical Activity/Structured Exercise	4	- tae-kwan-do, marathon training, cardio
	Mixed (n=6)	Health	9	- working up a sweat, heart rate up, improve heart health, keep weight down, keep blood pressure low, stay young, makes me feel good, decrease risk of disease, keep me in shape, keeps me mentally happier, keeps metabolism in check, maintains sleeping patterns, don't feel drained
		Physical Activities of Daily Living	4	
		• Unstructured activity/ Active Living		- walking, lifestyle, way of life, parking and walking, walking to work
		• Household/childcare activity		- time with kids
		Leisure-Time Physical Activity/Structured Exercise	8	- treadmill, cardio, yoga, running, bicycling, weights, working out at a gym, indoor rock climbing, golf, sports, skiing, dragon boating, regularity, following the physical activity guide (e.g., 20 mins/3 times/wk)
How important is it to you to be physically active?	Single women	Very important	5	- need to make it a priority
	Partnered women	Very important	4	- make time, make it a focus/priority

Question	Group	Themes	Number of women identified	Related concepts/comments
	Women with children	-	-	-
	Mixed	Very important	6	- both personally and health-wise, really like being active, important for health reasons, great escape from rest of life, get "me" time
What kinds of things make it difficult for you to be physically active? **a) Work** **b) Outside of Work**	Single women	a)		
		• Time Constraints	2	- deadlines, no opportunities for breaks
		• Demands/Responsibilities	1	- deadlines
		b)		
		• Time Constraints	1	- no time
		• Demands/Responsibilities	2	- not a priority due to other commitments, school, laundry, groceries, errands
		• Physical Environment	1	- winter weather
		• Personal (Physical/Psychosocial)	4	- tired, lack motivation, procrastination, injury/disease, older age, stress
	Partnered women	a)		
		• Time Constraints	3	- working hours at home, long work days, work restricting hours
		• Demands/Responsibilities	1	- work/stress load
		b)		
		• Time Constraints	3	- lack of time
		• Demands/Responsibilities	5	- family demands/schedules (husband/friends), school demands
		• Physical environment	2	- weather
		• Personal (Physical/Psychosocial)	1	- stress, tired, lack of motivation, laziness

Question	Group	Themes	Number of women identified	Related concepts/comments
a) Work b) Outside of Work	Women with children	a)		
		• Time Constraints	4	- restricted lunch hour, no flexibility, working full-time
		• Demands/Responsibilities	4	- being tied to your phone, cultural norms (expected to be at desk during lunch)
		• Physical Environment	2	- lack of facilities
		b)		
		• Time Constraints	1	- no time
		• Demands/Responsibilities	5	- other priorities (family), home/life schedule (kids, housework, errands), driving kids around
		• Socio-economics	1	- lack of money
		• Personal (Physical/Psychosocial)	2	- wanting sleep/tired
	Mixed	a)		
		• Time Constraints	3	- working through lunch hour
		• Demands/Responsibilities	4	- job commitments, no opportunity (sitting at desk all day), work load, unpredictable work day
		• Physical environment	1	- no access to facilities
		b)		
		• Time Constraints	1	- lack of time,
		• Demands/Responsibilities	3	- family/life commitments, other priorities, appointments (personal, children), homework with kids, demands from spouse, driving children around, work around the house, taking care of elderly parents
		• Personal (Physical/Psychosocial)	3	- injuries, no motivation

Question	Group		Themes	Number of women identified	Related concepts/comments
What kinds of things would make it easy for you to be physically active? **a) Work** **b) Outside of work**	Single Women	a)			
			• Physical Environment	2	- on-site gym, access to convenient facilities, gender-specific equipment
			• Socio-cultural Environment	1	- cooperation from company
			• Economic incentive	1	- free access to facilities
		b)			
			• Physical Environment	1	- weather, daylight
			• Social Environment	1	- putting social events around physical activity
			• Personal (Physical/Psychosocial)	1	- if scheduled, making it a priority
			• Economic incentive	1	- affordable
	Partnered Women	a)			
			• Physical Environment	1	- on-site facility
			• Socio-cultural Environment	2	- flexible employer, having more time
			• Economic incentive	1	- affordable, decreased cost (company paid for half)
		b)			
			• Physical Environment	2	- summer weather
			• Social Environment	3	- doing activity with other (husband/friend), social support, social/group activity, motivation from others
	Women with children	a)			
			• Physical Environment	2	- on-site facility, open staggered lunch
			• Socio-cultural Environment	1	- change in cultural norms, flexible hours
		b)			
			• Personal (Psychosocial)	1	- scheduled
			• Economic incentive	1	- activities that are paid for
	Mixed	a)			
			• Socio-cultural Environment	4	- reduce work hours, flexible hours, 2 hour lunches, getting away for the rat race (less pressure, demands, meetings), respecting lunch hours as personal time

Question	Group		Themes	Number of women identified	Related concepts/comments
		b)			
			• Social Environment	1	- motivation from spouse, social support
			• Personal (Physical/Psychological)	1	- setting aside me time
Do you feel that your workplace provided you with information and opportunities to be physically active?	Single women		Yes	1	- monetary incentive, available programs, support
			No	1	- need surveys to meet needs of employees, need convenient access to facilities, corporate expectations/ obligations, increased demands-less time
	Partnered Women		Yes	2	- Running club, learn to walk club, wellness accounts, running room clinics
			No	2	- need available facilities, need more mental reminders about events/opportunities
	Women with children		Yes	2	- wellness accounts, run/walk club, wellness newsletter, wellness program, weight watchers, learn to run program
			No	3	- need on-site facilities, need more time, more affordable options, on-site daycare
If you had an opportunity to enjoy being more physically active in your life, what changes would you make? **a) Work** **b) Outside of Work**	Single women	a)			
			• Time Constraints	1	- more time, work less
			• Demands/Responsibilities	1	- not so many commitments
		b)			
			• Personal	3	- need discipline, motivation, not so tired/more energy, enjoyment
			• Culture	2	- women have traditional role of caretaker, need to value ourselves (see ourselves as important)

