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THE DEVELOPMENT OF A RESEARCH INSTRUMENT TO MEASURE HEALTH PROFESSIONALS' ATTITUDES TO BREASTFEEDING

BY

BEVERLY JEANNE SCHUMACHER CHABA

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

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submitted by BEVERLY JEANNE SCHUMACHER CHABA

in partial fulfilment of the requirement for the degree of Master of Science in Nutrition

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Date: 24 September 1985

ABSTRACT

Much emphasis has been placed on the fundamental role that health professionals' attitudes play in encouraging breastfeeding. However, the construct attitude, does not appear to be well formulated or measured as applied to breastfeeding research. The major objectives of this investigation were to develop and test the utility of an instrument which could be used to measure health professionals' attitudes toward breastfeeding. Fishbein and Ajzen's conceptual model of beliefs, attitudes, intentions and behaviors provided the framework for the instrument design. Maternity ward nurses from a metropolitan hospital, two classes of student nurses and randomly sampled members of A.R.D.A and O.N.E were surveyed. Fifty-four multiple indicators of five hypothesized beliefs health professionals might hold about breastfeeding were analyzed using factor analysis. Three beliefs were found to be important, they were labeled: "nutritional superiority", "moral responsibility" and "public acceptability". An overall "attitude" score was obtained by averaging the scores on the three beliefs. The instrument was tested to determine how well it distinguished between different groups of respondents. The statistical analyses indicated that the instrument was reliable and valid.

ACKNOWLEDGEMENTS

My sincere appreciation is extended to many individuals who offered their encouragement and expertise during the completion of this investigation. I am especially grateful to Paul Fieldhouse, as Chairman of my thesis, who patiently stood back and allowed me room to grow personally and professionally. Paul fostered an open-mindedness and awareness which enhanced my graduate studies.

One other individual has been especially considerate in providing assistance and guidance and I give a special thank you to Harvey Krahn.

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I would also like to thank the individual(s) who introduced me to a new dimension of humor. In those last frantic hours

before the "deadline" someone sent an anonymous care-package equipped with everything a student might need: flowers, card, a candle which burns at both ends, a stick of anti-perspirant, chocolate-covered coffee beans, balloons, gum for the non-smoker and an assortment of other necessities!

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CHAPTER I

INTRODUCTION

The nutritional composition of human milk includes a wide variety of constituents. Although dramatic advances in laboratory techniques have been made in recent years, complete data on all the constituents, and their importance, in human milk is still incomplete (Lawrence 1980). What is clear however, is that breastfeeding is a nutritionally important behavior which health professionals, including nutritionists, generally agree should be encouraged.

During the International Year of the Child (1979), the Canadian and the American Pediatric Societies chose to promote breastfeeding as their major cause. Both organizations officially declared breastfeeding to be the superior method of infant feeding on the basis of a number of different factors. Despite enthusiastic endorsement of breastfeeding by various medical and non-medical (International Childbirth Education Association, La Leche League International) societies, and despite the known benefits of breastfeeding for the infant-mother dyad, many mothers still choose to bottlefeed, and amongst those that

do breastfeed, many do so for less than the recommended four to six months (Fieldhouse 1984; McNally et al. 1985; Yeung et al. 1981).

In Canada, the need to encourage breastfeeding has been established as a health priority (Myres 1981), and a national program to increase awareness of the value of breastfeeding was initiated in 1979. The first phase of the program involved the development and distribution of a breastfeeding awareness kit to various groups of health professionals (Myres et al. 1981). In 1981, together with 117 other nations, Canada voted in support of an international code of marketing of breastmilk substitutes. The code emphasized the need for national governments to promote breastfeeding. It also emphasized the fundamental role that hospitals and health professionals play in encouraging breastfeeding. In the spring of 1985, Health and Welfare Canada distributed a new resource and awareness kit to maternity hospitals. Again, the thrust of the kit was to encourage health professionals to promote breastfeeding (Health and Welfare Canada 1985).

A survey of current literature suggests that the decrease of successful breastfeeding has been linked to iatrogenic causes. Hospital routines which emphasize order and cleanliness and place a priority on schedules interfere with lactation and the natural process of infant suckling

(Thomson et al. 1979). Research has shown that health professionals have failed to provide information about and support for breastfeeding and many of them lack the knowledge needed to adequately assist with breastfeeding problems (Applebaum 1975; Auerbach 1976; Blachman 1981; Ellis 1981; Hall 1978; Kemberling 1979; Ladas 1970). Health and Welfare Canada recognized the important influence health professionals could have on breastfeeding success:

> The knowledge, skills and attitudes of the health professional are, perhaps, some of the most influential factors in determining the choice and success of breastfeeding. (Myres 1981)

Indeed, the American and Canadian Pediatric Societies both recommended that:

> Attitudes and practices in prenatal clinics, obstetrics wards and newborn nurseries should be changed to permit a climate which favors breastfeeding. (Canadian Pediatric Society, 1978)

This is a view with which many authors concur. Consequently, a number of investigations have broached the topic.

However, research literature on breastfeeding attitudes is, for the most part, inadequate. Considering that the term "attitude" is a widely-used term, it is characterized by "an embarrassing degree of ambiguity and confusion" (Fishbein and Ajzen, 1975). The concept of attitude is poorly comprehended. One of the major reasons for this is the term

itself lacks a commonly accepted definition; consequently an assortment of definitions exist along with an equally diverse collection of measurement techniques. A review of research papers dealing with attitudes toward breastfeeding failed to reveal an objective instrument which could be used to quantify attitudes toward breastfeeding. Those papers which have reported on attitudes frequently used inadequate or non-comparable measurement techniques. Accordingly, health professionals' attitudes to breastfeeding are not clearly known.

The behaviors of health professionals appears logically to be a key point for intervention to promote breastfeeding. And, the attitudinal perspective seems a logical device for explaining and predicting behavior as well as for identifying groups where education would be needed. However, in the absence of valid measures of health professionals' attitudes to breastfeeding, it is apparent that the recommendations cited above are based more on intuition than properly gathered data. In short, objective measures of health professionals' attitudes toward breastfeeding are not available, consequently the relative importance of health professionals' attitudes to the incidence of breastfeeding has not been adequately addressed.

Of primary concern is an adequate conceptual definition of attitude. If the variable to be changed is poorly

understood, it is reasonable to assume that attempts to bring about change are likely to be inconsistent and, at best, will meet with minimum success. Fishbein and Ajzen (1975) have suggested that a conceptual definition of attitude should provide an adequate basis for developing measurement procedures. If programs with objectives to improve health professionals' attitudes to breastfeeding are to be successful, they need solid empirical grounds justifying implementation, design and evaluation.

The overall purpose of this investigation was to develop an instrument for measuring attitudes toward breastfeeding which could be used to gain a better understanding of health professionals' attitudes to breastfeeding. A secondary purpose of the investigation was to use this instrument to begin to look at differences between groups (such as, those who are student nurses and those who are employed nurses). The specific research objectives were as follows:

1. To develop a reliable and valid instrument to measure health professionals' attitudes toward breastfeeding.
2. To obtain data on underlying dimensions of attitudes toward breastfeeding.
3. To describe the views of various health professional groups and individuals regarding breastfeeding.
4. To examine the possibility of linking specific personal and environmental variables to breastfeeding attitudes.

The Need For The Study

The rational underlying this investigation is that there is a need to develop a reliable and valid instrument to measure health professionals' attitudes toward breastfeeding. There has been an expressed need to encourage more positive breastfeeding attitudes amongst those working in the health field. But, the research literature on breastfeeding attitudes is, for the most part, vague and lacking a definite protocol with which to quantify attitudes toward breastfeeding. Before significant effort is devoted to modifying health professionals' attitudes toward breastfeeding it is necessary to arrive at a reliable and valid evaluation of the construct attitude. This would then provide a firm basis for developing and evaluating programs.

Overview Of The Thesis

Chapter II presents a review of the evidence drawn from a variety of disciplines supporting the apparent superiority of breastfeeding over bottlefeeding. The conceptual model used in this investigation of breastfeeding attitudes and a review of the literature relevant to health professionals' breastfeeding attitudes is presented in Chapter III. Chapter IV is a description of the development of the research instrument. The specific methodology and data analyses are

presented in Chapter V and Chapter VI is devoted to the results obtained and discussion of these results. The final chapter contains a summary of the investigation and recommendations arising from it.

CHAPTER II

UNIQUE QUALITIES OF BREASTFEEDING

Introduction

Despite increasing scientific evidence resulting in a general recognition of breastfeeding as the superior method of infant feeding, there still appears to be some indication that health care professionals as well as lay persons believe breastfeeding is not inherently superior to bottlefeeding and that either method is equally acceptable. Chapter II is devoted to answering the question, 'is breast best?'. A brief overview of the unique qualities of breastfeeding will be presented.

The most obvious unique quality of breastfeeding is the nutrient composition of breastmilk. Species-specific, it has a unique biochemical composition adapted to the physiological growth and developmental needs of the human infant. However, there are several other areas that must also be considered: immunological, psychological, contraceptive, economical and anti-allergic significance. Mothers also benefit. Another quality of breastmilk is its

changing composition. Changes in composition occur during the feed, during the day and between breasts. The most evident change however, occurs in the first few days postpartum. Colostrum is the first milk produced and it's qualities warrant a separate section; it will be discussed first.

Colostrum

Initially, mothers produce colostrum, which is a thick, yellowish liquid. It is also termed immature milk. Colostrum production continues for two to ten days postpartum after which the production of mature milk begins (Psiaki, Olson 1977). Although the term "immature" implies that colostrum is incomplete, actually it is more a case of it being different. The nutrient composition of colostrum differs from that of mature milk in that it contains more protein, minerals and vitamin A, but less fat and carbohydrate (Table 2.1). The levels of anti-infective components in colostrum are generally much higher than the concentrations in mature milk. These immunological benefits are virtually non-existant in cow's milk or commercial formulas. These differences facilitate the transition from fetal to postnatal life.

TABLE 2.1: COMPARATIVE COMPOSITION OF COLOSTRUM, MILKS AND PROPRIETARY FORMULA

NUTRIENT (per 100ml)	COLOSTRUM (1-5 DAYS)	MILK HUMAN	MILK COW	PROPRIETARY FORMULA
ENERGY (kcal)	60	75	66	67
PROTEIN (g)	2.7-3.2	0.9-1.1	3.2-3.5	1.5-3.4
CASEIN (% total protein)	+	40	82	
WHEY (% total protein)	+	60	18	
FAT (g total)	2.5-2.9	4.0-4.5	3.5-3.7	3.4-3.7
SATURATED (g)	+	2.2	2.2	1.2-1.6
UNSATURATED (g)	+	2.3	1.3	2.0-2.5
CHOLESTEROL (mg)	+	7-47	10-35	1.4-3.3
CARBOHYDRATE (g)	+	6.8	4.9	5.2-7.7
LACTOSE (g)	5.0-5.7	6.8-7.2	4.9-5.0	7.0-7.3
MINERALS				
CALCIUM (mg)	27-31	29-33	117-122	44-80
PHOSPHORUS (mg)	14-15	14-15	92-93	33-53
SODIUM (mg)	47	15-16	50	27-34
POTASSIUM (mg)	74	51	137	56-91
IRON (mg)	0.09-0.1	0.03-0.05	.05	trace-1.3
VITAMINS				
A (IU)	160-500	200	140	170-264
THIAMINE (mg)	0.01-0.35	0.01-0.2	0.03-0.04	0.05-0.06
RIBOFLAVIN (mg)	0.01-0.02	0.03-0.04	0.01-0.02	0.05-0.10
NIACIN ((mg)	.075	0.015-0.017	0.09-0.10	0.6-1.0
FOLIC ACID (ug)	.05	5.2	5.5	3.2-10
B12 (ug)	.05	.03	.4	.1-.2
C (MG)	4.4	4.3-5.0	1.0-1.1	5.4-5.7
D (IU)	+	22	36-42	40-43
E (IU)	1.5	2	.4	1.05-11

+ figures not available

Sources:

1) Alberta Social Services. 1983. A Guide to Infant Nutrition Community Health Services Nutrition Services. Edmonton.
2) Hambraeus, L. 1977. Propritary Milk vs Human Breast Milk in Infant Feeding. Ped. Cl. of North America 24:1:17-35.
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Nutritional Factors

Significant differences between mature human milk and cow's milk or milk-based formulas are observed for almost all constituents, water being the exception. The consequences of these differences for infant health are not all completely understood. However, research has revealed certain significant findings which will be discussed through an examination of the major nutrients in milk and the physiological implications. Table 2.1 compares the nutrient composition of colostrum, human and cow's milk and proprietary formulas.

Protein

The protein content of human milk is relatively low compared to the milks of most other mammals. Unlike other mammals, the human infant grows slowly and therefore it does not require as large an amount of protein. Human milk-protein also differs qualitatively from that of cow's milk in that human milk contains a higher whey protein to casein ratio (3:2) than does cow's milk (1:4) (Lawrence 1980). Some cows-milk-based formulas have a casein/whey ratio resembling human milk (American Academy of Pediatrics 1978).

The amino acid composition of human milk is species-specific, that is, human milk contains levels of

amino acids which differ more or less from the milks of other mammals and which are suited to human metabolism. For example human milk contains a higher cysteine to methionine ratios compared to cow's milk. This is of importance because newborn and especially pre-term infant livers are unable to effectively convert methionine to cysteine, an amino acid necessary for a rapidly developing central nervous system. Human milk also contains a relatively high concentration of taurine, an amino acid virtually absent in cow's milk. Taurine has been linked to bile acid conjugation and its role as a neurotransmitter or neuromodulator in the brain and retina is being explored (Lawrence 1980).

The predominant protein in cow's milk is B-lactalbumin, a whey protein which is absent in human milk. This protein is the commonest food allergen in infancy (Lawrence 1980; Jelliffe and Jelliffe 1977). The whey proteins in human milk form a flocculant suspension with zero curd tension in the low pH environment of the infant's stomach, encouraging easy digestion. In contrast the curd tension of cow's milk in a low pH environment is high, creating 'rubbery' curds which reduce the complete utilization of protein and in some cases obstruct the int ne (Lawrence 1980; Psiaki and Olson 1977).

Fat

Breastfed infants receive their main source of energy from

fat present in breast milk. The butter fat in cow's milk is replaced by vegetable oils in infant formulas to provide better fat absorption, however, coconut and maize oil, both poorly absorbed, are used as major fat sources in most commercial formulas (Hambraeus 1977). Human milk lipids are better absorbed by infants than are those in cow's milk and formula. Lipolytic activity is much higher in human milk which is rich in lipases (Gyorgy 1971). Lipases liberate free fatty acids from triglycerides preferentially from the 1 and 3-positions. Both the free fatty acids and the remaining 2-position monoglyceride are readily absorbed. Human milk contains a high proportion of palmitic acid in the 2-position which is well absorbed when presented as a monoglyceride. In contrast cow's milk and most vegtable oils contain triglycerides with palmitic acid mainly in the 1 and 3-positions. Free palmitic acid is poorly absorbed by the infant and when it comes in contact with calcium in the lumen it precipitates as calcium-palmitate soap. Consequently, the infant may be deprived of needed calcium as well as energy (Gyorgy 1971).

Human milk also contains a higher level of cholesterol than do other milks. The consequences of this are unclear, however, some relationships have been postulated. It has been suggested that exogenous cholesterol is needed for nerve tissue formation and bile salt synthesis, however, this has been difficult to determine experimentally

(American Academy of Pediatrics 1978; Psiaki, Olson 1977). It has also been proposed that cholesterol ingestion during infancy is necessary to induce enzymes for better metabolism of cholesterol in adult life (American Academy of Pediatrics 1978).