Question	Group	Themes	Number of women identified	Related concepts/comments
	Partnered Women	a)		
a) Work		• Time Constraints	3	- more time, more flexible hours
b) Outside of Work		• Demands/Responsibilities	1	- less workload, less stress at work
		• Physical Environment	2	- programs available on-site, group programs
		• Socio-cultural Environment	4	- flexibility to take time off for physical activity, more flexible hours, more acceptable corporate culture, workplace encouraging balance, more flex days
		• Economic Incentives	2	- having a better workplace health plan
		b)		
		• Demands/Responsibilities	1	- less home demands
		• Social Environment	2	- social support, activity with other (i.e. husband)
		• Culture	1	- women seen as caregivers/taking care of everyone else instead of themselves
	Women with children	a)		
		• Time Constraints	5	- 37.5 hour work week, no overtime, flexible hours
		• Physical Environment	1	- change physical environment in workplace: more space, more ergonomic, more lounge areas
		• Socio-cultural Environment	2	- no working lunch hours, flexible hours, no guilt about leaving
		• Economic Incentives	1	- larger fitness/wellness accounts to help buy equipment
		b)		
		• Demands/Responsibilities	1	- body can't run off less sleep (busy taking care of responsibilities)
Do you think the organizational culture is sensitive to a women's work life?	Women with children	Yes	1	- understanding management, flexibility (can work form home when needed), progressive, family-oriented/life balanced
		No	3	- not conducive/accommodating to family life

Question	Group	Themes	Number of women identified	Related concepts/comments
	Mixed	No	3	- male organization, only the aggressive move up
		Dependent on management	3	- some people are – others are not, need more open communication
Is it the combination of your work life and home life that may influence your activity, or does one stand out more than the other?	Women with children	Both at work and outside of work	2	- Busy at work (work deadlines) and home (demands/needs of spouse, children, extracurricular activities)
		Social pressures outside of work	3	- having a hard time saying no, pressure of being a good parent, to volunteer, fundraise for children's school, to provide every opportunity (stemming from competition with others, and pressures from media
	Mixed	Work	1	- corporate culture, development and competition to move up, work demands
		Social pressures outside of work	2	- demands from kids, family members (spouse, elderly parents)
		Culture	1	- focus on others – not self
If you had an opportunity to design your own physical activity program in your workplace, what would it look like?	Women with children	Physical Environment	4	- On-site gym/classes, fitness breaks, access to daycare
		Socio-cultural Environment	5	- more time & less expectations, corporate culture that thinks physical activity is important, executive role models, mandatory not-at-desk lunches, making allowances for working mothers
		Economic incentive	6	- bumping up the wellness fee, less stringent on what wellness fees can be used for, bulk deals on equipment/memberships

Question	Group	Themes	Number of women identified	Related concepts/comments
Probe: What kinds of things can the workplace do to incorporate a more physically active lifestyle?	Mixed	Physical Environment	3	- on-site facility, flexible hours
		Socio-cultural Environment	5	- acceptability/encouragement/respect form co-workers and management for physical activity (change in workplace culture), communication of needs, flexible work hours, performance assessment on work/life balance, modeling from management, educating people
		Personal (Physical/Psychosocial)	4	- learning to say no
		Policy	2	- legislation, education

Table 4-6: Interview Results

Questions and probes	Themes	Related concepts/comments
During your time here, to what extent has health been actively promoted?	• Within the last 4-5 yrs • 10% of the population has participated • moderate	Not very active or aggressive; not a big part of the portfolio
Have there been previous programs in place? *If yes, what kind of programs? How long did they run for?*	Yes	Programming, onsite gym, fitness coordinator health newsletters; sponsorships; wellness accounts
How much of a priority do you believe health promotion is at your workplace, especially for women?	Not a high priority	• Need to target and encourage the inactive, provide discounts for fitness clubs, create more awareness, endorse goals, setting up targeted programs specific to women • Wellness and fitness activities are very much at a corporate level than a day to day work culture
Is there a degree of openness to deal with women's health issues at the: a) *employee* level? b) *employer* level? *If yes, how is this demonstrated? If no, why not?*	a) • generally yes • depends on the type/nature of work (i.e. shift workers can't just leave the site during work hours) b) • generally yes/somewhere in between: the company is open and supportive to get everyone active, depending on the job you have (i.e. you may have to stay on site and its not as easy to take part in activities) • no, most employers from the top down don't believe in fitness and wellness	• progress has been gradual • The company is trying to make sure the programs and policies are employee focused and driven, however there is the perception that programs are developed and implemented without talking to any of the employees (some of this is true, and some is not).

Questions and probes	Themes	Related concepts/comments
What do you believe would have an impact on the success and effectiveness of health promotion activities for women (especially with respect to the promotion of physical activity) within the workplace?	• targeted programs (i.e. for women, for active and inactive individuals) • use of different incentives • a tracking system to tailor messages and action points • expand role of fitness coordinator • exposure from top-down • peer support • invited speaking groups related to health and wellness • reminder messages on computers • reducing work load • people first, not business first work ethic directly impacting the employee (i.e. through bonus) • incorporating health and wellness in to the organizational culture • take a business perspective to "sell" health and wellness ideals • support from employers and employees • target programs to employees needs and wants • increase resources to increase programming • provide incentives (i.e. benefits packages being cheaper because you are part of a program)	
Do you think that the WPAAT is an appropriate resource for the planning or evaluation of a physical activity program for women at your workplace? *Why/ why not?*	Yes: • needs to be actively used and disseminated to staff to encourage the belief in fitness and wellness; it is primarily women here • similar to what is being done now and overtime there is a cost benefit; it is a useful corporate tool	

Questions and probes	Themes	Related concepts/comments
Do you feel that there is a will/desire in the organization to promote physical activity for women? *How come?*	No: • no one has considered this since the organization is 80% male and typically thinking about the aging and labor intensive workforce • no corporate drive for this; there has been efforts made in head office but does not extend to the entire organizations	If it was sold the right way, there would be desire to follow through Corporate drive is growing, but at a slow pace
Do you feel that there is a positive social climate in the workplace that encourages women to be physically active? a) among employers/upper management? b) among employees? *Why/why not?*	a) Depends: • there are those who are but don't walk the talk; others who are but don't have the power to change things; and those who care about making money and not wellness b) No: • no support among co-workers/ there are certain individuals who encourage others but are restricted by the work ethic of certain departments • the stressors are greater in areas that are predominately women and they don't necessarily have the time to invest in physical activity	No, due to the demands, pressures, and multi-tasking that limits the time for physical activity/ active living will be the first thing a woman forgets about
Are there partnerships between the community and your workplace to help encourage physical activity for women? (i.e., activities, special events planned, discounts to exercise facilities) *If yes, what are some examples?*	No: there are lots of partnerships, but none are wellness related Yes: volunteer activities; contribution to community events; wellness accounts; lunch and learns	

Questions and probes	Themes	Related concepts/comments
If there were to be a program in place specifically for women, do you feel that it would be successful? *Why/why not?*	Yes: • if it were done over the lunch period/extra room; having the fitness coordinator meet on a one-on-one basis with individuals; executing messages from the top-down • the things that are already in place are moderately successful	

Chapter 5- Conclusions

5.1. Overview of chapter

This chapter synthesizes the results and conclusions of Studies 1 and 2, and their limitations. Implications and recommendations for research, practice, and policy in workplace program development are presented.

5.2. Results and conclusions

Study 1

The purpose of Study 1 was to determine which social-cognitive theories (e.g., TTM, PMT, TPB, and SCT) and related constructs are most salient for explaining physical activity intentions and behaviour among employed women *with* children and *without* children. Overall, the results indicated that the variance explained (R^2) between both sub-groups of women was similar (1% to 12% difference) across the social-cognitive theories tested: 1) the TTM ranged from 16% to 24% for women with children, and from 23% to 24% for women without children; 2) R^2 for PMT ranged from 23% to 45% for women with children, and 24% to 47% for women without children; 3) TPB ranged from 40% to 51% for women with children, and 34% to 57% for women without children; and 4), R^2 for SCT ranged from 27% to 36% for women with children, and 29% to 31% for women without children.

The findings from this study also provided evidence to suggest that researchers and practitioners should consider operationalizing *self-efficacy* and *intentions* when working with employed women with and without children for future interventions and

programs. Providing *social support, eliminating barriers,* and *promoting the benefits* of being physically active should also be taken in to consideration, particularly among women with children.

On the whole, this study did not conclude that one theory fits best among women with and without children. The results, however, offer a preliminary understanding towards which theory/constructs, in part or in combination, are most suitable among these sub-groups of women.

Study 2

Study 2 included two research questions. The first question set out to determine whether employed women's multiple roles and responsibilities are associated with physical activity behaviour, and if so, how is this association similar or dissimilar between employed women *with* children and *without* children. The second research question aimed to identify environmental characteristics (e.g., physical, social, organizational, community, policy) that are salient to accommodate workplace physical activity programs for women. The main findings from the first study question indicated that the barriers employed women face due to their multiple roles and responsibilities are associated with their physical activity behaviours, and can have implications for program planning within the workplace. *Lack of time* due to work, family, or other obligations was the main barrier to participating in physical activity for those with and without children and dictated the amount of activity achieved. *Increased family obligations* for women with children were the main differences between the groups of participants. Other common barriers included lack of motivation, coping with an injury or disease, lack of/or

inadequate resources (e.g., exercise facilities, financial status, upper management support), and inadequate flex-time at work to exercise.

The main results based on the second study question found that pertinent socio-environmental characteristics to implement and maintain a workplace physical activity program included: establishing support from both employers and employees, targeting programs to employees needs, generating workplace health and wellness as a cultural norm, and increasing the resources to implement further programming strategies (e.g., access to fitness facilities, increased economic incentives such as subsidized fitness centers/equipment and daycare).

Overall this study demonstrated that workplace physical activity programs should extend beyond offering fitness classes and community subsidies to fitness facilities, and consider supporting physical activity as a cultural norm. Future physical activity programming goals for employed women should also be sensitive to demographic characteristics and the social-environment both at and outside the workplace.

In summary, both Study 1 and 2 provide a rich context to better understand workplace physical activity programming among employed women. Although, research on this population is still limited, these investigations have provided results related to individual lifestyle change and socio-environmental issues while accounting for demographic and social role factors. While Study 1 focused on psycho-social factors, Study 2 contextualizes these individual factors within a socio-environmental framework. For example, Study 1 examined behavioural theory and its constructs among sub-samples of employed women on the premise that previous research has indicated an association between women's multiple social roles and physical activity behaviours. Study 2,

qualitatively confirmed this association while also examining the social rationales for the reported relationships, which was a shortcoming of Study 1. The psychosocial overlap between both studies strengthened the validity of the relationships demonstrated between women with and without children. In both studies, barriers (cons), facilitators (pros), and social support were significant factors for explaining physical activity behaviours for both groups of women. It was interesting, however, to discover that the physical environment was not significant in Study 1, but was a prevalent theme in Study 2. While further research is required in this area, one explanation could be that the qualitative nature of Study 2 stimulated discussion surrounding the physical environment where it may have been statistically overpowered by other variables in Study 1. Moreover, the confidence (e.g., self-efficacy) and intentions of performing physical activity found as most significant for both groups of women in Study 1, can be contextualized by women in Study 2 describing competing demands for time, feelings of stress, tiredness and lack of motivation as substantial barriers that may hinder their assurance and desires to be active. Finally, the blended approach from both studies allowed for the magnitude of women's physical activity beliefs in Study 1 to be explored within the content parameters of Study 2.

5.3. Limitations

Study 1

Study 1 relied on self-report data and potential biases inherent in self-report data (e.g., over-reporting physical activity behaviour) may not be representative of the total female population under study. Further, not all theories/models were examined in their entirety (e.g., TTM and SCT) and of the same empirical design (e.g., cross-sectional

versus longitudinal), which limits theory comparability. Also, physical activity over-reporting by the participants may have occurred with the stage of change measure since physical activities of moderate intensity may have been more difficult to recall in comparison to vigorous activities. Future research should aim to standardize this measure as it can be a useful strategy to capturing differences among women and their readiness to adopt behaviour change. In addition, the lack of research among employed women in the physical activity and workplace area limits the comparability of this study's results to previous works. Most research has been conducted on correlates of physical activity among women and very few have empirically examined the predictability of particular behavioural theories with this population, specifically among employed women including the demographic differences among them. Finally, while the use of theory has proven to be of benefit to increasing physical activity, most often, studies have generally been found to explain only a small percentage of the variance in physical activity levels. This may be due to the full range of the participants' social context not being captured by the measured self-report data. Aspects of the physical environment in influencing women's readiness for behaviour change is an area that has received less attention and should be considered for future research investigations.

Study 2

The physical activity levels of participants in Study 2 were atypical of the general female population. Most of the women were likely meeting/close to meeting public health guidelines when both LTPA and PADL were identified. Participants self-selecting themselves in an area that is already of interest (e.g., physical activity) should also be

accounted for. Furthermore, this study was conducted primarily with Caucasian employees in large corporate settings and the degree to which the issues were addressed may not be entirely generalizable to culturally diverse groups of employed women and those in non-traditional employee settings (e.g., contract positions), blue-collar worksites, and/or small organizations.

5.4. Implications and recommendations for workplace program development

The need for physical activity interventions and programs specifically designed for women in the workplace necessitates appropriate and specific recommendations that provide directions towards workplace physical activity programming among women. These recommendations should guide health promotion practice among managers and practitioners, policy-makers, and researchers within the workplace and physical activity realms of science. It is anticipated the issues addressed within both studies of this thesis will indicate the importance of the matters at hand and inspire further research, interventions, and programs for women as a group, particularly those in the workforce. It is hoped that this research along with future work can facilitate a sustained physical activity program that can increase and accommodate for employed women's physical activity patterns, and increase women's overall well-being.