Carbohydrates

The major carbohydrate in milk is lactase, though other complex carbohydrates unique to human milk have also been identified. The nutritional significance of these complex carbohydrates is not yet clearly understood. A nitrogen-containing carbohydrate termed the 'bifidus factor' has been shown to have growth promoting effects on Lactobacillus bifidus bacteria (Psiaki, Olson 1977). In contrast to formula-fed infants, the intestinal flora of solely breastfed infants is predominantly L. bifidus. This ability to maintain L. bifidus is thought to contribute to the inhibition of the growth of undesirable bacteria (Matta, Wyatt 1971). L. bifidus ferments lactose to acetic and lactic acid, creating a poor environment for some pathogenic bacteria (Lawrence 1980; Psiaka, Olson 1977). The presence of lactic acid increases the resorptive capacity of the intestinal mucosa of the infant such that calcium, phosphorus, magnesium and other minerals are better absorbed (Lawrence 1980).

Vitamins and Minerals

The total inorganic constituents of human milk are lower than in cow's milk (Vorherr 1974). Lower mineral content in human milk decreases the osmotic load on the immature kidneys (Guyton 1976) and reduces the need for extra water. An infant's ability to concentrate urine is only about half that of an adult (Alberta Social Services 1983). Early introduction to cow's milk or improperly reconstituted formula could strain the immature kidneys of the infant. Continuing modification of infant formulas has reduced hyperosmolarity problems to a minimum. Nevertheless, problems still arise in formula-fed infants with dehydrating conditions such as diarrhea or fever (Speirs 1972; Lawrence 1980). When excess water is lost during illness there may not be enough water to form adequate amounts of urine; this may result in retention of potentially toxic products such as sodium and urea. Eventually a negative water balance would be created as fluid is moved from the body tissues to aid in the formation of urine.

In comparison to cow's milk, the iron content of human milk is also low. However, the iron in human milk is much better absorbed, approximately 50% as opposed to 10% in cow's milk, (McMillan, Landaw, Oski 1976). This low concentration of iron contributes to the bacteriostatic properties of human milk (Committee on Nutrition 1978). Formulas require excessive fortification because absorption is estimated to

fall between 4-10% (Alberta Social Services 1983).

Immunological Factors

The human infant does not develop a mature immune system until the age of 9 to 12 months (Gerrard 1974). At birth the infant is entirly dependent upon antibodies acquired transplacentally and via colostrum and breastmilk. A wide variety of immunoglobulins are provided by human colostrum and milk, including IgG, IgM, IgD, IgE and IgA. IgA is the most predominant and important immunoglobulin and carries antibody specificity to enteropathogenic Escherichia coli and other bacteria and viruses (Psiaka, Olson 1977). A small percentage of IgA antibodies are absorbed through the gut of the infant and provide systemic protection (Iyengar and Selvaray 1972), but a more important role is to provide antimicrobial protection for mucosal surfaces (Cowie et al. 1980). IgA interfers with the ability of potentially pathogenic organisms to attach to and penetrate the epitheleal walls (in this position E. coli liberates the enterotoxins responsible for diarrhea).

Colostrum provides a significant amount, and mature milk a somewhat smaller concentration of macrophages (mature monocytes or white blood cells capable of phagocytizing bacteria and large molecules) and lymphocytes (specialized

cells with the ability to attach to a specific antigen and destroy it) to the infant. Macrophages, have the ability to synthesize complement, lysozyme and lactoferrin. Lymphocytes, which produce IgA, have the ability to transfer delayed hypersensitivity from the mother to her infant thereby providing protection from organisms to which the mother has been exposed (Cowie et al. 1980).

Other immunological factors include lysozyme, lactoferrin and the bifidus factor. Lactoferrin, an iron-containing protein is found in high levels in human milk and has been shown to inhibit the growth of certain iron-dependent bacteria in the gastrointestinal tract (Committee on Nutrition 1978). Lysozyme, also present in relatively high concentrations in human milk has a direct bacteriocidal effect (Guyton 1976; Lawrence 1980). It also indirectly contributes to immunity by contributing to the development and maintenance of the special intestinal flora of breastfed infants (Mata and Wyatt 1971).

Developed countries with high standards of hygiene and adequate facilities for treating infections, no longer report gastrointestinal and respiratory infections as a major cause of infant death (Gerrard 1974). However, these diseases still remain a significant cause of illness in infants, thus resulting in undue stress and trauma upon both mothers and infants. Breastfeeding has been shown to play a

protective role. Studies have indicated a significantly reduced incidence and duration in breastfed children of diseases such as gastroenteritis (Larsen and Homer 1978; Cunningham 1977) and respiratory infections (Robinson 1951). The overall incidence of illness has been reported to be much lower in breastfed infants (Chandra 1979; Bloom et al. 1982; Schaefer et al. 1980).

Psychological Factors

Bonding, the formation of intense attachment, is a very real but difficult-to-evaluate process (Myers 1981). Early and prolonged contact between a mother and her newborn has been shown to contribute to the development of mother-infant bonding (Sosa et al. 1976). Breastfeeding by its very nature encourages and facilitates the bonding process.

Several authors make reference to an "early sensitive period" which occurs shortly after birth (Myers 1981; Jelliffe, Jelliffe 1977; Thomson et al. 1979). During this period a specific reflex action is thought to occur between mother and child. The eye-to-eye contact, skin-to-skin contact and the stroking which occur within the critical period are thought to enhance bonding. Closer contact is more likely to occur with breastfed infants, as it demands a more direct and intimate biologic relationship. Bottlefed

infants and their mothers are not necessarily unable to 'bond', but, attachment under these circumstances may require a conscious effort on the part of the mother (Alberta Social Services 1983).

Other Benefits

Breastfeeding has considerable medical advantages over artificial feeding and ensures the best nutritional and emotional start for the infant. In addition, several other advantages have also been documented, including a contraceptive effect; economic benefits; allergic reaction prevention; and benefits to the mother.

Contraceptive

Breastfeeding has been shown to have a contraceptive effect and may play a significant role in population control. Hormones released in response to an infants suckling, necessary to encourage milk production, also produce a anovulatory effect. Prolactin, the pituitary hormone responsible for milk production, is also responsible for a diminished ovarian response to gonadotropins (Lawrence 1980). This contraceptive effect has not been shown to be consistent for all individuals, however, when large populations breastfeed the effect has been shown to reduce the overall birthrate (Canadian Paediatric Society 1978).

Consequences of the decrease in breastfeeding in developing countries as well as amongst low income groups within developed countries exacerbates problems of food shortage and economic strife (Jelliffe, Jelliffe 1975). In developing countries, the purchase of an adequate quantity of formula can require as much as one third of a worker's income (Jelliffe and Jelliffe 1975). When a means of child-spacing, such as breastfeeding, is lost, and more children are born within a shorter period of time, an increasing economic strain is placed on individual families.

Economic

Economic difficulties are aggravated in low income families when breastfeeding is replaced by artificial feeds. Although statistics vary within and between countries, the minimum amount of money spent on artificial feeds is generally much more than the minimum amount needed to purchase extra nutrients to support breastfeeding (McKigney 1971; Jelliffe and Jelliffe 1975). The nutrients required for breastfeeding are usually obtained from a moderate increase in a mother's normal diet.

From a national standpoint, when breastfeeding is replaced with bottlefeeding a significant resource is lost. Production and manufacture of artificial feeds require lactating cattle, energy and raw materials for processing,

packaging, distributing, preparing and refrigerating. In resource-poor nations it becomes necessary to import processed formulas from abroad, at great expense. Wealthy nations too must contend with the flagrant waste of energy when a more efficient production method is already in place. As well, nations where bottlefeeding replaces breastfeeding are more likely to be faced with higher medical costs since bottlefed infants are more prone to infections (Mata and Wyatt 1971; Psiaka and Olson 1977).

Allergies

Allergies to foods and other products are genetically determined, and breastfeeding will not necessarily prevent them from developing (Lawrence 1980). However, the intestinal tract of the newborn infant is anatomically and immunologically immature for the first six weeks of life (Lawrence 1980) and during this period the early introduction of foods other than human milk may predispose the infant to an allergic reaction. The immaturity of the intestinal epitheleal lining permits the absorption of intact proteins from cow's milk and other potentially allergenic foods. Although the child may not be inherently allergic to proteins in cow's milk, the protein macromolecule is registered as a foreign invading body. In this case the term 'food intolerance' rather than 'food allergy' is more appropriate (Allergy Information Association 1983). Although the symptoms are allergic in

nature, as soon as the gastrointestinal tract has matured and large or foreign substances can be interrupted at the mucosal layer, the food will be well tolerated.

Benefits to Mother

If breastfeeding occurs soon after birth, rapid delivery of the placenta is enhanced and excessive bleeding is prevented. Suckling causes the production of the hormone oxytocin which facilitates the let-down reflex necessary for successful breastfeeding. Oxytocin also enhances blood vessel constriction and uterus contractions, for delivery of the placenta as well as more complete uterine involution (Lawrence 1980).

Summary and Conclusion

Although many healthy children have been reared on formula milks, research does illustrate that breastfeeding is superior. The advantageous effects of breastfeeding are seen most noticeably within populations where poverty and lack of hygiene are problems. The differences are less easily detected in wealthy, privileged classes but, nevertheless are real.

The knowledge that breastmilk is superior will not in and of itself necessarily encourage more mothers to breastfeed. The

commonly made assumption that providing information results in major changes in infant feeding practices has been questioned (Bentovim 1976; Newton and Newton 1967). Bentovim (1976) describes breastfeeding as the product of a complex network of variables. In addition to the obvious personal variables such as knowledge, Bentovim (1976) describes other variables such as the family and cultural environment. Familial characteristics might include number and age of children, relationship to extended family and child- rather than adult-centredness. Women's occupational roles in society and their opportunity to breastfeed, and support regarding breastfeeding from health-care professionals are two of many possible cultural or societal variables.

Various authors emphasize different variables as key points for intervention in efforts to promote breastfeeding. Common to much of the literature is a concern with attitudes; particularily, attitudes of mothers and of the health professionals who are responsible for caring for those new mothers.

It appears to be contradictory that researchers are preoccupied with attitudes, when in actuality, most interest focuses on behavior, specifically, the incidence and duration of breastfeeding among mothers and breastfeeding promotion on the part of health professionals. Although behaviors pertaining to the breastfeeding issue are

relevant, ultimately researchers are interested in the ability to predict behavior from a knowledge of personal attitudes. Behavior is the outcome of personal attitudes and situational stresses. On any given occasion situational factors may have a greater influence on behavior than personal attitudes, however, it is the attitudes which provide the continuity from situation to situation. It is this theoretical continuity which justifies empirical emphasis on attitude research (McGuire 1976). Chapter III describes the conceptual model used to design an instrument to measure health professionals' attitudes toward breastfeeding.

CHAPTER III

CONCEPTUALIZING THE CONSTRUCT ATTITUDE

The Conceptual Model

The development of valid attitude measurement procedures requires a clear definition of the concept 'attitude'. Traditionally, attitude has been viewed as having three components: affect, cognition and conation (Zimbardo et al. 1969). Affect referred to a person's evaluation of, liking for, or emotional response to some issue. Cognition referred to an individual's beliefs about or factual knowledge of the object, and conation described the individual's overt behavior directed toward the issue (Zimbardo et al. 1969). Despite this, distinctions are often not made between these three components. Specifically, an examination of the current breastfeeding literature revealed that researchers frequently used labels such as, attitude, belief, opinion, value, and intention, interchangeably.

A number of different methods have been devised to measure attitudes. These include single statements of feelings, knowledge, intentions, beliefs and opinions to attitude scales such as those of Likert, Guttman and Thurstone, to

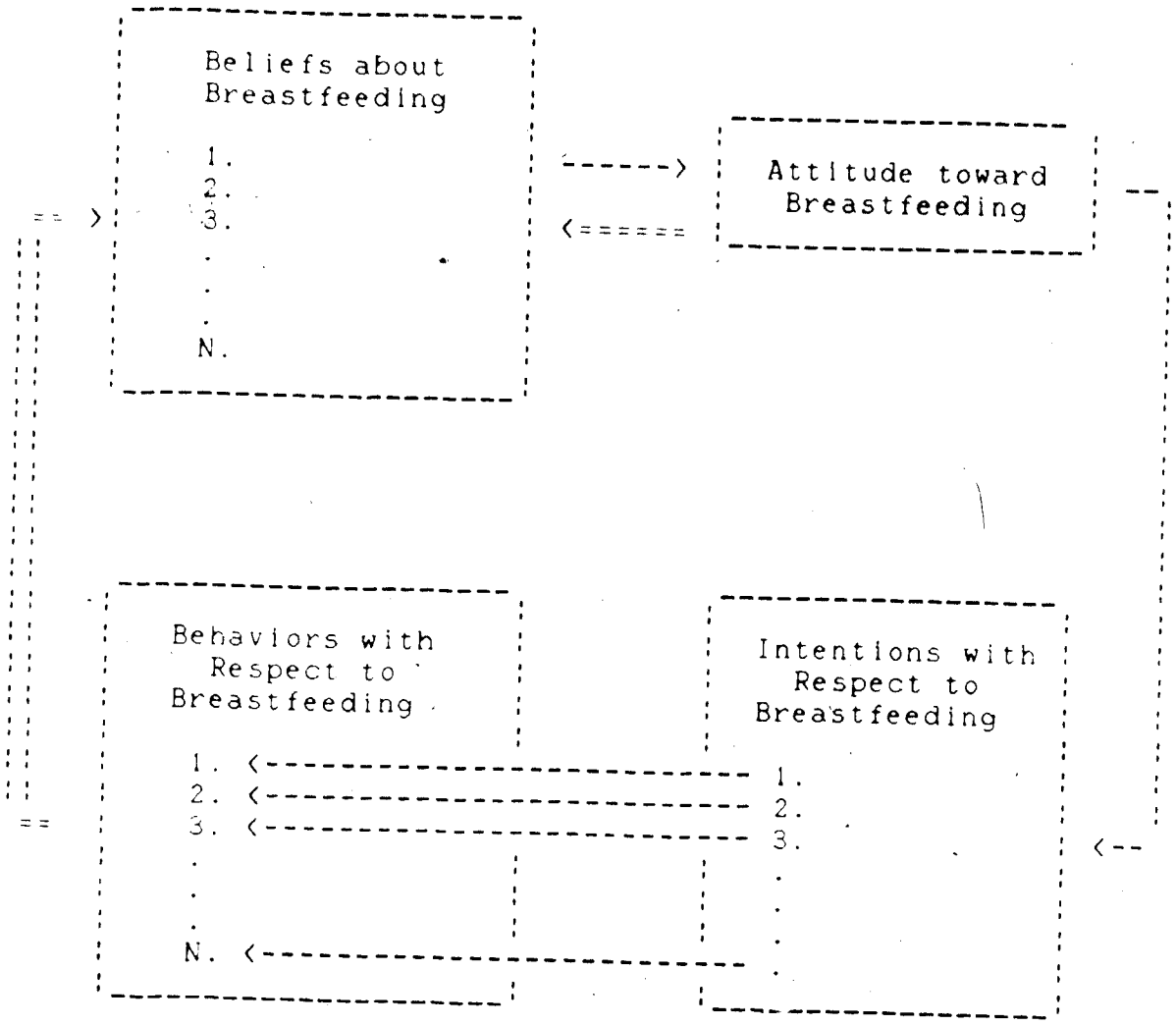
observations of behavior and physiological responses (Fishbein and Ajzen 1975). The results obtained by these various methods have been found difficult to compare. For example women may know breastfeeding is nutritionally superior yet not breastfeed; two different "attitude" studies on the same population, both within the boundaries of Zimbardo's et al. definition, one based on nutrition beliefs (cognition), the other on actual behavior (conation), would arrive at different conclusions. The study utilizing a belief measure would assess the population as having a positive attitude toward breastfeeding. The study assessing behavior would conclude a negative attitude. When researchers arbitrarily define the term attitude and then intuitively select a measurement procedure which seems to fit the purpose of their study, comparison of the results between individual studies appear contradictory and confusing (Fishbein and Ajzen 1975).