Based on the work conducted for this thesis, the following are a set of recommendations to be considered for future research, practice, and policy in workplace physical activity program agendas:

1. Apply behavioural theory to help direct and evaluate behaviour change. While there are several potential theories (e.g., TTM, PMT, TPB, SCT), operationalizing intentions, self-efficacy, social support, pros, and cons have been found as the constructs most predictive of behaviour among employed women;
2. Interventions should further test the reliability of the stage measure for LTPA and PADL among women;
3. Interventions and/or programs should promote both LTPA and PADL among women while providing clear definitions of both types of activity;
4. Interventions and/or programs should be tailored to the needs and interests of employed women and consider demographic and social role differences;
5. Additional research should focus on role overload and role balance issues among employed women with respect to their influences on physical activity behaviour;
6. Prior to implementing interventions and/or programs, it is essential to determine what 'health' means to the organization, and the extent to which physical activity and women's needs and interests are a priority for that organization;
7. Workplace physical activity as a cultural norm should be promoted (e.g., advocating walking groups during lunch hours, taking the stairs rather than the elevators);
8. Interventions and/or programs should elicit support from all levels of the organization including employees and employers;

9. Decrease or eliminate barriers by building gender sensitive policies, specifically ones that are family oriented (e.g., incorporating flex-time);
10. Programmers should consider gender specific resources to help implement and maintain physical activity through the use of economic incentives (e.g., subsidizing childcare);
11. Further physical activity research should focus on employed minority women, women with differing employment statuses (e.g., part-time, contract, full-time) and those who are employed in small or non-traditional workplaces;
12. Interventions should examine the mediating effects of the physical environment and its influences on employed women's physical activity behaviour;
13. Further work should focus on the influences of employee sex-role stereotyping on physical activity behaviour.

Appendix I: Extended methods

The purpose of this Appendix is to provide further details of the methods pertaining to Study 1 (Chapter 3) and Study 2 (Chapter 4). Specifically, information regarding data diagnostic procedures and analysis are discussed for Study 1. Data collection and ethical practices are detailed with respect to Study 2.

I.1. Study 1: Data Screening and Analysis

Data Screening

Screening for outliers and missing data followed procedures as outlined by Tabachnick & Fidell (2001)[1] (Table I.1.). Outliers identified (e.g., cases with standardized scores above +/- 3.29) were treated as missing cases. Approximately 30% of all cases of women had missing data. Composite scores for all psychosocial scales were then calculated (i.e., mean of self-efficacy, pros, cons, injunctive norm, and attitude). A composite score for each participant was calculated if they completed more than 66% of the variables for that construct.[2] The skewness and kurtosis values for the variables were assessed across all three time periods to determine normality of the variables. These values demonstrated ranges close to and between + and – 1, with the exception of response efficacy (e.g., skewness ranged from –1.51 to 2.58; kurtosis ranged from –1.23 to 9.36). Regression scatter plots of the independent variables (e.g., constructs of each theory) versus the dependent variables (i.e., intentions, stage of change, EE measure) represented homoscedasticity (e.g., the degree

[1] Tabachnick & Fidell. (2001). *Using Multivariate Statistics*. (4th Ed).Needham Heights, MA: Allyn & Bacon.
[2] Plotnikoff, R. (1994). Doctorship Thesis, University of Newcastle

to which the variables hold well together) and linearity of the variables, therefore, transformation of the variables was not deemed necessary.

Table I.1. Checklist for screening data

1. Inspect univariate descriptive statistics for accuracy of input
   a) out-of-range values
   b) plausible means and standard deviations
   c) univariate outliers
2. Evaluate amount and distribution of missing data; deal with problem
3. Check pairwise plots for nonlinearity and heteroscedasticity
4. Identify and deal with non normal variables
   a) check skewness and kurtosis, probability plots
   b) transform variables (if desirable)
   c) check results of transformation
5. Identify and deal with multivariate outliers
   a) identify and deal with multivariate outliers
   b) description of multivariate outliers
6. Evaluate variables for multicollinearity and singularity

Furthermore, collinearity tests conducted with each regression analysis indicated tolerance values approximately between 1.0 and 0.75 (e.g., acceptable values are >.20) and variance inflation factors (VIF) around 1.0 (e.g., values closest to 1 are acceptable) indicating that the independent variables were not highly correlated among themselves. Also, the Durbin-Watson statistic (e.g., tests for autocorrelation among independent variables) were all within the acceptable range of 1.50 and 2.50. Therefore, issues of invalid results through multicollinearity of the variables were not present. Bivariate correlations (Pearson's r) were also computed between each of the dependent measures and the constructs of each of the theories. These results for the most part demonstrated moderate correlations and values less than 0.70, which also eliminated mulitcollinearity possibilities (Table I-2 and Table I-3).

Table I-2 Pearson correlations of T1-2 and T2-3 multiple regression analysis among women *with* and *without* children[1,2,3]