A more useful approach would be to define a construct such as attitude in terms of its relations to other constructs in a theoretical network (Fishbein and Ajzen 1975). The value of this approach is that procedures for measuring attitudes should be apparent when using an unambiguous conceptual definition. Fishbein and Ajzen have outlined a general conceptual framework which would permit a systematic theoretical analysis of breastfeeding attitudes. The basic premise of the model is that clear distinctions should be

made between the constructs, beliefs, attitudes, intentions and behaviors. Although other authors have differentiated between the constructs, Fishbein and Ajzen's model is unique in that it discerns specific relationships among them. Figure 3.1 illustrates the model.

Beliefs are the basic building blocks in the conceptual framework. They represent the information individuals have about an issue. Beliefs refer to the subjective probability that certain attributes can be linked to some object or issue, which in this case is breastfeeding. For example, an individual may believe that "breastfeeding" (the issue) confers "protection" (an attribute) against some infections and "breastfeeding" is "convenient". An evaluation of those breastfeeding attributes influence a feeling or attitude toward breastfeeding. Many beliefs may be held about breastfeeding but only a relatively small number serve as determinants of attitudes at one specific time. These beliefs are known as salient beliefs. Under most circumstances only five to nine items of information about a particular issue can be processed at one time (Fishbein and Ajzen 1975). Salient beliefs are subject to other influences and may be replaced, strengthened or weakened. Attitudes are related to the totality of salient beliefs, not necessarily to any one particular belief, and beliefs may be changed or formed by attitudes and/or behaviors. Although it is possible to obtain a direct measure of attitude it is also

Figure 3.1: CONCEPTUAL FRAMEWORK RELATING BELIEFS, ATTITUDES, INTENTIONS AND BEHAVIORS.



_____ Influence

=========== Feedback

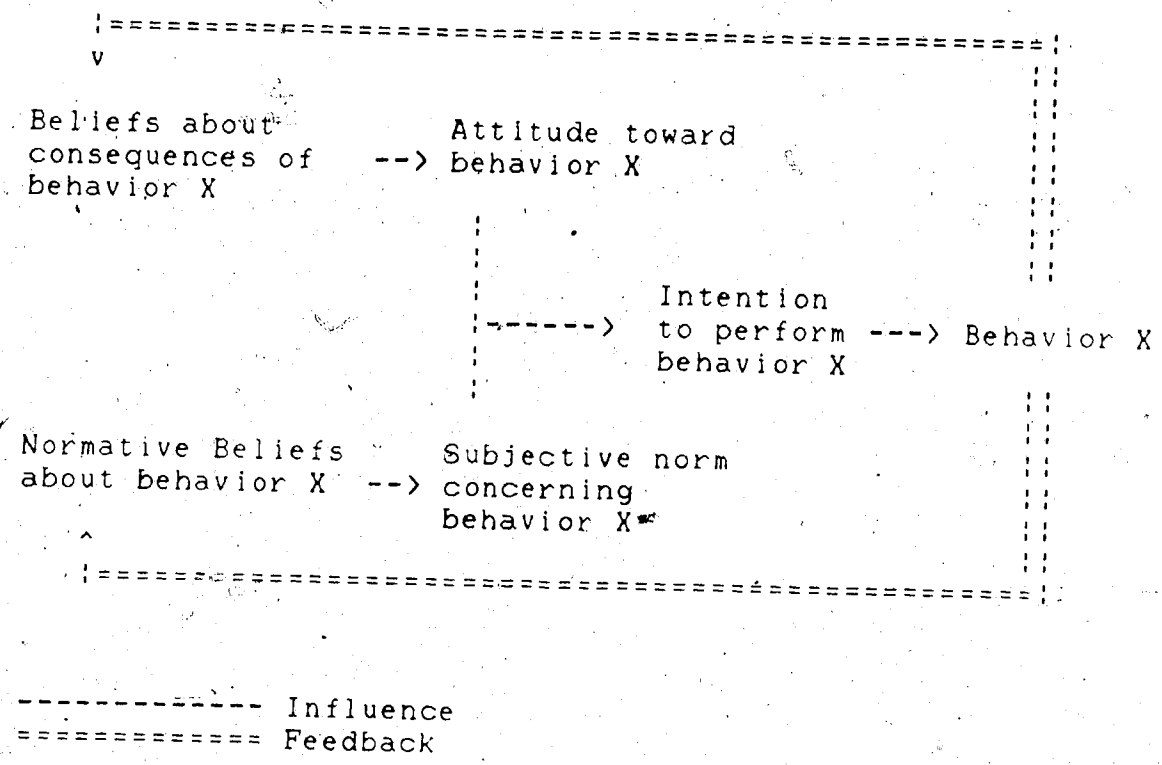
Adapted from: Fishbein and Ajzen, 1975. Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. Addison-Wesley Pub. Don Mills, Ont. (P.15)

possible to estimate attitude by assessing the responses to a set of beliefs.

Attitudes are "the amount of affect for or against an object or issue" (Fishbein and Ajzen 1975). The process of forming an attitude is viewed as a process of cognitive summation and it is expressed as positive, negative or neutral feelings. Theoretically, if beliefs about breastfeeding are associated with primarily positively evaluated attributes, a positive attitude will result. For example, an individual may have the following salient beliefs regarding breastfeeding: it is nutritionally superior to the alternatives; it delays the resumption of ovulation in the mother; and, it is not socially-acceptable to nurse in public. The first two beliefs have positive attributes while the third would probably be evaluated negatively. This individual is likely to have a positive feeling toward breastfeeding.

Intentions refer to a subjective probability that an individual will perform a behavior. Intentions are determined by two factors: attitude and subjective norms (Figure 3.2). According to Fishbein and Ajzen's model, attitude is viewed as a general predisposition, consequently it does not predispose an individual to perform any specific behavior. Rather, it leads to a set of intentions which taken together, reflect a general favorableness or

Figure 3.2: CONCEPTUAL FRAMEWORK FOR THE PREDICTION OF SPECIFIC INTENTIONS AND BEHAVIORS



Adapted from: Fishbein, M., and I. Ajzen (1975) Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. Addison-Wesley Pub. Don Mills, Ont. (P. 15)

unfavorableness. Therefore an individual may have a positive attitude toward breastfeeding and still express some intentions which would not reflect favorableness. For example, an individual may have a positive attitude toward breastfeeding and claim the following intentions: will breastfeed her children; will contribute volunteer hours to La Leche League (a breastfeeding-support group); but will not canvass door to door, fund-raising for La Leche League. Just because an instrument evaluates an individual having a positive attitude toward an issue, it does not also permit accurate predictions of her every behavioral intention. Intentions are also influenced by subjective norms, which are those beliefs that certain referents think the individual should or should not perform the relevant behavior. For example, a maternity ward which adheres to strict schedules and does not allow demand feeding for infants breastfeeding, distributes infant formula samples to new mothers, and satisfies crying babies with glucose-water or formula, might lead nurses to conclude that the hospital administrators believe breastfeeding should not be encouraged. Individuals may or may not comply with normative pressures. Attitudes may be inferred from an assessment of a large set of intentions, however, the influence of subjective norms on each intention must also be taken into consideration (Fishbein and Ajzen 1975). Unlike beliefs, intentions do not determine attitudes. Attitudes are viewed as determining the overall favorability of a set of

intentions.

Each intention is related to a specific behavior. Similarly, as a set of intentions reflects a general feeling, overall favorableness or unfavorableness toward an object or issue is also related to a set of behaviors and not to any specific behaviors.

Once performed, a behavior may strengthen old beliefs or lead to new ones. For example, a mother who actually breastfeeds her child may, as a result, form a new belief concerning the convenience of the method.

To summarize, attitudes are determined by a set of salient beliefs regarding an issue. In turn once established, an attitude may influence the formation of new beliefs. An attitude would influence a set of intentions pertaining to the issue and each intention is related to a corresponding behavior. Performing a particular behavior may lead to new beliefs which may correspond to a change in attitude.

Fishbein and Ajzen's conceptual model of attitude provides the basic methodology for exploring attitudes toward breastfeeding.

Investigations of Breastfeeding Attitudes

Current literature, specific to health professionals' breastfeeding attitudes, appears to lack a general theory. This section will illustrate some typical problems. Previous research on health professionals' attitudes toward breastfeeding has focused on both the determinants of such attitudes as well as their effects on other variables. Generally, no objective methods of defining or measuring health professionals attitudes toward breastfeeding have been given. Therefore, meaningful comparisons of the numerous studies have proven to be difficult. The following examples are illustrative of common problems.

Research carried out by Brown et al. (1960) was actually testing the hypothesis that mothers who elect to breastfeed differ significantly in a variety of personality dimensions from mothers who choose to bottlefeed. As an aside, results from two informal surveys of attitudes towards breastfeeding among the hospital staff and first year nursing students were included. Little explanation of methodology or analysis techniques were provided. Only the questions used in the surveys and the distribution of responses obtained were presented. From an examination of the questionnaire items, it appears as though the researcher was actually measuring beliefs. This study did not appear to differentiate between

beliefs and attitudes, as the two terms were used interchangeably. The results of the informal study indicated the hospital staff had predominantly negative attitudes toward breastfeeding. Negativeness toward breastfeeding was explained as a result of insufficient training and from a perceived loss in control of the type and amount of nourishment the infant receives. It was also suggested that the reason that mothers reported a low incidence of cooperative behavior from nurses with regard to breastfeeding was a result of nurses negative attitudes. However, the research did not objectively substantiate such claims; no measurement techniques were described and no definition of attitude was provided.

A study done by Estok (1973) was undertaken to determine if nurses could identify common problems mothers have with breastfeeding after discharge from hospital and if this ability was dependent upon, amongst other things, nurses' attitudes toward breastfeeding. In this study, attitudes were measured by a single question which asked, "What do you believe is the best kind of infant feeding? Breast, bottle, other". No indication was given as to the reliability or validity of assessing attitudes based on a single belief statement.

Burgess (1980) examined what doctors, nurses and midwives know and think about breastfeeding. Again, little indication

as to methodology and analysis of attitude assessment was given. The type of questions used in the survey and the responses were presented, but without discussion as to whether the instrument had been validiated. There was also no indication given as to how an attitude assessment was determined using the results gathered. As in the aforementioned studies no distinction was made between belief and attitude, the terms were used interchangeably.

A descriptive study by Huntingford (1962) appeared to correspond to Fishbein and Ajzen's conceptual model of attitude. Attitudes toward breastfeeding, subjective norms and intentions were assessed. However, no relationship between the constructs were explored. As with Estok's study, attitude assessment was based on responses to one question and again, methodology and analysis were not clearly explained.

Hollen (1976) examined the attitudes and practices of obstetricians and pediatricians. Attitude assessment appeared to be based on responses to four questions. One elicited feelings toward breastfeeding and the rest concerned medical advantages of breastfeeding. Hollen concluded that the attitudes of physicians toward breastfeeding "is generally one of indifference". Although most physicians who participated in the study were apparently aware of many of the advantages of breastfeeding,

the majority made little or no effort to convince mothers that it was important or to encourage mothers to breastfeed. It would appear Hollen averaged the positive responses to the "medical advantages" of breastfeeding with the high negative response to the "intentions to promote breastfeeding" and concluded attitudes were "neutral". Although Fishbein and Ajzen's conceptual model of attitude indicates that both beliefs and intentions are related to attitude, it specifies that this is with respect to a "set" of beliefs or a "set" of intentions. Hollen's investigation utilized only multiple-indicators of one belief: medical advantages of breastfeeding. As well, she used only one intention. Fishbein and Ajzen suggest that only one belief and one intention are not valid indicators of an attitude.

A survey done by Martin (1978) was designed to obtain information about mothers attitudes toward breastfeeding, and probably is the most sophisticated attempt at measuring breastfeeding attitudes. Twenty-six statements regarding breast and bottlefeeding were compiled in a questionnaire. The statements were based on views expressed by mothers during exploratory interviews. Respondents indicated their degree of agreement or disagreement with each item. The responses were analyzed by factor analysis (the details of which were provided). Three uncorrelated factors were isolated by the procedure, which Martin interpreted as three distinct "attitude dimensions" or "beliefs". Martin used the

data in a descriptive manner to distinguish between various groups of mothers relative to their scores on the three factors. An overall attitude score was not assessed.

Because it is the best available in the field, Martin's study was used as a model for the present investigation. However, the present investigation was modified so that it was applicable to health professionals. As well, a single attitude score was assessed, which Martin did not do. The present investigation concentrated on testing the reliability and validity of the measurement instrument. This is in contrast to Martin's study which proceeded to apply the instrument to discriptive research.

Summary and Conclusion

It would appear that quantifying health professionals attitudes toward breastfeeding is at the same time desirable, complex and problematic. Although considerable attention has been focused on the role that health professionals' attitudes regarding breastfeeding have on breastfeeding success (Albers 1977; Applebaum 1975; Kemberling 1979; Myers 1981; Winikoff and Baer 1980), only a handful of studies have actually researched breastfeeding attitudes. The construct attitude has traditionally been a difficult task to conceptualize in all fields of study;

primarily because the term "attitude" lacks a common definition (Fishbein and Ajzen 1975). The research that has been done rarely offers a definition of the term and seldom refers to any theory which could substantiate methodological techniques. Despite the dearth of objective research, recommendations that "health professional's attitudes toward breastfeeding are in need of improvement" proliferate (Canadian Pediatric Society 1978). It is the contention of this author that the available research which supports such claims is inadequate. An instrument which could be used to quantify health professional's attitudes toward breastfeeding is a necessary first step. Chapter IV describes the development of such an instrument.

CHAPTER IV

DEVELOPMENT OF THE RESEARCH INSTRUMENT

Introduction

As the foregoing literature review has shown, health professionals' attitudes toward breastfeeding are relatively unstudied. The present study was designed to qualify and quantify the nature of the construct, 'breastfeeding attitude', as it applies to health professionals. The conceptual model used in this investigation was discussed in the previous chapter.