	XIN	XEE	Pros	Cons	SE	SEV	VUL	Fear	RE	IN	YStage	YEE	YIN	XPros	XCons	XSE	XSEV	XVUL	Xfear	XRE
XIN	1	.482**	.236**	-.279**	.456**	.103	.158**	.204**	.164**	.566**	.495**	.309**	.621**	.498**	-.488**	.721**	.187**	.063	.055	.109
	1	*.511***	*.320***	*-.317***	*.556***	*.105***	*.107***	*.102***	*.186***	*.621***	*.501***	*.336***	*.657***	*.470***	*-.485***	*.725***	*.188***	*.212***	*.122***	*.244***
XEE	.482**	1	.162**	-.262**	.457**	.095	.051	.144*	.152*	.471**	.402**	.320**	.411**	.210**	-.305**	.443**	.092	.021	.110	-.048
	*.511***	*1*	*.210***	*-.219***	*.489***	*.058*	*.049*	*.039*	*.125***	*.451***	*.385***	*.477***	*.461***	*.209***	*-.288***	*.529***	*.136***	*.100***	*.013*	*.097***
Pros	.236**	.162**	1	-.171**	.261**	.109	.226**	.190**	.300**	.388**	.073	.045	.180**	.510**	-.159**	.240**	.113	.174**	.162**	.164**
	*.320***	*.210***	*1*	*-.160***	*.303***	*.109***	*.271***	*.250***	*.378***	*.421***	*.237***	*.153***	*.324***	*.563***	*-.168***	*.297***	*.096***	*.263***	*.246***	*.233***
Cons	-.279**	-.262**	-.171**	1	-.435**	-.013	.073	.006	-.157**	-.461**	-.228**	-.166**	-.310**	-.079	.533**	-.293**	.016	-.011	-.002	-.061
	*-.317***	*-.219***	*-.160***	*1*	*-.477***	*-.024*	*.005*	*.053*	*-.126***	*-.460***	*-.232***	*-.193***	*-.318***	*-.134***	*.563***	*-.406***	*-.023*	*.029*	*.020*	*-.084**
SE	.456**	.457**	.261**	-.435**	1	.159**	.035	.144*	.205**	.660**	.378**	.267**	.469**	.236**	-.387**	.563**	.131*	.002	.030	.067
	*.556***	*.489***	*.303***	*-.477***	*1*	*.095***	*.051*	*.078**	*.128***	*.677***	*.436***	*.332***	*.546***	*.268***	*-.414***	*.728***	*.116***	*.080**	*.067**	*.156***
SEV	.103	.095	.109	-.013	.159**	1	.304**	.387**	.121*	.189**	.195**	.070	.046	.111	-.101	.157**	.206**	.199**	.204**	.146*
	*.105***	*.058*	*.109***	*-.024*	*.095***	*1*	*.252***	*.352***	*.094***	*.094***	*.136***	*.040*	*.140***	*.141***	*.001*	*.062*	*.194***	*.180***	*.158***	*.158***
VUL	.158**	.051	.226**	.073	.035	.304**	1	.594**	.251**	.040	.127*	.051	.126*	.217**	-.077	.123*	.211**	.336**	.207**	.144*
	*.107***	*.049*	*.271***	*.005*	*.051*	*.252***	*1*	*.429***	*.363***	*.136***	*.062*	*.032*	*.088***	*.264***	*-.051*	*.075**	*.134***	*.352***	*.285***	*.208***
Fear	.204**	.144*	.190**	.006	.144*	.387**	.594**	1	.265**	.165**	.218**	.126*	.204**	.276**	-.097	.171**	.240**	.295**	.288**	.170**
	*.102***	*.039*	*.250***	*.053*	*.078**	*.352***	*.429***	*1*	*.364***	*.099***	*.119***	*.016*	*.106***	*.239***	*-.012*	*.051*	*.135***	*.263***	*.298***	*.228***
RE	.164**	.152*	.300**	-.157**	.205**	.121*	.251**	.265**	1	.192**	.118	.089	.160**	.234**	-.109	.155**	-.035	.130*	.136*	.308**
	*.186***	*.125***	*.378***	*-.126***	*.128***	*.094***	*.363***	*.364***	*1*	*.197***	*.197***	*.064*	*.210***	*.326***	*-.146***	*.166***	*.052*	*.260***	*.288***	*.393***
IN	.566**	.471**	.388**	-.461**	.660**	.189**	.040	.165**	.192**	1	.448**	.308**	.575**	.311**	-.375**	.461**	.161**	.061	.100	.087
	*.621***	*.451***	*.421***	*-.460***	*.677***	*.094***	*.136***	*.099***	*.197***	*1*	*.443***	*.307***	*.595***	*.312***	*-.353***	*.575***	*.121***	*.141***	*.097***	*.190***
YStage	.495**	.402**	.073	-.228**	.378**	.195**	.127*	.218**	.118	.448**	1	.322**	.702**	.226**	-.365**	.397**	.150*	.078	.165**	.118*
	*.501***	*.385***	*.237***	*-.232***	*.436***	*.136***	*.062*	*.119***	*.197***	*.443***	*1*	*.300***	*.661***	*.251***	*-.292***	*.466***	*.142***	*.116***	*.144***	*.146***
YEE	.309**	.320**	.045	-.166**	.267**	.070	.051	.126*	.089	.308**	.322**	1	.408**	.179**	-.175**	.214**	.017	.009	.018	.039
	*.336***	*.477***	*.153***	*-.193***	*.332***	*.040*	*.032*	*.016*	*.064*	*.307***	*.300***	*1*	*.368***	*.100***	*-.237***	*.356***	*.077**	*.018*	*.000*	*.011*
YIN	.621**	.411**	.180**	-.310**	.469**	.046	.126*	.204**	.160**	.575**	.702**	.408**	1	.346**	-.373**	.497**	.144*	.003	.116*	.077
	*.657***	*.461***	*.324***	*-.318***	*.546***	*.140***	*.088***	*.106***	*.210***	*.595***	*.661***	*.368***	*1*	*.355***	*-.368***	*.609***	*.133***	*.139***	*.086**	*.176***

	XIN	XEE	Pros	Cons	SE	SEV	VUL	Fear	RE	IN	YStage	YEE	YIN	XPros	XCons	XSE	XSEV	XVUL	Xfear	XRE
XPros	.498**	.210**	.510**	-.079	.236**	.111	.217**	.276**	.234**	.311**	.226**	.179**	.346**	1	-.245**	.428**	.134*	.184**	.187**	.230**
	*.470***	*.209***	*.563***	*-.134***	*.268***	*.141***	*.264***	*.239***	*.326***	*.312***	*.251***	*.100***	*.355***	*1*	*-.222***	*.353***	*.157***	*.330***	*.230***	*.381***
XCons	-.488**	-.305**	-.159**	.533**	-.387**	-.101	-.077	-.097	-.109	-.375**	-.365**	-.175**	-.373**	-.245**	1	-.536**	-.103	-.089	-.082	-.135*
	*-.485***	*-.288***	*-.168***	*.563***	*-.414***	*.001*	*-.051*	*-.012*	*-.146***	*-.353***	*-.292***	*-.237***	*-.368***	*-.222***	*1*	*-.489***	*-.079**	*-.026*	*-.006*	*-.169***
XSE	.721**	.443**	.240**	-.293**	.563**	.157**	.123*	.171**	.155**	.461**	.397**	.214**	.497**	.428**	-.536**	1	.139*	.049	.091	.125*
	.725**	.529**	.297**	-.406**	.728**	.062	.075*	.051	.166**	.575**	.466**	.356**	.609**	.353**	-.489**	1	.153**	.166**	.121**	.237**
XSEV	.187**	.092	.113	.016	.131*	.206**	.211**	.240**	-.035	.161**	.150*	.017	.144*	.134*	-.103	.139*	1	.288**	.398**	.062
	*.188***	*.136***	*.096***	*-.023*	*.116***	*.194***	*.134***	*.135***	*.052*	*.121***	*.142***	*.077**	*.133***	*.157***	*-.079**	*.153***	*1*	*.263***	*.349***	*.104***
XVUL	.063	.021	.174**	-.011	.002	.199**	.336**	.295**	.130*	.061	.078	.009	.003	.184**	-.089	.049	.288**	1	.492**	.270**
	*.212***	*.100***	*.263***	*.029*	*.080**	*.180***	*.352***	*.263***	*.260***	*.141***	*.116***	*.018*	*.139***	*.330***	*-.026*	*.166***	*.263***	*1*	*.465***	*.287***
Xfear	.055	.110	.162**	-.002	.030	.204**	.207**	.288**	.136*	.100	.165**	.018	.116*	.187**	-.082	.091	.398**	.492**	1	.205**
	*.122***	*.013*	*.246***	*.020*	*.067**	*.158***	*.285***	*.298***	*.288***	*.097***	*.144***	*.000*	*.086**	*.230***	*-.006*	*.121***	*.349***	*.465***	*1*	*.288***
XRE	.109	-.048	.164**	-.061	.067	.146*	.144*	.170**	.308**	.087	.118*	.039	.077	.230**	-.135*	.125*	.062	.270**	.205**	1
	*.244***	*.097***	*.233***	*-.084**	*.156***	*.158***	*.208***	*.228***	*.393***	*.190***	*.146***	*.011*	*.176***	*.381***	*-.169***	*.237***	*.104***	*.287***	*.288***	*1*

Notes: [1] Values in italics represent women without children/ T1-2= Time 1 constructs predicting Time 2 behaviour; T2-3= Time 2 constructs predicting Time 3 behaviour

[2] All X prefixes indicate T2 constructs or behaviour; All Y prefixes indicate T3 behaviour

[3] IN= Intention/ EE= Energy Expenditure/ SE= Self-efficacy/ SEV= Severity/ VUL= Vulnerability/ RE= Response Efficacy

** Correlation is significant at the 0.01 level 2-tailed.

* Correlation is significant at the 0.05 level 2-tailed.

Table I-3 Pearson correlations of T3-3 multiple regression analysis among women *with* and *without* children[1,2]

	IN	Stage	EE	SS	INJ	ATT	SE	PE
IN	1	.702**	.408**	.359**	.189**	-.239**	.693**	.280**
	1	*.661***	*.368***	*.355***	*.185***	*-.276***	*.745***	*.421***
Stage	.702**	1	.322**	.245**	.127*	-.235**	.511**	.213**
	*.661***	*1*	*.300***	*.310***	*.181***	*-.244***	*.525***	*.303***
EE	.408**	.322**	1	.136*	.106	-.165**	.415**	.141*
	*.368***	*.300***	*1*	*.202***	*.085**	*-.183***	*.389***	*.238***
SS	.359**	.245**	.136*	1	.411**	-.037	.295**	.401**
	*.355***	*.310***	*.202***	*1*	*.395***	*-.078**	*.335***	*.457***
INJ	.189**	.127*	.106	.411**	1	.087	.145*	.173**
	*.185***	*.181***	*.085**	*.395***	*1*	*-.007*	*.187***	*.262***
ATT	-.239**	-.235**	-.165**	-.037	.087	1	-.230**	-.064
	*-.276***	*-.244***	*-.183***	*-.078**	*-.007*	*1*	*-.294***	*-.172***
SE	.693**	.511**	.415**	.295**	.145*	-.230**	1	.277**
	*.745***	*.525***	*.389***	*.335***	*.187***	*-.294***	*1*	*.434***
PE	.280**	.213**	.141*	.401**	.173**	-.064	.277**	1
	*.421***	*.303***	*.238***	*.457***	*.262***	*-.172***	*.434***	*1*

Notes: [1] Values in italics represent women without children/ T3-3= Time 3 constructs predicting Time 3 behaviour;
[2] IN= Intention/ EE= Energy Expenditure/ SS= Social Support/ INJ= Injunctive Norm/ ATT= Attitude/ SE= Self-efficacy/ PE= Physical Environment

** Correlation is significant at the 0.01 level 2-tailed.
* Correlation is significant at the 0.05 level 2-tailed.

Data Analysis

The key social cognitive theories/models analyzed include the Transtheoretical Model (TTM), Protection Motivation Theory (PMT), Theory of Planned Behaviour (TPB), and the Social Cognitive Theory (SCT) (Table I-4).

Table I-4: Representation of theories analyzed and key constructs measured

Theories/Models	*Key Constructs*
TTM	Pros
	Cons
	Self-efficacy
PMT	Severity
	Vulnerability
	Fear
	Response efficacy
	Self-efficacy
	Intentions
TPB	Social support
	Injunctive norm
	Attitude
	Self-efficacy
	Intentions
SCT	Physical Environment
	Social support
	Self-efficacy

The main analyses were conducted with stepwise multiple regressions. This type of test assesses the predictive relationship between one dependent variable and several independent variables by statistically eliminating the independent variables that are less correlated with the dependent variable. A backward deletion process was conducted where the equation starts out with all the independent variables entered and then deleted one at a time if they are not found significant to the regression. Although multiple regression tests are statistically robust, their results can be inflated by chance and the data

may not generalize well to the population (Tabachnick & Fidell, 2001). To minimize reporting results based on the chance of error, the assumption tests and correlations of each regression result were confirmed to determine the importance of the independent variables to the regression. Pairwise (e.g., omits cases that do not have data on the dependent variable used) and listwise deletion (e.g., omits cases which do not have data on any of the variables tested) was conducted with each regression. Due to the minimal differences between each of the results, pairwise data were reported on account of the larger N's in each analysis (large N's are desirable to increase the generalizabiltiy of the results to the population).

I.2. Study 2: Data Collection and Ethical Practices

General overview of data collection (phase I & II)

In order to gain entry and consent to recruit participants for Study 2, permission and support was first arranged between the researchers and the champions of each worksite (e.g., an individual who can motivate action through leadership, support, advocacy, and participation), recruited from a healthy eating and physical activity electronic messaging study (Plotnikoff et al., in press).[3] A letter requesting permission to conduct a follow-up study was mailed to each of the two workplaces (Appendix II.2.).

Once permission and support was obtained by the organization, recruitment letters were posted and internally e-mailed to everyone with information about the study via the champion of the organization. Two separate flyers were devised according to the

[3] Plotnikoff, R.C., Prodaniuk, T. R., Fein, A. J., & Milton, L. (in press). Development of an ecological assessment tool for a workplace physical activity program standard. *Health Promotion Practice.*

information group: primary (e.g., women employees) and secondary (e.g., senior personnel) (Appendix II.3 and II.4). The flyer for primary information providers included details and significance of the project and an invitation to participate in a focus group that would be dependent on meeting selection criteria (e.g., to participate in the study, potential primary respondents must be female and currently employed). Similarly, the flyer for the secondary information providers included details and significance of the project and an invitation to participate in a one-on-one interview if selection criteria are met (e.g., potential secondary respondents must hold a full time job status in upper management within the organization).