Every effort to gather information does not require a strict probability sample survey. For the majority of occassions when surveys are undertaken the goal is to obtain estimates of population parameters. The present study was not designed to yield a precise and accurate picture of health professionals' attitudes, but rather to determine how to elicit those attitudes in an objective and valid manner. More specifically the study was designed to:

1. Develop a reliable and valid instrument to measure health professionals' attitudes toward

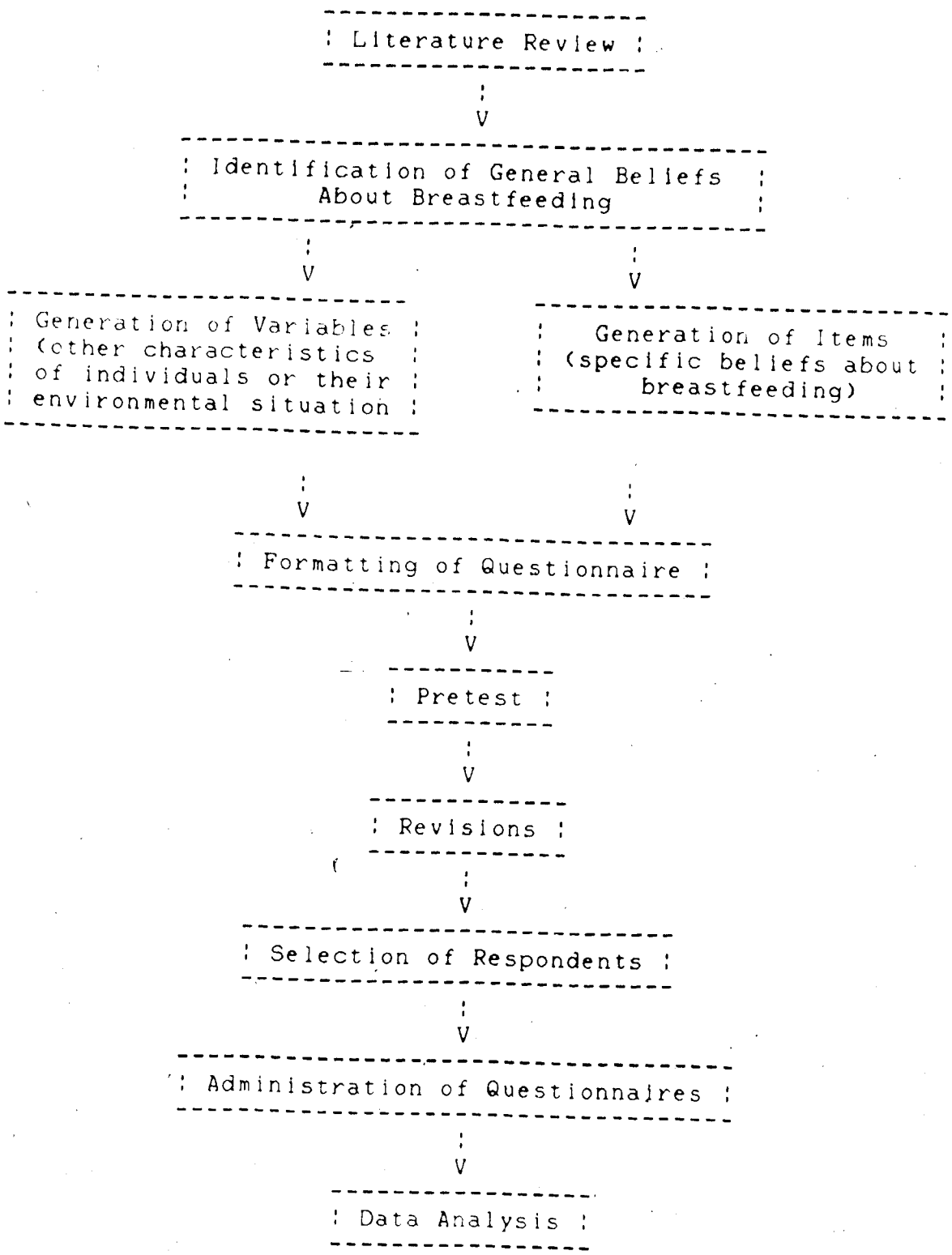
breastfeeding.

2. Elucidate data on underlying dimensions of attitudes toward breastfeeding.
3. Describe the views of various health professional groups and individuals regarding breastfeeding.
4. Examine the possibility of linking specific independent variables to breastfeeding attitudes.

Overview of Design

Figure 4.1 depicts a flow chart of the developmental stages in designing the instrument. Initially, a review of the pertinent literature was made with an emphasis on the contributing role of health professionals in the breastfeeding process. Those beliefs regarding breastfeeding, which were expressed frequently in the literature, were examined; from them five general beliefs were isolated. The items chosen for inclusion on the questionnaire were multiple indicators of these five general beliefs. In addition several items were included which provided information on two other classes of variables, demographic background and environmental situations. The questionnaire was pretested and revisions were made. The revised questionnaire was then administered and the results analyzed. A detailed discussion of the development of the

Figure 4.1: DEVELOPMENT OF A RESEARCH INSTRUMENT TO MEASURE HEALTH PROFESSIONALS' ATTITUDES TOWARD BREASTFEEDING



instrument follows. A copy of the questionnaire is provided in Appendix A.

Identification of General Beliefs

Fishbein's conceptual model indicates that attitudes are based on salient beliefs. The totality of an individuals salient beliefs about a specific issue form the informational basis for his/her attitude toward that issue. To better facilitate the identification of health professionals' salient beliefs about breastfeeding it was necessary to first determine what general beliefs were commonly held. The primary function of the general beliefs were to serve as "instrumental tags" to facilitate discussion. Once the general beliefs were ascertained, multiple indicators of each were generated. The items appearing on the questionnaire were specific belief statements reflecting the general beliefs. For example, an individual might hold the general belief that "breastfeeding is nutritionally superior to formula feeding". Specific beliefs about the nutritional qualities of both methods of feeding might include: the iron in breastmilk is absorbed in greater quantities; the fat in breastmilk is easily absorbed; and breastmilk does not provide sufficient amounts of vitamin D. The general beliefs are a descriptive interpretation of a pattern of specific beliefs.

Table 4.1 lists the five general beliefs which were hypothesized and the specific beliefs which were on the questionnaire. The first three general beliefs were drawn from a study examining mothers' attitudes toward breastfeeding (Martin 1978). Martin's investigation was the only research on breastfeeding attitudes which studied attitudes in relation to what she termed, interchangeably, "dimensions" and "beliefs". The other two general beliefs were derived from an examination of the larger general literature. We now look at the five general beliefs.

The most frequently stated belief regarding breastfeeding is that "breastfeeding is best". Martin suggested that this "dimension" was influenced by beliefs that breastfeeding is or is not best for babies from a physical or emotional point of view. The general belief "breast is best" could conceivably contribute significantly to a favorable attitude toward breastfeeding and several researchers have assessed breastfeeding attitudes solely according to responses to the above statement (Estok 1973; Huntingford 1962). However a number of authors have expressed some doubt as to whether expressed beliefs are always consistent with actual attitudes (Applebaum 1975; Jelliffe and Jelliffe 1977; Kemberling 1979; Winikoff and Baer 1980). It has been suggested that health professionals really believe that breast and bottlefeeding are completely interchangeable even

TABLE 4.1: HYPOTHESIZED GENERAL BELIEFS INFLUENCING BREASTFEEDING ATTITUDES

GENERAL BELIEFS	SPECIFIC BELIEFS	NUMBER OF ITEM IN QUESTIONNAIRE
1)Superiority of Breast-feeding	-it is the best food	24,55
	-it provides optimal nutrition	28
	-science has not developed a nutritionally superior formula	42
	-less likely to see illness	15
	-is a form of birth control	32
	-helps prevent cancer	33
2)Distaste for Breastfeeding	-it is old-fashioned	7
	-if breastfeed can't wear fashionable clothing	8
	-father feels left out	14
	-feels unpleasant	18,31
	-is messy	20
	-is animal-like	22,43
	-Breastfeeding ruins the mother's body	19
3)Convenience of Bottle or Breastfeeding	-breastfeeding ties mother down	6,21
	-bottlefeeding less trouble	11,13,26,27
	-breastfeeding restricts social life	12
	-breastfeeding is time-consuming	25
	-bottlefeeding permits accurate assessment of amount consumed	29
4)Social Accep-tability of Breastfeeding	-breastfeeding should be discussed in schools	16,48
	-bottlefeeding is the norm	30
	-breastfeeding is not acceptable done in public	37,49,50,56
	-society does not support breastfeeding	9,38,40,41, 46,47,52,53
5)Moral Respon-ibility to breastfeed	-all should breastfeed	10,35,36,54
	-breastfeeding mothers feel closer to their babies	17
	-babies prefer the breast	23
	-bottlefeeding is unnatural	34,39,45
	-to be breastfed is a child's birth right.	57
	-breastfeeders better mothers	44

though they apparently endorse the notion that "breast is best"; some health professionals are quick to offer formula at the slightest provocation (Applebaum 1975). The present investigation was designed to determine if beliefs relating to the superiority of breastfeeding are salient among health professionals. Specific beliefs related to the material covered in Chapter II, and which would reflect a general belief in the superiority of breastfeeding, were used in the survey.

The second general belief embodies an appeal or a distaste for breastfeeding. Martin (1978) termed her dimension "Distaste for Breastfeeding" and included specific beliefs such as: it feels unpleasant, and it is old-fashioned. Other authors have also alluded to this general breastfeeding belief. Lerner (1979) suggested that societal norms conflict with the act of breastfeeding; implying that feelings of shame, guilt and anxiety over the erotic stimulation involved in breastfeeding are common. Lerner also suggested the normative view is that breastfeeding results in a loss in attractiveness, freedom and comfort. Burgess (1980) also explored a disgust dimension. She elicited a significant negative response from health personnel to a photograph of a nursing pair lying down. Ellis (1981) discussed society's role in eroticizing the breast such that it was more acceptable to expose breasts for erotic purposes than to expose them for breastfeeding. She also stated that many

individuals felt that breastfeeding is primitive and crude, especially if it continues for more than a few months. A comment from a medical doctor exemplifies the second belief, "anyone who would nurse a child into the 3rd or 4th year had to be 'sick'" (Avery 1977).

The third general belief identified by Martin reflected beliefs about the convenience of either breast or bottlefeeding. A wide variety of convenience attributes are linked to both infant-feeding methods. For example, breastfeeding often requires special clothing designed for easy access to the breast; also, a nursing couple cannot be separated for long periods of time without elaborate arrangements. Bottlefeeding is considered by some to be more convenient as it permits accurate assessment of amounts of milk consumed or because it allows other people to feed the infant. The specific beliefs for use in the questionnaire were derived from studies which had examined the mother's perception of convenience. The concern of the present study was in determining whether these were also salient beliefs of health professionals.

The fourth general belief describes public acceptability of breastfeeding. Reference is made often to the taboo on nursing in public (Avery 1977; Bacon and Wylie 1975; Ellis 1983; Ladas 1970; Martin 1978; Mackey, Fried 1981; Newton and Newton 1967). Real or anticipated embarrassment about

breastfeeding in social situations has been included in a list of deterrents to breastfeeding (Ellis 1983).

> We have nearly eradicated the nursing mother from existence in most parts of the country so that those who exist are kept out of public view and deprived of institutional supports. However, we have not erased the idealized image of the nursing mother from our collective or personal unconscious. (Blachman 1981)

The fifth general belief, reflecting the sentiment expressed by Blachman in the latter half of the the above statement, was designated, "moral responsibility to breastfeed". It reflects the "naturalness" of breastfeeding. Specific beliefs engage a romanticized impression of breastfeeding, a return to the natural and pure. This general belief supports an "idealized image" of breastfeeding without specifying its unique qualities, such as nutritional, immunological or psychological benefits. Rather the concern is with the virtuousness of breastfeeding in general conduct; a distinction between right and wrong.

Items included in the questionnaire were chosen to reflect the five general beliefs about breastfeeding (Table 4.1). Some were borrowed from other studies and others were independently generated.

Demographic and Environmental Variables

Two classes of variables are commonly included in

descriptive research such as the present investigation:

1)characteristics of the individual

2)characteristics of the environment

A secondary purpose of the present investigation was to test the validity of the measurement instrument by determining whether it was able to differentiate between different groups of people. The following discussion includes a list of personal and environmental variables commonly cited in the literature and the reasons why they were pertinent to this study.

Personal Characteristics

Age. (Question number 2 on the questionnaire.) There is an entire generation of women for whom bottlefeeding was the dominant method of infant feeding. In the period from 1963-1973 the national average of breastfeeding mothers was below 40% (McNally et al. 1985). From 1973-1978 the national breastfeeding-rate climbed to 61% and in 1982 it rose to 75%. It has been suggested that trends of the era in which the respondents were parenting might be reflected in their attitudes. Blachman (1981) suggests that women's attitudes toward breastfeeding will reflect the overall birth decisions they made when they were having their own children.

Years_of_Post-secondary_Education. (Question number 3 on the questionnaire.) It was hypothesized that the extent of education should increase knowledge about the breastfeeding issue' thus inducing a more positive attitude. It is well known that education is linked to the breastfeeding decision, more mothers with higher education breastfeed their infants than those with less schooling (Yeung et al. 1981).

Occupation. (Question number 4 on the questionnaire.) Brown (et al. 1960) found that student nurses had more positive attitudes toward breastfeeding than did other hospital staff. Other authors have suggested that specific professions, such as nursing (Auerbach 1979), obstetrics (Applebaum 1975) and pediatrics (Isbister 1974) should embody more positive attitudes than other professions due to the perceived role of their practitioners.

Parental_state_and_infant_feeding_practice. (Question number 75 on the questionnaire.) Belief and attitide differences between parents and non-parents and between breastfeeding parents and non-breastfeeding parents were hypothesized. However, it is not obvious which group will have the more positive attitude because the beliefs and attitudes are contingent upon a number of other factors. For example, a breastfeeding parent may have had a negative experience with breastfeeding which may influence a negative attitude.

However, the purpose in this investigation was to determine if differences did occur between these groups. Additional research could elucidate underlying reasons for the differences.

Themselves breastfed. (Question number 78 on the questionnaire.) This variable is often included in breastfeeding research (Beske and Garvis 1982; Mackay and Fried 1981). Newton and Newton (1967) suggested that those who were breastfed, more often breastfeed their own children than those who were not breastfed.

Environmental Characteristics

Number of years in this job and years in the profession. (Question number 5 on the questionnaire.) Research by Brown et al. (1960), indicated that student nurses have a positive attitude. The authors hypothesized that once these optimistic individuals entered the work force they encountered little support for breastfeeding ideals and would soon develop less positive breastfeeding attitudes. Individuals with less job and professional experience were hypothesized to have more positive attitudes and beliefs than individuals with greater experience.

Time schedule. (Question numbers 69 and 70 on the question-

naire.) Although a significant proportion of mothers' difficulties with breastfeeding are physical (Estok 1973), the most common problems are social and emotional in nature. These problems take time and special patience to deal with (Hall 1978). If schedules are busy, health professionals may only find time to tend to the obvious physical problems rather than the less obvious social and emotional problems mothers may be experiencing. A possible effect of perceived busy-ness on attitudes was explored.

Geographical origin. (Question number 72 on the questionnaire.) McNally et al. (1985) summarized the results of nine studies on breastfeeding trends in Canada. The results indicated that incidence and duration of breastfeeding varied significantly according to region. Individuals residing in the western provinces appear to have a higher incidence and average duration of breastfeeding. Regional differences in attitudes toward breastfeeding were explored in the present study.

Friends who have or are breastfeeding their children. (Question number 77 on the questionnaire.) This variable has been used in other studies regarding breastfeeding attitudes. It has been hypothesized that more exposure to breastfeeding should foster a more positive attitude (Ladas 1970). However, this is not a consistent finding as Mackay and Fried (1981) found no correlation. Presumably this

relationship could work in either direction; ie having friends who have had negative experiences with breastfeeding could foster a negative attitude.

Measurement

Fishbein and Ajzen (1975) define attitude as the amount of affect or feeling for or against an issue. This definition suggests attitude should be measured by a method which will yield a single score representing an individual's location on a bipolar affective dimension. For example, breastfeeding attitudes could be measured by asking subjects to check positions on a series of five-place bipolar affective scales such as like-dislike or approve-disapprove. Self-report is one legitimate method of obtaining information, however, it may not be the most accurate method. There are many reasons, conscious and unconscious, why individuals do not give totally accurate self-reports (a good review is presented by Webb and Salancik 1970). A possible reason why health professionals may not report accurately pertains to a trend in the current literature which implicates health professionals negatively in relation to successful breastfeeding (Applebaum 1975; Avery 1977; Blachman 1981). Health professionals could consciously or unconsciously be motivated to "appear" more positive.