Upon acceptance of the invitation, confirmation through e-mail or phone was made to determine that participant criterion for selection was met. All primary information providers who indicated interest in the study were asked to complete a short demographic questionnaire to be filled in and sent back via e-mail to confirm their participation in the study (Appendix II.5). All confirmed participants were mailed an information letter indicating the purpose of the study, a brief description of what will be expected during the focus group/interview session, and confirmation of the time and place for the sessions (Appendix II.6 and II.7).

Ethical practices

The research for this thesis was approved by the University of Alberta Research Ethnics Committee (Appendix II.8). Further, the participants were asked to complete an informed consent form as per the guidelines specified by the committee (Appendix II.9). The informed consent was mailed to the participants at their workplace and were later

returned to the researcher in person or by mail prior to conducting the focus groups and interviews. All participants were assured confidentiality and anonymity throughout the study.

Appendix II: Study Instruments[1]

This section of the appendix outlines the instruments used in both Study 1 and 2. The self-report questionnaire from Study 1 is presented. Instruments from Study 2 include: organization recruitment letter, participant recruitment flyers, study information letters, ethics approval letter, consent form, demographic and evaluation questionnaires, and a representation of the scroll given to focus group participants.

II.1. Study 1: Questionnaire

Healthy Eating and Active Living Questionnaire

About This Study

This confidential questionnaire is about how people think and feel about healthy eating and physical activity. There are no right or wrong answers to any of these questions. **Read the questions carefully and answer each one according to what is true for you.**

[1] The WPAAT and its standard of best practices (administered to interview participants during Study 2) can be downloaded at: http://www.centre4activeliving.ca/research/2003workplace/WPFramework.pdf

How to Record Your Answers

For each question, please check the box which matches your answer. Please select only one answer.

Here is an example of a question answered by checking a box:

1. Do you do physical activity even when you feel tired?

☑ Yes ☐ No

Checking the "yes" box means that the above statement is true for you.

Here is an example of a question answered by selecting a number:

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
2. I enjoy swimming.	1	2	3	(4)	5

Selecting number 4 means that you agree that you enjoy swimming.

Faculty of Physical Education & Recreation
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University of Alberta

Centre for Health Promotion STUDIES

Physical Activity Section

Section A

1. For this question, we would like you to recall your average weekly participation in physical activity over the past month. Over the past month, how many times per week on average did you do the following kinds of physical activity during your free time?

When answering these questions please:

- Consider your average over the past month.
- Only count physical activity sessions that lasted 10 minutes or longer in duration.
- Do not count physical activity that was done as part of your employment or household chores.
- Note that the main difference between the three categories below is the intensity of the physical activity.
- Please write the average amount of times per week in the first column and the average length of time for each session in the second column.
- Do this for all three categories below, Strenuous, Moderate, and Mild.

	Times Per Week	**Average Time Per Session (minutes)**
A. Strenuous physical activity (heart beats rapidly, sweating) (e.g., running, jogging, hockey, soccer, squash, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling, vigorous aerobic dance classes, heavy weight training)		
B. Moderate physical activity (not exhausting, light perspiration) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)		
C. Mild physical activity (minimal effort, no perspiration) (e.g., easy walking, archery, fishing, bowling, lawn bowling, shuffleboard, horseshoes, golf, snowmobiling)		

2. How active are you at your workplace on most days? Select only one answer.

- ☐ Sedentary (mostly sitting or standing)
- ☐ Moderately active (walking, light lifting, packing, etc., some of the time)
- ☐ Active (walking, lifting/carrying, half of the time or more)
- ☐ Very active (walking more than half the time, lifting/carrying heavy objects, shoveling etc…)

For the remaining sections in this study we ask about your beliefs and behaviours on doing "regular physical activity."

"Regular physical activity" *is defined as doing activities such as brisk walking, recreation, and sporting activities (e.g., jogging, swimming, bicycling, skiing) all at a moderate intensity of a brisk walking pace (or faster). These free-time activities do not include household chores or physical labour on the job.*

For moderate activity to be regular, your activity must:

- **add up to a total of 30 minutes or more per day**
- **be done at least 4 days per week**

There are a number of ways that you could reach your 30 minute total. You could, for example:

- **take a half-hour brisk walk or bicycle ride**

  or

- **take three, 10-minute periods of activities; such as a brisk walk for 10 minutes, swimming for 10 minutes and climbing stairs for exercise for 10 minutes, all in the same day, but at different times.**

Section B

Please check the description that best describes your physical activity behaviour. Remember regular physical activity equals doing physical activity at least 4 days a week, for 30 minutes each day, at a moderate intensity of a brisk walking pace (or faster).

☐ I presently ***do not get*** regular physical activity and do not plan to do so in the next 6 months.

☐ I presently ***do not get*** regular physical activity, but I have been thinking about doing so within the next 6 months.

☐ I presently ***do not get*** regular physical activity, but I plan to in the next 30 days.

☐ I presently ***get*** regular physical activity, but I have only begun doing so within the past 6 months.

☐ I presently ***get*** regular physical activity and have been doing so for longer than 6 months.

Section C

Please check the description that best described your total physical activity behaviour that you get during your leisure-time, household chores, and worktime. Remember regular physical activity equals doing physical activity at least 4 days a week, for 30 minutes each day, at a moderate intensity of a brisk walking pace (or faster).

☐ I presently ***do not get*** regular physical activity and do not plan to do so in the next 6 months.

☐ I presently ***do not get*** regular physical activity, but I have been thinking about doing so within the next 6 months.

☐ I presently ***do not get*** regular physical activity, but I plan to in the next 30 days.

☐ I presently ***get*** regular physical activity, but I have only begun doing so within the past 6 months.

☐ I presently ***get*** regular physical activity and have been doing so for longer than 6 months.

Section D

The next questions ask how confident you are about doing regular physical activity in different circumstances. Please circle one response for each question.

In the next 3 months, I am confident that I can participate in regular physical activity:

	Not at all confident	*Not very confident*	*Moderately confident*	*Very confident*	*Extremely confident*
1. When I am a little tired.	1	2	3	4	5
2. When I am in a bad mood or feeling depressed	1	2	3	4	5
3. When I have to do it by myself.	1	2	3	4	5
4. When I can't notice any improvements in my fitness.	1	2	3	4	5
5. When I have many other demands on my time.	1	2	3	4	5
6. When I feel a little stiff or sore.	1	2	3	4	5
7. When the weather is bad.	1	2	3	4	5

8. On a scale of 0% to 100%, how likely is it that you **will** get regular physical activity within the next 3 months?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Section E

To what extent will the following ideas influence your decision to do regular physical activity over the next 3 months?