An indirect, rather than a direct method was selected to measure health professionals' attitudes toward breastfeeding. Attitudes were quantified by computing an index from responses to a set of belief items. Fishbein and Ajzen's conceptual definition of attitude states that an individual's attitude toward an issue is related to his/her beliefs that the issue possesses certain attributes and to his/her evaluation of those attributes. Techniques which utilize measurements of beliefs and their associated evaluations serve as indicators of a person's attitude.

In order to measure health professionals' attitudes toward breastfeeding it was necessary to identify the attributes linked to breastfeeding, then to determine how each attribute was evaluated, and finally to measure the strength of the beliefs.

A number of methods may be employed to identify attributes. Usually a subject is asked to describe his/her thoughts on the issue in question. For example, in response to the following question: "What do you think about breastfeeding?" the following thoughts might be elicited: breastfeeding is natural; breastfeeding is old-fashioned; and breastfeeding is publically acceptable. These can be used to construct statements for use in a questionnaire. A review of the current literature elicited a large number of beliefs held by health professionals about breastfeeding, therefore it

was not necessary to directly identify attributes.

For the purposes of this investigation, a measure of each subject's attribute-evaluation was not obtained, rather it was assigned by the investigator and assumed to be the same for all respondents. For example, the attribute natural was evaluated as indicating a positive feeling.

The final step, measuring belief strength was the focus of the questionnaire. To obtain belief strength, each statement was rated on a Likert-style scale as follows:

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
1_____	2_____	3_____	4_____	5_____
SA	A	N	D	SD

By computing an index of responses to a set of belief items assumed to reflect a particular attitude, a single score is obtained. This score places an individual along a single dimension of affect.

Questionnaire Format

The data-collection instrument was a self-administered questionnaire consisting of three parts. Part 1 contained socio-demographic questions. Part 2 consisted of fifty-four statements regarding beliefs about breastfeeding plus

fifty-four corresponding bi-polar scales. The third section included some open-ended questions and some closed questions pertaining to personal and environmental variables which were hypothesized to be related to breastfeeding attitudes.

Initial reactions to statements are most likely to reflect true feelings (Payne 1973). Payne suggested that when respondents are allowed time to contemplate the meaning of the statement, other factors such as social norms or attempts to guess the "right" answer may influence their response. To this end, respondents were instructed to refrain from consulting with others, give their initial responses, answer the questions in the order presented and complete the questionnaire within the suggested time limit. The fifty-four belief statements were randomly distributed according to content, so as to prevent response sets in which a respondent may just start circling a particular response category with little consideration of the question.

The length of the questionnaire was a concern. It contained a total of 78 questions and required 100 separate responses. To increase the appeal of the voluntary project, the pages were photo-reduced to a 22 x 14 cm format.

Pretest

The questionnaire was pretested with a group of seven respondents. The objectives of the pretest were to: estimate the time required to complete it; detect ambiquities; and to determine that the questions were answerable. The particular responses were not of interest at this time, therefore, a larger sample was not necessary.

It was found that the time required to complete the questionnaire was between fifteen and twenty minutes as anticipated, so no changes in length were required. Suggestions from the respondents prompted a few changes in wording, but no consistent problems were detected and no items were dropped or added. A few final changes in format and in the order of the questions were made to improve the ease and speed of reading for the respondents.

Design Steps to Establish Reliability and Validity

The concepts of reliability and validity refer to the degree to which the measurement instrument is free of measurement error. Validity refers to the degree to which an instrument actually measures what it was designed to measure (Fishbein and Ajzen 1975). With respect to the present study this would refer to the degree to which the instrument measures beliefs about breastfeeding rather than some other variable.

Three types of validity testing were employed. These were: face validity; content validity; and construct validity.

Face Validity

This was the first criterion for selecting items to be included in the index. Face validity is a reflection of the apparent reasonableness and relevance of an item (Babbie 1983). Determining face validity does not require a statistical test but rather is simply the appearance of an item's appropriateness as determined by test subjects and/or researchers.

Estimations of face validity rested upon four criteria: 1) observance of the use of the items or ideas for items in previous research; 2) evaluation of the questionnaire during its development by individuals considered expert in the areas of sociological study and in breastfeeding; 3) comments from pilot study respondents; and 4) comments and suggestions made by respondents in the main survey.

Content Validity

Content validity judges the adequacy of the content of the survey (Cronbach 1970). Specifically, it tests whether the content has been appropriately defined and is fairly represented in the survey.

Assessing content validity requires judging whether each

item and the distribution of items covers what the researcher wanted to measure which, in the present study, is the five general beliefs identified earlier. Two individuals, one currently working on breastfeeding research and the other working on social research were chosen to judge the representativeness of the items in the present investigation.

Construct Validity

Construct validity is the degree to which the test scores can be accounted for by certain explanatory constructs in the theory (Mehrens 1973). When an instrument has construct validity, scores vary between respondents just as the underlying theory would predict. Determining construct validity depends upon the empirical findings. One commonly used method of construct validation is analysis of variance, which is a technique for identifying differences in scores between groups of subjects.

Reliability

The reliability of an instrument generally refers to its ability to yield the same results on different occasions (Fishbein and Ajzen 1975; Carmine and Zeller 1979). This research design did not include a test-retest component, so the assessment of over-time reliability of the research

instrument would require additional research. However, the term reliability is also used in a somewhat different sense to describe whether different measures of the same construct provide similar results. Thus, if five items are determined (by a factor analysis, for example) to be measuring the same general belief, the reliability or "internal consistancy" (Carmine and Zeller 1979) can be measured. The statistic used most frequently for such tests of "inter-item reliability" is Cronbach's alpha, which is calculated from the correlations among the items in question.

Summary of Chapter

Fishbein and Ajzen's model of beliefs, attitudes, intentions and behaviors was instrumental in designing the research instrument used in the present investigation. Initially, a search of the current literature generated five general beliefs that might be held by health professionals. The second step involved generating specific beliefs about breastfeeding which reflected the five initial factors. At that time a number of variables, or characteristics of the individuals and their environment considered relevant to the issue of breastfeeding were also generated. These items were formatted into a questionnaire, which was pretested, revised and distributed.

Design steps for establishing reliability and validity were also discussed. A review of face, content and construct validity was provided.

The manner in which the measurement instrument was utilized in this investigation is presented in Chapter V.

CHAPTER V

METHODOLOGY

Introduction

A description of the methodological techniques used to collect the data and to test the reliability and validity of the instrument used in the present investigation are presented in this chapter.

Data Collection and Coding

The survey methodology often used for descriptive and explanatory investigations is the cross-sectional approach (Babbie 1983) whereby data is collected at one point in time. A limitation of this method is that the conclusions are based on observations made at only one time, however, the phenomenon being examined is often a process which occurred over time. However, inferrences about the processes that occur over time can be made. Fishbein and Ajzen (1975) suggest that it is impossible to obtain a precise measure of an individual's beliefs. The difficulty arises because even the process of eliciting beliefs may produce a change in

their saliency. A rough approximation can be made if the salient beliefs of a representative population are known. The concern of the present investigation is to elicit the salient beliefs of health professionals.

Data was gathered using self-administered questionnaires. As do all survey methods, self-administered questionnaires have a number of limitations. The chief shortcoming is the poor response rate. As discussed in chapter IV, the questionnaire's physical dimensions were reduced to maximize interest. There is also a concern that those who respond are not representative of the original sample drawn, that they responded because they were interested in the topic. It has been suggested that interest indicates a positive attitude (Oppenheim 1966). This limitation must be taken into account when interpreting the data. Generally, the wording on self-administered questionnaires must be kept simple to prevent interpretation problems. However, subjects in the present study were of a select group, and it was assumed the respondents had general knowledge of the medical and nutritional terminology used.

Sampling Design

The unit of analysis for this study was the individual. The general universe to whom the data could theoretically be generalized were health professionals, within Alberta, who

have the potential to be in contact with expectant or new parents.

Subject selection for the survey employed the following steps and criteria. Initially, appropriate officials from the General Hospital, the Charles Campsell Hospital, the Nursing Faculty of the University of Alberta, the Faculty of Health Services Administration and Community Medicine from the University of Alberta, the Edmonton Local Board of Health, the Organization for Nutrition Education (O.N.E.) and the Association for Registered Dieticians in Alberta (A.R.D.A.) were contacted for permission to survey the following health professionals:

1. Maternity ward nursing staff.
2. Nursing students.
3. Practicing medical doctors.
4. Public health nurses.
5. Dieticians.
6. Nutritionists.

Permission was granted for inclusion of the following individuals:

1. Maternity ward nurses in one hospital.
2. One class of nursing students from the University of Alberta and one from a hospital.
3. Members of A.R.D.A.
4. Members of O.N.E.

A.R.D.A. members included all dieticians registered in Alberta in 1982. O.N.E. members were predominantly nutritionists, however, dieticians, teachers and lay persons were also included in the membership.

A systematic sampling method was used on the lists of members of A.R.D.A. and O.N.E. A point on each list was designated by choosing a random number to start, then, every 5th name was included in the sample. The lists were examined for possible recurring patterns which may have led to a biased sample. Ideally, each subject should appear only once in the sample frame so as to ensure equal representation; however, a small number of dieticians were also O.N.E. members. Although none were chosen twice, these individuals had a greater probability of selection which could have lead to overrepresention of dieticians in the sample.

A package containing a cover letter, questionnaire and self-addressed stamped envelope was sent to each of the chosen sample. Each envelope was identified with a code (A for A.R.D.A. members and O for O.N.E. members) to facilitate determining a response rate.

A cluster sampling method was used to survey student nurses. This technique is often employed when an exhaustive list of subjects is impossible or impractical to compose. Already existing sub-populations are sampled instead. Two

nursing-instructors, one from the University of Alberta and the other from the Royal Alexandra Hospital, were approached for permission to survey nursing students attending one of their lectures. Both instructors agreed to allow their classes to participate. The student nurses were surveyed as a group during a twenty minute period at the beginning of a lecture period. The students were not informed about the survey prior to the day they received it.

Cluster sampling is a highly efficient method of sampling, however, it is also a less accurate method. The probability of sampling bias is much higher in cluster sampling which reduces the generalizability of the results to a larger population.

A cluster technique was also used to sample ward nurses, however, the nurses participated in the survey on a voluntary basis. The head nurse on the maternity ward endorsed and distributed the questionnaire to the other nurses. Worchel and Cooper (1979 p.73) indicate that individuals in authority, such as head nurses, are effective persuaders. The nurses were allowed one week to complete and return the questionnaire to a specified collection area.

The various different sampling techniques used in this study could create problems if precise estimates of population parameters were desired. However, this is not the goal of

this study, the goal is to collect information on beliefs and attitudes from a diverse group of health professionals in order to validate a measurement instrument.

Those subjects receiving the mailed questionnaire together with the maternity ward nurses were provided with a cover letter (Appendix A) briefly explaining who was participating in the survey and the time it should take to complete it. This same information was given verbally to the classroom respondents, with no further promptings, so that all respondents were responding to similar stimuli.

Coding of the Data

The data collected were transformed to numerical form and entered onto a computer file. Most items and their scores were pre-coded on the questionnaire. Some items as well as the demographic data, required classification which necessitated manual coding on the questionnaires. For example, question number 73 was an open ended question asking for religious preference: each religious category was alloted a code which was then manually applied to the questionnaire. This job was completed by a volunteer student and the investigator. Discrepancies in definitions of code categories between the coders were tested by each coder rechecking 25% of the cases coded by the other. No discrpancies were detected.

Statistical Techniques Used in Data Analysis

Various processes and statistical techniques were utilized to analyze the data, they included the following.

Pearson Correlation

A pearson correlation coefficient (r) measures the association or strength of the relationship between two variables. It is a measure of the proportion of variance in one variable which can be explained by another variable. If "r" is less than 0.10 the relationship is considered neither empirically nor statistically significant. If greater than 0.70 it is considered to be a strong relationship (Bailey 1982; Kidder 1981). For example, if a consistent pattern was observed whereby older women tended to have a more positive attitude about breastfeeding, a high correlation (e.g. 0.70) would be obtained between age and a measure of this attitude. Pearson correlations were used to measure the strength of the relationships between the factors (general beliefs), overall attitude and an intention item.

Factor Analysis

It is too simplistic to conceive of an attitude toward an issue such as breastfeeding as simply a position on a single continuum of like-dislike. Attitudes toward breastfeeding are complex, there are different facets of liking or

disliking breastfeeding. For example an individual may like its convenience but dislike its lack of social acceptability. This multidimensional conception of attitude is most frequently measured by a multidimensional technique such as factor analysis.

The basic premise of factor analysis is that there are underlying and unobserved variables which presumably "explain" observed items (Kerlinger 1979). For example, the items (specific beliefs): breastmilk doesn't require any special preparations; infants can be fed as soon as they are hungry if they are breastfed; and bottlefeeding requires elaborate sterilization techniques, all have a common theme which reflects "convenience".

Factor analysis is used to discover patterns. The manner in which patterns are distinguished is very complex and must be performed by a computer program (see the SPSS Manual ie et al.). Essentially, the technique generates one or more artificial dimensions, called factors, which are composed of several of the original items which are highly correlated with each other (Babbie 1983). The factors are independent of one another. Factors are theoretical concepts, the only scientific reality they have comes from the correlation coefficients among the items being analyzed. Factor analysis assumes that items with a common theme will be answered similarly. It is a statistical technique which groups

together items which tend to be answered in the same way and show a relationship with each other.

The output of a factor analysis program includes a matrix consisting of columns representing the several factors generated from the observed correlations among the items. These columns contain factor loadings. A factor loading is a coefficient that expresses how much an item is loaded or associated with the factor; the closer a factor loading is to 1.00, the more that item contributes to the factor. Substantial loadings indicate that the items share something in common. A simple correlation matrix would give some of the same information, but the correlations cannot usually be grasped in their totality, while the factors can. Factor loadings are in effect reductions of much more complex data to a more manageable size so that interpretation of the results is easier.

Factor analysis is a method for determining the number of factors or underlying dimensions which are in a set of data, and for ascertaining which items belong to or are associated with whatever the factor is. In the present study this would involve separating the specific beliefs into groups representing general beliefs. The main limitation of the factor-analytic approach is that the emerging dimensions are dependent on the particular set of items used to elicit responses. In short, factor analysis identifies the

underlying dimensions of a given set of items, and not necessarily all relevant dimensions of the concept. Any dimension not represented by a particular set of items cannot be identified; likewise items included on the instrument which do not in reality relate to the concept may be identified in the factors. For example, if an item indicating mathematical ability was included on the instrument, it is possible that a "mathematical ability" factor would be identified. Factor analysis may also be used as a data reduction technique. While identifying groups of items, it can also identify items which should be eliminated from the total set, since they are not systematically related to the other items.

The generation of factors refers only to empirical associations between items, no reference is given to the meaning of the items (Babbie 1983). It is necessary to interpret the separate entity of a given factor on the basis of the variables that load highly on it, but as well the items must be examined as to their face and content validity.

Inter-Item Reliability

Having eliminated the poorer items and identified several clear factors with a factor analysis, the items loading highly on a factor can be combined into an index by averaging the scores. Reliability may be assesed in a number

of ways, "average item-total correlation" was used for the present investigation. Cronbach's alpha coefficient indicates inter-item reliability or internal consistancy within an index (Kidder 1981; Carmine and Zeller 1979). This technique involves removing each item one at a time, correlating it with the total score and averaging those correlation coefficients. This measures how much the answer to each item agrees with the sum of answers to the other items. The coefficient indicates the degree of similarity between the items and is essentially an evaluation of the scale suggested by the factor analysis.

Analysis of Variance

Construct validity is the degree to which the test scores can be accounted for by certain explanatory constructs (Mehrens 1973). Analysis of variance is one method commonly used to determine construct validity. The technique involves combining the cases under study into groups which represent the independent variables and then determining the extent to which the groups differ from one another in terms of a dependent variable (in the present case, an index). Independent variables as they pertain to the present study include age and occupation. Independent variables are presumed to determine the scores on the dependent variables.

Analysis of variance is a statistical technique which

compares, across groups, the average scores or means on the dependent variable index. If a randomly selected sample were used, the significance tests produced in the analysis of variance could be used for making population estimates. However, even if a sample is not randomly selected (as in the present study where population estimates are not the goal), the significance tests will still be useful for looking at the magnitude of differences between groups, which is what construct validity addresses.

Summary of Chapter

A common method of data collection, self-administered questionnaires, was utilized; three methods of distribution were employed which coincided with sample design. Maternity ward nurses from one metropolitan hospital, two classes of student nurses and randomly sampled members of A.R.D.A. and O.N.E. received questionnaires.

Appropriate statistical models were chosen to assess the responses of subjects. These were factor analysis, Cronbach's alpha, analysis of variance and Pearson's correlation. A discussion of the results and interpretation of the analyses is provided in chapter VI.

CHAPTER VI

RESULTS AND DISCUSSION

Introduction

Multiple indicators of five hypothesized beliefs regarding breastfeeding were measured and analyzed by factor analysis. Three of the original five beliefs were confirmed by the analysis. The results are presented in a fashion which focuses on the reliability and validity of the research instrument.

Response Rate

A total of 229 questionnaires were distributed and 167 (73%) were completed and returned (Figure B.1, Appendix B). The response rate was 57 percent (28/49) from the A.R.D.A. mailing list and 67 percent (18/27) from the O.N.E. mailing list. Thirty questionnaires were distributed to the ward nurses, 12 (40%) were completed and returned, 13 were uncompleted and 5 were not returned. One hundred and six student nurses were surveyed. One public health nurse

responded through the O.N.E. returns. Because public health nurses were not included as a group in the study sample, she was categorized as "other". Three other respondents also did not fit into the specified categories, they included teachers and were also included in the "other" frequency.

The response rate achieved with a mail questionnaire is generally poor (Babbie 1983). Babbie (1983) indicates that a 50% response rate is adequate for analysis and reporting, 60% is good and 70% is very good.

A strict probability sample was not a priority as already mentioned. The concern of the present research was not to generalize to a larger population, but rather to develop a research instrument which would allow such generalizations. Therefore, the emphasis was on obtaining a sample of health professionals and determining whether their beliefs about breastfeeding could be identified parsimoniously and objectively. The second concern pertained to the practical usefulness of the instrument; would it differentiate between respondents. To this end it was necessary to have a mixed group of respondents, ie various ages, occupations, personal characteristics and environmental characteristics.

Description of Sample

Some of the more diverse frequency distributions for the

sample structure are presented in in Appendix B. The majority of respondents, 65 percent (108) had between one and four years of post-secondary education, reflecting the high percentage of students. The mean number of years of post-secondary education was four (Figure B.2).

The frequency distribution of respondents by age is given in Figure B.3. The age of respondents ranged from nineteen to fifty-six years. Two respondents did not give their age. The largest group of respondents (38%) were between nineteen and twenty-one.

The majority of respondents, 120 (72%), were not parents. Four did not respond to this question.

Eight-five respondents (52%) were breastfed themselves, twenty-one (13%) did not know, and four (2%) individuals did not respond to this question.

Most respondents, 92 (55%) grew up in Alberta. Twenty-seven (16%) respondents were from British Columbia, Saskatchewan or Manitoba. Ten (6%) originated from points scattered across the remainder of Canada and four (2%) were raised outside Canada

A summary of the respondents' seniority status within their positions and their professions appears in Figures B.4 and

B.5 respectively. This question did not apply to 91 (55%) respondents, the majority. Thirty-three (20%) respondents had been in their profession from four to twelve years, twenty-one (13%) for over thirteen years and 15 (9%) for one to three years. Seven (3%) respondents did not respond to the question. Sixty-five (39%) of the sample were presently working; the majority of these individuals 33 (51%), had worked at the same job for between two and five years. Sixteen individuals had been working only one year. The range of years respondents had been at the same job was from one to thirty-one years.

Seventy-two (43%) of the sample saw clients; this question did not apply to the majority of respondents. Figure B.6 summarizes the number of clients the respondents saw in one day. The range of clients the respondents saw between one and greater that one-hundred. Twenty-nine (40%) of those respondents seeing clients, saw between one and nine clients per day.

Most, 89% (148), of the sample had friends who had breastfed, only one individual said she had not. Eight respondents did not know if their friends had breastfed and nine did not respond.

Face Validity and Content Validity

Face and content validity were important aspects of the instrument development. Although they do have some merit in validating the statistical results, their contribution is subjective and non-statistical.

Face validity is a subjective estimation of the apparent reasonableness and relevance of an item. The comments and suggestions of the seven individuals who completed the pretest indicated that the items appeared reasonable and relevant to the stated purpose in the questionnaire. A few suggestions led to minor changes in wording to enhance the clarity of the items in the final draft.

[redacted]ments and suggestions received from respondents participating in the main investigation also indicated that most items presented no difficulty. No particular item showed consistent problems.

Content validity indicates whether the content areas (in the present study, the five general beliefs) have been appropriately defined and fairly represented in the survey. It is usually evaluated subjectively by individuals considered expert in the area. Previous to the distribution of the main survey, individuals considered expert in the area of breastfeeding and social research had indicated their satisfaction with the representativeness of the items.

Results of Statistical Analyses

The primary purpose in this investigation was to develop an instrument which would distinguish between individuals with different attitudes toward breastfeeding. The focus of the results presentation will be on the statistical technique, factor analysis, which was used to reduce the fifty-four specific beliefs about breastfeeding into a smaller number of reliable belief indices. A discussion of inter-item reliability and construct validity of the resulting indices will follow.

Factor Analysis

The factor analysis solution for the results obtained in the present study supported the contention that multiple indicators of the issue of breastfeeding did separate into dimensions or general beliefs. Although five beliefs about breastfeeding were hypothesized, only three beliefs were confirmed by the research on this particular sample.

Scores from the 161 respondents who had answered all items were analyzed by employing an orthoganol varimax solution(1). Interpretations were made from the factor loadings in the rotated factor matrix. The initial factor

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(1)This is the most commonly used type of factor analysis. For a discussion see Rummel 1967)

analysis of all fifty-four items yielded fifteen factors. Many items appeared in more than one factor and/or had very low factor loadings (below 0.3). Examination of these items revealed that some contained multiple stimuli, some were ambiguously worded, and still others had very little variation in response. These items were removed, one or two at a time, as a series of factor analyses were performed to reduce the fifty-four original items to a manageable and clean set of fewer items.

A final varimax solution was obtained with thirteen items forming three distinct factors (Table 6.1). These three factors explained 57.9% of the total variance (2). Items with loadings greater than 0.5 under one factor are grouped together. Table 6.1 shows how the groups of items clustered to form factors. An examination of the statements with the highest loadings suggested factor names which described the beliefs each factor appeared to be measuring. In order of variance explained, the factors were labeled: "nutritional superiority"; "moral responsibility"; and "public acceptability".

(2)Total variance measures the regularity in the data (Rummel 1967), which means there is a 57.9% probability of correctly reproducing the answers of an individual for the 13 items by knowing the individuals scores on the 3 factors.

TABLE 6.1: RESULTS OF FACTOR ANALYSIS: Factor Loading Matrix

Factor and Item (Item No. on Survey)	Factor Loadings on Factors: 1	2	3	Communality
1.Nutritional Superiority				
Breastfeeding mothers are providing the best food an infant can get. (Item 24)	.81	.17	.03	.69
Breastfeeding provides optimal nutrition. (Item 28)	.85	.09	.06	.74
Scientific progress has resulted in formula milk that is nutritionally better than breastmilk.* (Item 42)	.74	.03	.24	.60
Breastmilk is the best food for an infant. (Item 55)	.81	.20	.11	.72
2.Moral Responsibility				
All mothers who are able should breastfeed their babies. (Item 10)	.30	.56	.05	.41
Mothers feel much closer to their babies if they breast-feed. (Item 17)	.16	.65	.05	.45
Babies prefer the breast to the bottle. (Item 23)	.07	.60	.07	.37
Bottlefeeding is an unnatural method of feeding a child. (Item 34)	.01	.71	.05	.51
Breastfeeding mothers are usually women who lead a more natural life. (Item 39)	.06	.55	.01	.30
To be breastfed is a child's birth right. (Item 57)	.06	.67	.18	.48

(continued on following page)

* Item was recoded, disagreeing with the statement indicated more positiveness toward breastfeeding.

TABLE 6.1: RESULTS OF FACTOR ANALYSIS: Factor Loading Matrix (continued)

Factor and Item (Item No. on Survey)	Factor Loadings on Factors: 1	2	3	Communality
3. Public Acceptability				
I would be embarrassed to see a woman breastfeeding in public.* (Item 41)	.11	.03	.85	.74
Breastfeeding in front of mixed company is acceptable. (Item 51	.13	.08	.86	.76
Mothers should not breast-feed in public.* (Item 56)	.11	.07	.86	.75
% Variance Explained	29.1	15.6	13.2	
Cumulative % Variance Explained	29.1	44.7	57.9	

* Item was recoded, disagreeing with the statement indicated more positiveness toward breastfeeding.

Underlying Dimensions Revealed by Factor Analysis

The first factor, "nutritional superiority" was composed of four items which pertained to 'nutrition' and to breastmilk as a 'best food'. The factor loadings for these items were greater than 0.7 under factor 1, indicating a high degree of shared variance. Two of the items (numbers 24 and 55) were slight variations of the same theme, "breastmilk is a best food". The items under this factor did not cover as wide a field as did the items within Martin's (1978) "breastfeeding is best" dimension, rather they were restricted to the general nutritional aspect.

Six items with high factor loadings under factor 2 were labeled, "moral responsibility". The items within this factor appeared to tap a sense of the "rights" and "wrongs" of infant feeding conduct. Items 34 and 39 reflected beliefs that breastfeeding is "natural". Items 17 and 23 described breastfeeding as the method preferred by both mothers and infants. Items 10 and 57 referred to breastfeeding as a mothers "responsibility" to her child. The loadings indicated the items are highly correlated and thus are probably measuring the same attribute.

The third factor was labeled "public acceptability". The content common to the three items loading high on factor 3, dealt with the socially acceptable or unacceptable situations in which to breastfeed. The factor loadings for

these items were high indicating that they were good multiple indicators of the "public acceptability" belief.

For each of the three factors, an index was created by averaging scores on the highly-loading items for that factor. Thus, for the "nutritional superiority' index four items were averaged, while six items and three items formed the other two indices. Finally, to provide an approximation of an overall "attitude toward breastfeeding" measure, a fourth index was created by averaging the scores on the other three indices.

Establishment of Inter-Item Reliability

Cronbach's alphas were calculated for each of the belief indices and for the "attitude" index. (Tables 6.2-6.5.) The alpha coefficient for the factors "nutritional superiority" and "public acceptability" was 0.84 for each. The coefficient was 0.70 for the factor "moral responsibility". All of these are considered acceptable in terms of inter-item reliability (Carmine and Zeller 1979). Hence, these indices appear to be reliable measures.

The reliability coefficient for the overall "attitude" index was 0.48. This is as expected; the low alpha indicating that the indices were not highly correlated among themselves (Table 6.5). The reliability coefficient is above zero

TABLE 6.2: RELIABILITY (ALPHA COEFFICIENT)

CORRELATION MATRIX: FACTOR 1 "Nutritional Superiority"

	Item	I	II	III	IV
I	Breastfeeding mothers are providing the best food an infant can get.	1.00			
II	Breastfeeding provides optimal nutrition.	.64	1.00		
III	Scientific progress has resulted in formula milk that is nutritionally better than breastmilk.	.48	.52	1.00	
IV	Breastmilk is the best food for an infant.	.58	.64	.55	1.00

ALPHA = .84
NUMBER OF CASES= 161

TABLE 6.3: RELIABILITY (ALPHA COEFFICIENT)

CORRELATION MATRIX: FACTOR 2 "Moral Responsibility"

	Item	I	II	III	IV	V	VI
I	All mothers who are able should breastfeed their babies.	1.00					
II	Mothers feel much closer to their babies if they breast-feed.	.30	1.00				
III	Babies prefer the breast to the bottle.	.23	.33	1.00			
IV	Bottlefeeding is an unnatural method of feeding a child.	.32	.28	.30	1.00		
V	Breastfeeding mothers are usually women who lead a more natural life.	.26	.21	.24	.29	1.00	
VI	To be breastfed is a child's birth right.	.29	.36	.25	.42	.21	1.00

ALPHA = .70
NUMBER OF CASES= 161

TABLE 6.4: RELIABILITY (ALPHA COEFFICIENT)

CORRELATION MATRIX: FACTOR 3 "Public Acceptability"

	Item	I	II	III
I	I would be embarrassed to see a woman breastfeeding in public.	1.00		
II	Breastfeeding in front of mixed company is acceptable.	.63	1.00	
III	Mothers should not breast-feed in public.	.62	.66	1.00

ALPHA = .84
NUMBER OF CASES= 161

TABLE 6.5: RELIABILITY (ALPHA COEFFICIENT)

CORRELATION MATRIX: "ATTITUDE"*

Factor	I	II	III
I Nutritional Superiority	1.00		
II Public Acceptability	.28	1.00	
III Moral Responsibility	.31	.15	1.00

ALPHA = .48
NUMBER OF CASES= 161

* Combined scores from the 3 factors ((Nutritional Superiority)), ((Public Acceptance)), and ((Moral Responsibility))

however, which indicates some degree of similarity, ie all the indices were reflecting some aspect of breastfeeding. This is consistant with Fishbein and Ajzen's general theory that attitudes have a number of underlying dimensions.

Pearson Correlations

Table 6.6 is a correlation coefficient matrix representing correlations among the three general belief indices, the "attitude" index and an intentions variable, which pertained to a personal intention to breastfeed a child born within the next year. The results among the belief indices are, of course, similar to those obtained using Cronbach's alpha in Table 6.5 (the correlations differ slightly because the N is smaller in Table 6.5). Of particular interest in this table is the effects of the "attitude" index and the three belief indices on the intention variable.

Pearson correlations measure the strength of the relationship between two variables. To obtain a percent measure of the total variation of one variable that is explained by the other, it is necessary to square the correlation coefficient. For example, the pearsons correlation coefficient between nutritional superiority and "attitude" is 0.73. This measure suggests that 53 % of the variation in attitude is the result of a belief in

TABLE 6.6: PEARSON CORRELATION COEFFICIENTS FOR, INDICES, ATTITUDES AND INTENTIONS

	NUTRITIONAL SUPERIORITY	PUBLIC ACCEPT.	MORAL CONSID.	ATTITUDE	INTENTION
NUTRITIONAL SUPERIORITY	1.00 (0) P=	.28 (161) P=.00	.32 (162) P=.00	.73 (161) P=.00	.52 (158) P=.00
PUBLIC ACCEPTABILITY		1.00 (0) P=	.17 (162) P=.02	.74 (161) P=.00	.30 (158) P=.00
MORAL CONSIDERATION			1.00 (0) P=	.64 (161) P=.00	.19 (159) P=.01
ATTITUDE				1.00 (0) P=	.46 (157) P=.00
INTENTIONS					1.00 (0) P=

(a)Parentheses contain sub-sample sizes.
p = significance (nothing is printed if a coefficient cannot be computed)

breastfeeding's nutritional superiority. However, because the belief indices compose the "attitude" index, a high correlation between them is expected.