*Remember, we are not asking you how much you agree or disagree with these statements, but rather how much each may influence your decision to do regular physical activity over the **next 3 months**.*

	Over the next 3 months:	***Not at all***	***A little***	***Some-what***	***Quite a lot***	***Very much***
1.	Physical activity would help me reduce tension or manage stress.	1	2	3	4	5
2.	I would feel more confident about my health by getting regular physical activity.	1	2	3	4	5
3.	I would sleep better.	1	2	3	4	5
4.	Physical activity would take too much of my time.	1	2	3	4	5
5.	I'd be too tired to get physical activity because of my other daily responsibilities.	1	2	3	4	5
6.	Physical activity would help me have a more positive outlook.	1	2	3	4	5
7.	Physical activity would help me control my weight.	1	2	3	4	5
8.	I'd worry about looking awkward if others saw me being physically active.	1	2	3	4	5
9.	Participating in physical activity would cost too much money.	1	2	3	4	5

Over the next 3 months:	*Not at all*	*A little*	*Some-what*	*Quite a lot*	*Very much*
10. Regular physical activity would cause me injury.	1	2	3	4	5

Section F

The following statements reflect ways that you might feel about physical activity. Please tell us how much you agree that each statement represents your thoughts about doing regular physical activity over the next 3 months.

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
1. For me, being physically **inactive** would be a very bad thing.	1	2	3	4	5
2. If I am **inactive**, I would be at risk for serious health problems.	1	2	3	4	5
3. For me, being physically **inactive** would frighten me because of the possibility of developing serious health problems.	1	2	3	4	5
4. Regular physical activity is important for disease prevention (e.g., heart disease, diabetes)	1	2	3	4	5

The following are ways that you might feel about physical activity. Please tell us how much you agree that each statement represents <u>your</u> thoughts about doing regular physical activity over the next 3 months.

	Not at all	*A little*	*Somewhat*	*Quite a lot*	*Very much*
1. It would be **demanding** for me to do physical activity over the next 3 months.	1	2	3	4	5
2. It would be **gratifying** for me to do physical activity over the next 3 months.	1	2	3	4	5
3. It would be **boring** for me to do physical activity over the next 3 months.	1	2	3	4	5
4. It would be **fun** for me to do physical activity over the next 3 months.	1	2	3	4	5

Please tell us how much you agree or disagree with each statement.

Over the next 3 months:	*Strongly disagree*	*Disagree*	*Neither agree or disagree*	*Agree*	*Strongly agree*
1 Most people in my social network want me to do regular physical activity.	1	2	3	4	5
2 My doctor or health care provider wants me to participate in regular physical activity.	1	2	3	4	5

Over the next 3 months:	***Strongly disagree***	***Disagree***	***Neither agree or disagree***	***Agree***	***Strongly agree***
3. I have easy access to a place where I can get physical activity.	1	2	3	4	5
4. I receive support for participating in regular physical activity from the people closest to me.	1	2	3	4	5

Section G

The final section of the questionnaire is needed to help understand personal characteristics of the participants. All information received is held in strict confidence and its presentation to the public will be group data only.

1. Weight Information:

   Weight in pounds _____ or in kilograms _____

2. Ethnic Origin:

   Canadian _____ European _____

   Arab _____ Aboriginal _____

   Asian _____ Latin, South American _____

   African _____ Other (please specify) _____

3. Marital Status:

   Never Married _____ Married _____

   Common Law _____ Widowed _____

   Separated or divorced _____

4. Education:

Some Grade School _____	Completed College / University _____
Some High School _____	Some Graduate School _____
Completed High School _____	Completed Graduate School _____
Some University / College _____	

5. Employment Status:

Full Time Paid _____ Part-Time Paid _____ Casual _____

6. Are you responsible for the care of children under 13 years old who live with you?

☐ Yes → How many? _____

☐ No

7. Do you currently smoke cigarettes?

☐ Yes → How many cigarettes do you usually smoke a day? _____

☐ No → Have you ever smoked cigarettes? ☐ Yes ☐ No

8. Has a close blood relative (e.g., a parent, brother or sister) ever had heart disease (e.g., heart attack, stroke, and/or angina) before the age of 60?

☐ Yes ☐ No

9. Has a doctor or nurse ever told you that you have had the following: (*please check all that apply)*

a.	Angina	☐ Yes	☐ No	e.	High blood cholesterol	☐ Yes	☐ No
b.	Heart Attack	☐ Yes	☐ No	f.	High blood pressure	☐ Yes	☐ No
c.	Stroke	☐ Yes	☐ No	g.	Diabetes	☐ Yes	☐ No
d.	Cancer	☐ Yes	☐ No				

Age _____

Male _____ Female _____

Thank you for your participation in this research study.

II.5. Study 2: Focus Group Demographic Questionnaire

Marital Status: Never Married _____ Married _____
Common Law _____ Widowed _____
Separated or divorced _____

Employment Status:

Full Time Paid _____ Part-Time Paid _____ Casual _____

Are you responsible for the care of children under 13 years old who live with you?

☐ Yes → How many? _____
☐ No

Age _____

II.10. Study 2: Evaluation Questionnaire

Please circle which best describes your feelings:

- Did you enjoy participating in the interview session?

Not at all	A little	Somewhat	Quite a lot	Very much
1	2	3	4	5

- Did you find the session helpful to stimulate discussion with others at your workplace?

Not at all	A little	Somewhat	Quite a lot	Very much
1	2	3	4	5

- Did the session adequately address the challenges of becoming physically active within the workplace?

Not at all	A little	Somewhat	Quite a lot	Very much
1	2	3	4	5

- Would the information be helpful to other people in the same occupation as you?

Not at all	A little	Somewhat	Quite a lot	Very much
1	2	3	4	5

- Did the session adequately reflect your experiences as a woman?

Not at all	A little	Somewhat	Quite a lot	Very much
1	2	3	4	5

- What issue(s) would you have liked to address during the session or would have liked to address further?

Can we contact you again if we have any questions regarding the information you have shared with us?

No Yes If Yes → Name: _____ Phone #: _____
E-mail: _____

II.11. Study 2: Focus Group Participant Scroll

"Because of working women like yourself, the world is a wonderful place. Every day presents a new opportunity to make a contribution that counts, whether it be at home or out in the workforce."

Excerpt taken from 'Chicken Soup for the Working Woman's Soul' (2003). By: Jack Canfield, Mark Victor Hansen, Patty Aubery, Chrissy & Mark Donnelly. Florida, U.S.A: Health Communications Inc.

The history of all times, and of today, especially, teaches that...women will be forgotten if they forget to think about themselves.

Louise Otto