Of more interest are the moderate relationships between nutritional superiority and intentions to breastfeed and between attitude and intentions. Fishbein and Ajzen's (1975) conceptual model clearly states that "sets" of beliefs or intentions may be used to infer attitude. One item is not an accurate indicator. The model also states that attitudes in conjunction with normative beliefs influence intentions. The results between attitude and intentions indicate a positive correlation of moderate strength (0.46). The differences among respondents in attitude seems to explain part (21%) of their differences in intentions to breastfeed. The remaining 79% of unexplained variance indicates the influence of some other variable(s), possibly normative beliefs and/or situational variables.

Also of interest were the correlation coefficients obtained between the belief variables and intentions. The differences between respondents in their beliefs pertaining to the "nutritional superiority" of breastfeeding explains 27% of the differences in intentions to breastfeed. The other two beliefs "moral consideration" and "public acceptability" explain nine and four per cent, respectively, of the differences in intentions to breastfeed. Fishbein and

Ajzen's model indicates that beliefs and intentions are not directly related. Further multivariate analysis of these data might reveal an indirect effect of beliefs on intentions via attitudes.

Establishment of Construct Validity

The previous discussion established that specific beliefs from the original questionnaire could be separated into dimensions reflecting a smaller number of general beliefs. The final assessment of the instrument was made on the basis of construct validity. The question now addressed: "Is the attitude-assessing instrument useful?" ie does it distinguish between respondents?

An index is considered to have construct validity if it distinguishes between groups in a predicted manner. For example, are more highly educated women more likely to believe that breastmilk is more nutritious, as other research has shown. As shown in Tables 6.7-6.10 the results of the analysis of variance indicate an adequate degree of construct validity. Tables 6.7 and 6.8 first look at the belief indices by personal and environmental characteristics. Although not all sub-groups of respondents differed significantly on all dependent variables, there were enough differences in the predicted direction, to warrant the conclusion that these indices and the larger

TABLE 6.7: ANALYSIS OF VARIANCE RESULTS: INDEX SCORES BY PERSONAL CHARACTERISTICS

PERSONAL CHARACTERISTICS	AVERAGE SCORES (a) NUTRITIONAL SUPERIORITY	PUBLIC ACCEPTANCE	MORAL RESPONSIBILITY
Age:	*	*	*
19-21 yrs.	3.96 (63)(b)	3.35 (62)	3.03 (63)
22-29 yrs.	4.34 (48)	3.81 (49)	3.28 (49)
>29 yrs.	4.34 (49)	3.42 (49)	3.34 (49)
Parents:	*	Not sig.	*
Yes	4.40 (43)	3.62 (43)	3.36 (43)
No	4.13 (116)	3.45 (116)	3.13 (117)
Years of Post-Secondary Education:	*	Not sig.	Not sig.
1-4 yrs.	4.06 (106)	3.43 (106)	3.15 (107)
>4 yrs.	4.45 (56)	3.63 (56)	3.28 (56)
Occupation:	*	Not sig.	+
Student Nurse	4.03 (100)	3.47 (100)	3.09 (101)
Ward Nurse	4.38 (12)	3.52 (12)	3.31 (12)
Dietician	4.48 (41)	3.55 (41)	3.43 (41)
Nutritionist	4.63 (8)	3.72 (8)	3.15 (8)
Opinion on Convenience:	*	*	Not sig.
Convenient	4.52 (108)	3.93 (108)	3.41 (108)
No opinion	4.14 (40)	3.41 (40)	3.15 (40)
Inconvenient	3.75 (13)	2.90 (13)	3.04 (13)
Personal intentions to breastfeed:	*	*	+
Strongly agree	4.45 (98)	3.71 (98)	3.25 (99)
Agree	3.88 (40)	3.28 (40)	3.14 (40)
Neutral	3.43 (10)	3.03 (10)	3.13 (10)
Disagree	3.48 (10)	3.00 (10)	2.80 (10)
Professional intentions to promote:	*	Not sig	*
Breastfeeding	4.45 (46)	3.61 (47)	3.40 (47)
Bottlefeeding	4.50 (4)	3.92 (4)	3.96 (4)
Let mother choose	4.07 (110)	3.43 (110)	3.09 (111)

(a)Means from the ((strongly agree (1) - (5) strongly disagree)) answers.
(b)Parentheses contain sub-sample sizes.
* denote statistically significant differences ($p<.05$).
+ denote statistically significant differences ($p<.10$).

TABLE 6.8: ANALYSIS OF VARIANCE RESULTS: INDEX SCORES BY ENVIRONMENTAL CHARACTERISTICS

ENVIRONMENTAL CHARACTERISTICS	AVERAGE SCORES (a) NUTRITIONAL SUPERIORITY	PUBLIC ACCEPTANCE	MORAL RESPONSIBILITY
Seniority within job:	+	Not sig.	Not sig.
1 yr.	4.37 (15)	3.50 (16)	3.32 (16)
2-5 yrs	4.54 (35)	3.72 (35)	3.32 (35)
>5 yrs.	4.34 (16)	3.44 (16)	3.36 (16)
Seniority in profession:	Not sig.	*	+
1-3 yrs.	4.42 (15)	3.84 (15)	3.12 (15)
4-12 yrs.	4.49 (34)	3.75 (35)	3.49 (35)
>13 yrs.	4.31 (21)	3.14 (21)	3.23 (21)
Time schedule-busy:	*	Not sig.	*
Agree	4.16 (17)	3.31 (17)	3.09 (16)
Neutral	4.42 (13)	3.84 (13)	3.29 (13)
Disagree	4.45 (48)	3.60 (48)	3.30 (48)
Regional origin:	Not sig.	Not sig.	Not sig.
Alta.	4.08 (90)	3.51 (89)	3.24 (90)
Rest of prairies	4.34 (26)	3.49 (27)	3.17 (27)
East	4.35 (27)	3.57 (27)	3.03 (27)
Out of Canada	4.56 (4)	3.17 (4)	3.04 (4)
Clients in one day:	Not sig.	Not sig.	Not sig.
1-9	4.32 (27)	3.54 (27)	3.27 (27)
10-13	4.27 (16)	3.63 (16)	3.15 (16)
>13	4.55 (28)	3.65 (28)	3.26 (28)
If breastfed as an infant:	*	*	*
Yes	4.30 (83)	3.40 (84)	3.32 (84)
No	4.18 (58)	3.73 (57)	3.09 (58)
Don't know	3.84 (18)	3.20 (18)	2.98 (18)
Friends who have breastfed:	Not sig.	Not sig.	Not sig.
Yes	4.23 (146)	3.53 (146)	3.21 (147)
No and Don't know	3.88 (16)	3.25 (16)	3.08 (16)

(a)Means from the ((strongly agree (1) - (5) strongly disagree)) answers.
(b)Parentheses contain sub-sample sizes.
* denote statistically significant differences ($p<.05$).
+ denote statistically significant differences ($p<.10$).

TABLE 6.9: ANALYSIS OF VARIANCE RESULTS: SCORES FROM "ATTITUDE" INDEX BY PERSONAL CHARACTERISTICS

CHARACTERISTIC	HYPOTHESIS	ATTITUDE(a)	
Age:	With increased		
19-21 yrs.	age should find	3.44	(62)(b)
22-29 yrs.	less positive	3.80	(48)
>29 yrs.	attitude.	3.70	(49)
Parents:	Exploratory.	*	
Yes		3.79	(43)
No		3.56	(115)
Years of Secondary Education:	With more education		
1-4 yrs.	should find more	*	
>4 yrs.	positive attitude.	3.54	(105)
		3.79	(56)
Occupation:	Students should	*	
Student Nurse	have more positive	3.52	(99)
Ward Nurse	attitudes.	3.74	(12)
Dietician		3.82	(41)
Nutritionist		3.84	(8)
Opinion on Convenience:	A more conven-	*	
Convenient	ient opinion	3.87	(40)
No opinion	should indicate	3.50	(107)
InConvenient	a more positive attitude.	3.22	(13)
Personal intentions to breastfeed:	More favorable intentions should	*	
Strongly agree	indicate more	3.80	(97)
Agree	positive attitudes.	3.43	(40)
Neutral		3.20	(10)
Disagree		3.09	(10)
Professional intentions to promote:	More favorable intentions should	*	
Breastfeeding	indicate more	3.80	(46)
Bottlefeeding	positive attitudes.	4.13	(4)
Let mother choose		3.53	(110)

(a)Means from the <<strongly agree (1) - (5) strongly disagree>> answers.
(b)Parentheses contain sub-sample sizes.
* denote statistically significant differences (p<.05).

TABLE 6.10: ANALYSIS OF VARIANCE RESULTS: SCORES FROM "ATTITUDE" INDEX BY ENVIRONMENTAL CHARACTERISTICS

CHARACTERISTIC	HYPOTHESIS	ATTITUDE(a)
Seniority within job:	With increased	not sig.
1 yr.	experience should	3.68 (15)
2-5 yrs	find less positive	3.86 (35)
>5 yrs.	attitude.	3.72 (16)
Seniority in profession:	With increased	*
1-3 yrs.	experience should	3.79 (15)
4-12 yrs.	find less positive	3.89 (34)
>13 yrs.	attitude.	3.56 (21)
Time schedule-busy:	Exploratory.	
Agree		3.52 (17)
Neutral		3.85 (13)
Disagree		3.78 (48)
Clients in one day:	Exploratory.	Not sig.
1-9		3.71 (27)
10-13		3.68 (16)
>13		3.82 (28)
Geographical Origin:	Exploratory.	Not sig.
Alta.		3.61 (89)
Rest of prairies		3.64 (26)
East		3.65 (27)
Out of Canada		3.59 (4)
If breastfed as an infant:	Those who were breastfed will	*
Yes	have a more	3.66 (83)
No	positive attitude.	3.66 (57)
Don't know		3.34 (18)
Friends who have breastfed:	Exploratory.	
Yes		Not sig.
No, Don't know		3.63 (145)
		3.03 (16)

(a)Means from the ((strongly agree (1) - (5) strongly disagree)) answers.
(b)Parentheses contain sub-sample sizes.
* denote statistically significant differences ($p<.05$).

"attitude" measure (Tables 6.9 and 6.10) have construct validity. While significance tests are technically not appropriate given the non-random sample (see Chapter IV Sample Design), they still serve as an indicator of the magnitude of differences between groups. Hence, a significance level of $p<.05$ is used only as a guide for determining whether the differences between groups are large enough for it to be said that the index has construct validity.

Consider first the differences by age for the three factors "nutritional superiority", "moral responsibility" and "public acceptance" and the "attitude" index. Tables 6.7 and 6.9 indicate that the differences in means were significant at the .05 level for all dependent variables. The younger age group, 19-21 yrs, had the least favorable beliefs and attitude toward breastfeeding. This group had the lowest means on all the dependent variables. Means increased with age under the factor "moral responsibility" and the 22-29 year olds had the highest means under "public acceptability" and on the "attitude" index. The results indicate that differences among respondents in age explain part of their differences in beliefs about, and in their attitude toward, breastfeeding. It is quite likely that this group is composed mostly of student nurses, of whom most have probably not started families of their own. Perhaps differences in age reflect systematic differences in

"parental experience". If this argument were true, then it should be the case that with "parental experience" taken into account, the relationships between age and beliefs and attitude would diminish.

Indeed, the results indicate (Tables 6.7 and 6.9) that parental experience does explain part of the differences in beliefs and attitudes. Those respondents who are parents have higher scores on all the dependent variables. Under "public acceptance" the differences between the means were not significant at the 0.05 level. However, they were in the predicted direction. It has been assumed in other studies that breastfeeding experience indicates a positive attitude. However, it is difficult to establish a direct relationship in the present study because although it was determined how many of the children belonging to the respondents were breastfed, the questionnaire did not ask how long each child was fed, whether the breastfeeding experience was successful, or what the respondents definition of "successful breastfeeding" was.

The instrument was able to distinguish between respondents with less than or, greater than four years of post-secondary education on the basis of the average scores from each of the dependent variables. The differences were in the predicted direction for all indices; as education increased so did the favorableness toward breastfeeding. On the two

indices "public acceptance" and "moral responsibility" however, the differences were not statistically significant though in the predicted direction. The means on the "nutritional superiority" factor were both very high, indicating a strong belief in the 'nutritional' value of breastfeeding. Respondents with more than four years post-secondary education had higher means on both "nutritional superiority" and on the "attitude" index. As in the previous discussion pertaining to age, it is quite possible that differences in education are not directly "influencing" beliefs or attitudes. Differences in years of education might reflect systematic differences in age, which in turn are more likely linked to parental experience (3).

The instrument differentiated between respondents in different occupations on two of the four dependent variables, the "nutritional superiority" and the "attitude" indices. Nutritionists had the highest means on both "nutritional superiority" and on the "attitude" index followed by dieticians, ward nurses and student nurses who had the lowest means. This trend is as expected: nutritionists and dieticians are intimately familiar with the nutritional aspects of breastmilk and are more likely to have stronger beliefs. Student nurses scored the lowest on all the indices.

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(3)To test this argument it is necessary to use some multivariate technique such as two-way analysis of variance or multiple-regression.

The instrument also differentiated between respondents who differed in their beliefs concerning the convenience of breastfeeding. The question on the survey asked the respondents to rate the convenience of breastfeeding and check off their answers from five choices: very convenient, convenient, inconvenient, very inconvenient and no opinion. Respondents who felt breastfeeding was convenient had the highest means on all the dependent variables.

Individuals who differed in their intentions to breastfeed were also differentiated by the instrument. Respondents who "strongly agreed" they intended to breastfeed had the highest means on all the indices (this same relationship was observed previously in the section on Pearson Correlations).

Respondents differing in their perceived time schedules were also differentiated by the instrument. Respondents who agreed their schedules were too busy had the lowest means on all the variables. Individuals who disagreed that they were too busy had the highest means under "nutritional superiority" and "moral responsibility" and respondents who were neutral in their opinion had the highest scores under "attitude" and "public acceptability". No discernable pattern was derived from these results. This is likely a more complex dimension than simply time schedules and requires examination from a broader perspective than was given it in the present study. However, the results did lend

themselves positively to the process of establising construct validity for the instrument.

The instrument differentiated between respondents who "were, were not or didn't know if they were, breastfed, on all variables. Those who said yes had the highest means under "nutritional superiority" and "moral responsibility" and shared the highest mean with those who said no on the "attitude" index. Respondents who didn't know, had the lowest means.

Individuals who differed in their professional intentions (to promote breastfeeding, bottlefeeding or let the mother choose) also were differentiated by the instrument. Interestingly, those intending to promote bottlefeeding had the highest means on all the dependent variables although the differences were not statistically significant under the factor "public acceptance". This seems to be a contradiction. However, Fishbein and Ajzen's (1975) theory indicates that attitudes influence "sets" of intentions and not any particular intention. It is quite plausible that the respondents could have positive beliefs and attitudes toward breastfeeding and yet intend to support bottlefeeding. These results support empirically the contentions of a number of authors. It is well known that health professionals are aware of the numerous advantages of breastfeeding; yet their behaviors do not encourage breastfeeding.

The instrument did not differentiate significantly on any of the indices between respondents on the following variables: "geographical origin", "the number of clients they saw in one day" "friends who have breastfed" and "seniority within their jobs" (Tables 6.8 and 6.10). Although these variables did not differ significantly there are some plausible explanations why they did not.

The categories created under geographical origin were likely too crude. Most respondents were from Alberta; very few were from other regions. In order to achieve reasonable numbers of cases within each category it was necessary to group the regions into crude categories which covered large areas. It is also possible that where respondents are presently residing has a greater influence on beliefs and attitudes than where they grew up.

Regarding clients that were seen in one day, it is possible that the categories covered very broad areas. For example, it is possible that respondents seeing 1-9 clients included busy nutritionists, not-busy dieticians and not-busy ward nurses, and respondents seeing more than 13 clients included busy nutritionists, busy dieticians and busy ward nurses. The categories used combined too many individuals who differed with respect to too many characteristics.

Although differences between responses in the environmental characteristic "friends who have breastfed" were not statistically significant, the differences were still in the predicted direction; those who had friends who had breastfed, had more positive attitudes. The number of respondents who did not have friends, or did not know if their friends had breastfed, only totaled 16 versus 146 for the first category. Low case numbers may have influenced the lack of significance.

Thus, except for the independent variables, mentioned above, the instrument was assessed as useful in differentiating between respondents.

Summary of Chapter

Chapter VI presented the results and interpretations of the data analyses. A series of factor analysis solutions were performed in order to reduce the fifty-four original specific belief items from the survey into a smaller number of reliable belief indices. The belief indices were labeled "nutritional superiority", "moral responsiblity" and "public acceptability". High alpha coefficents indicated the thirteen items which composed the three belief indices were appropriate multiple indicators. An overall "attitude" index was calculated from the means of the three belief indices.

The statistical technique, analysis of variance, was used to determined the utility of the instrument in differentiating between respondents in a predicted manner. Also discussed were possible causal relationships between personal and environmental characteristics and the scores obtained on the four indices.

Chapter VII provides a summary of this investigation along with an interpretation of the findings. Recommendations specific to future research are suggested.

CHAPTER VII

CONCLUSIONS AND IMPLICATIONS

Concern has been expressed by several authors who suggest that although most health professionals are aware of the many advantages of breastfeeding, they don't appear to be converting this knowledge into practice. Research indicates that many health professionals have failed to provide information about, and support for breastfeeding. Consequently, a growing number of recommendations have been made which call for a change in attitudes of health professionals as they pertain to breastfeeding. However, the relative importance of health professionals' attitudes on breastfeeding success has not been adequately addressed; objective measures of health professionals' attitudes toward breastfeeding are not available. The major objectives of the present investigation were to develop and test the utility of an instrument which could be used to measure health professionals' attitudes toward breastfeeding.

A conceptual model of beliefs, attitudes, intentions and behaviors proposed by Fishbein and Ajzen (1975) was used as the theoretical framework for the present study. The thrust

of the model was that clear definitional distinctions should be maintained between the constructs composing the model and that the manner in which the constructs were related should be given special attention. On the basis of this model, an instrument was designed to elicit beliefs that health professionals have about breastfeeding. The utility of the instrument was established by testing its ability to distinguish between groups of respondents in a direction that the literature or other research would predict.

The original survey consisted of fifty-four indicators of five general beliefs regarding breastfeeding. A series of factor analyses were performed on the data to reduce the fifty-four items into a smaller number of belief indices. Thirteen of the original items were retained and formed three general belief indices which were labeled, "nutritional superiority", "moral responsibility" and "public acceptance".

The belief index labeled "nutritional superiority" was composed of four items which reflected general beliefs about the nutritional adequacy of breast or bottlefeeding. It is not surprising that health professionals have identifiable beliefs regarding the nutritional superiority of breastfeeding as the nutritional aspect is well-documented in the literature. Reliability and validity testing of this index indicated that it was clearly measuring a general

belief about the nutrition of breastmilk. The four items composing the index could be used in future studies wishing to cover this aspect of breastfeeding beliefs. Future research might consider combining this index with an instrument measuring specific nutrition knowledge as it relates to breastmilk. In this way an assessment of the magnitude of the word "superior" could be made, ie do health professionals believe breastmilk is superior because they have knowledge of its uniqueness? Or, do they feel breastmilk is superior, but their knowledge of the qualities of breastmilk versus formula lead them to conclude that the differences are insignificant.

The second belief index "moral responsibility" reflected what the literature terms, a "romanticized" view of breastfeeding. The items composing this factor related to beliefs that breastfeeding is a "natural act", that it is instinctive and that all mothers should breastfeed their children. Embodied in the items forming this index is a sense that "all good mothers breastfeed"; that mothers have a "moral responsibility" to breastfeed. However, breastfeeding is not instinctive; it is a learned art, and many mothers encounter numerous difficulties which require guidance and support to overcome. It has been suggested that when mothers hold this belief, it is likely to result in inflated expectations of their abilities (Blachman 1981). It is possible that health professionals who also believe in

the "naturalness" of breastfeeding, might also have inflated expectations of the breastfeeding process and as a consequence, set impossible standards for their clients. Hypothetically then, a mother who is experiencing difficulties in performing such a "natural" act, might be considered to be simply lacking in motivation (Applebaum 1975). Treatment of individuals lacking in "motivation" could conceivably differ from that given to mothers not experiencing problems with breastfeeding. For the purposes of this study high scores on this belief index were considered to contribute positively to breastfeeding attitudes as there is no reason to believe that the attributes elicited could be evaluated negatively. Reliability and validity tests indicated that the index was a good measure of the "moral responsibility" belief associated with breastfeeding. However, most mothers experience some breastfeeding problems (West 1980; Evans et al. 1969). Future research might consider using this index in conjuction with measures of beliefs health professionals have toward patients.

The third index was labeled "public acceptability" and was composed of three items reflecting social norms as they apply to breastfeeding. Believing that society accepts breastfeeding in public, was considered to have a positive effect on attitudes toward breastfeeding. As with the other two indices previously mentioned, the reliability and

validity tests indicated that the "public acceptability" index was a good measurement scale of this particular belief as it related to the sample. It is interesting however, that the literature often evaluates social norms as being unsupportive of breastfeeding (Avery 1977; Blachman 1981; Black 1977). It is possible that the uniqueness of the sample might have influenced the outcome of this index; amongst other unique qualities, all respondents were female and most were students. Future research might consider using this index on individuals from different socio-economic stratas and on male health professionals.

The original questionnaire was built upon the hypothesis that there were five general beliefs health professionals might have about breastfeeding. The factor analysis identified only three of these general beliefs. The hypothesized general beliefs about "distaste" and "convenience" were not isolated by factor analysis. Martin's (1978) study of mothers' attitudes did clearly identify these two dimensions. It is possible that health professionals do hold these beliefs; limitations associated with this investigation may be responsible for them not being empirically isolated.

A major limitation of the factor analysis technique is that the emerging dimensions are dependent upon the particular set of items used to elicit responses. Therefore, if the

dimension is not represented by a particular set of items it cannot be identified. A number of items, which on face value appeared to reflect beliefs of "convenience" and "distaste" about breastfeeding, were included on the questionnaire. However, it is possible that the items chosen were not representative of the beliefs as they applied to the particular sample in this investigation. For instance, the multiple indicators of the "convenience" belief were borrowed from Martin's study (1978) and were worded to reflect a mother's impression of the convenience of breastfeeding. It is possible that health professionals consider breastfeeding in terms of "convenient to teach", rather than as a convenient method of feeding an infant. The items included on the questionnaire did not tap this aspect of convenience. Future research instruments might include items such as: teaching breastfeeding to mothers is difficult, or teaching mothers to breastfeed is time-consuming.

The sampling design also imposes certain limitations on the results. With respect to the "distaste of breastfeeding" belief, it is possible that "distaste" is a relative term between persons with different backgrounds, cultures or occupations. For example, nurses simply might not perceive the process of breastfeeding as "distasteful" when compared to much of what is seen in a hospital. So, although this is a belief that mothers hold about breastfeeding, it is

possible that nurses do not associate "distasteful" with breastfeeding. Other groups of health professionals, such as public health nurses or medical practioners may however. It is possible that the multiple indicators were not representative of health professionals perception of distaste.

Fishbein and Ajzen's (1975) conceptual model of beliefs and attitudes suggests that a single score representing an individual's location on an evaluative dimension (attitude), may be obtained by assessing that person's salient beliefs toward a particular object. Theoretically, a score representing the respondents' attitudes toward breastfeeding could be obtained by summing their means from the belief indices. An overall "attitude toward breastfeeding" index was created. Strictly speaking, this measure is interpreted as being based on all the salient beliefs the individual has concerning breastfeeding. However, additional research is required to determine if the "attitude" index is a reliable and valid measure of attitudes toward breastfeeding. Use of the "attitude" index for assessing and generalizing to the larger population of health professionals is restricted.

Recommendations

Based upon the results obtained from, and the experience gained during this investigation, the following

Recommendations for future research are proposed:

1. Employ exploratory studies which would identify a set of attributes, pertaining to breastfeeding which are relevant for health professionals.
2. Select respondents randomly from a representative population of health professionals.
3. Utilize the three belief indices to tap beliefs regarding nutrition, moral responsibility and public acceptability of breastfeeding.
4. Include items reflecting different perspectives of the "convenience" and "distaste" of breastfeeding beliefs.

One of the motivating factors behind the initiation of this study was the apparent contradiction that although health professionals have indicated that they believe breastfeeding is superior to bottlefeeding, this favorableness is not reflected in their behaviors. Although the limitations inherent in the present investigation must be taken into account when examining causal relationships, an interesting correlation was found. Results from the analysis of variance indicated that those respondents who had the most positive beliefs and attitude toward breastfeeding, also intended to promote bottlefeeding. Fishbein and Ajzen's (1975) model suggest that specific behaviors are influenced by specific intentions, and that intentions are influenced by attitude and normative beliefs. Other authors also discuss the importance of additional factors on behavior such as

situational factors, motivation, and normative systems (McGuire 1976; Tones 1980). Perhaps then, as some authors and this investigation have alluded to, health professionals' attitudes toward breastfeeding are positive. Perhaps, attitudes do not require changing.

The key to obtaining a better understanding of the breastfeeding issue rests upon the adherence of investigators to sound measurement techniques. If these measuring procedures are to be scientifically useful they must lead to results which are reliable and valid. It is the contention of this author that the process of testing reliability and validity is greatly enhanced when conceptual definitions of the constructs such as beliefs, attitudes, intentions and behaviors are given special attention.

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APPENDIX A

COVER LETTER AND QUESTIONNAIRE

Dear Participant:

The questionnaire enclosed with this letter is part of a survey of health professionals in Edmonton and other Alberta communities. It will be used to determine present opinions held regarding breastfeeding.

If you would like to respond, I expect it should take about 15-20 minutes of uninterrupted time to complete. Please reply by April 1, 1983, by returning your completed questionnaire in the stamped, self-addressed envelope provided in this package.

Your questionnaire will be treated in a strictly confidential manner. The results of the study should be compiled by early summer and I would be happy to send you a summary upon request. If you have any queries about the questionnaire, phone me at 432-4925 or Paul Fieldhouse, Assistant Professor at 432-3829, or write to the address below.

Your cooperation is very much appreciated.

Yours sincerely,

Beverly Hill
M. Sc. Student
Room 313
Faculty of Home Economics
University of Alberta
Edmonton Alberta
T6G 2M8

Breastfeeding: An Opinion Survey

General Instructions

The questions and statements in this questionnaire all relate to breastfeeding. Most of the items ask for your opinions, so there are no right or wrong answers. It is important that you answer all the questions and in the order presented. Try not spend a great deal of time thinking about a question as it is your initial responses which are important. The questionnaire should only take you 15-20 minutes to answer. Please do not consult with others while filling out the survey and try to complete it at a time which will allow as few interruptions as possible.

All questionnaires will be treated in a strictly confidential manner.

Thank you very much for your assistance in conducting this study. I hope you enjoy the questionnaire and I look forward to receiving your answers.

DO NOT WRITE HERE

The first few questions deal with general information.

1. Sex: Male (____) Female (____) _____

2. Age: _____ years _____

3. Please indicate the total number of years of post-secondary education you have received, including professional training.
_____years _____

4. What is your current work/student status? (Check one) _____
Student____
Public Health Nurse____
Ward Nurse____
Dietitian____
Nutritionist____

5. Please answer a) and b) only if you are presently working.
a) How many years have you held this particular job?____ _____
b) How many years in total have you been in your profession?____ _____

Most of the following questions will ask you only to circle the number that represents the answer of your choice. For example:

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
SA	A	N	D	SD

If you strongly agree with the statement you would circle the number 1, and if you were mildly in disagreement with the statement you would circle the number 4. If you are not sure of your feelings, give the choice that appeals to you most at that moment.

For the purposes of the questionnaire the verbal responses have been abbreviated to initials, as listed above.

6. Breastfeeding ties a mother down. 1 2 3 4 5 (SA A N D SD) _____

7. Breastfeeding is old-fashioned. 1 2 3 4 5 (SA A N D SD) _____

DO NOT WRITE HERE

8. If you breastfeed you can't wear fashionable clothes.
1 SA 2 A 3 N 4 D 5 SD ____

9. Mothers who wish to breastfeed, often must oppose hospital regulations in trying to establish successful breastfeeding.
1 SA 2 A 3 N 4 D 5 SD ____

10. All mothers who are able should breastfeed their babies.
1 SA 2 A 3 N 4 D 5 SD ____

11. Breastfeeding is less trouble than bottlefeeding.
1 SA 2 A 3 N 4 D 5 SD ____

12. Breastfeeding restricts a mothers social life.
1 SA 2 A 3 N 4 D 5 SD ____

13. Bottlefeeding is easier than breastfeeding.
1 SA 2 A 3 N 4 D 5 SD ____

14. A father feels left out if the mother breastfeeds.
1 SA 2 A 3 N 4 D 5 SD ____

15. Breastfed babies are less likely to get ill than bottlefed babies.
1 SA 2 A 3 N 4 D 5 SD ____

16. Discussions about breastfeeding should occur in high-school courses.
1 SA 2 A 3 N 4 D 5 SD ____

17. Mothers feel much closer to their babies if they breastfeed.
1 SA 2 A 3 N 4 D 5 SD ____

18. Breastfeeding feels unpleasant to the mother.
1 SA 2 A 3 N 4 D 5 SD ____

19. Mothers get their figures back more quickly if they breastfeed.
1 SA 2 A 3 N 4 D 5 SD ____

		DO NOT WRITE HERE
21. Breastfeeding is messy.	1 SA 2 A 3 N 4 D 5 SD	
22. Breastfeeding allows more freedom for the mother than does bottlefeeding.	1 SA 2 A 3 N 4 D 5 SD	
23. There is something animal-like about a woman breastfeeding.	1 SA 2 A 3 N 4 D 5 SD	
24. Babies prefer the breast to the bottle.	1 SA 2 A 3 N 4 D 5 SD	
25. Breastfeeding mothers are providing the best food an infant can get.	1 SA 2 A 3 N 4 D 5 SD	
26. Breastfeeding is time-consuming.	1 SA 2 A 3 N 4 D 5 SD	
27. A regular feeding schedule is more convenient than demand feeding.	1 SA 2 A 3 N 4 D 5 SD	
28. Breastfeeding should be done on a demand schedule.	1 SA 2 A 3 N 4 D 5 SD	
29. Breastfeeding provides optimal nutrition.	1 SA 2 A 3 N 4 D 5 SD	
30. Breastfeeding does not permit an accurate assessment of whether the baby is getting enough milk.	1 SA 2 A 3 N 4 D 5 SD	
31. Bottlefeeding is the norm in our society.	1 SA 2 A 3 N 4 D 5 SD	
32. Breastfeeding provides emotional satisfaction to the mother.	1 SA 2 A 3 N 4 D 5 SD	

DO NOT WRITE HERE

32. Breastfeeding can be considered a relatively reliable form of birth control. 1 SA 2 A 3 N 4 D 5 SD ____

33. Breastfeeding mothers are less prone to breast cancer. 1 SA 2 A 3 N 4 D 5 SD ____

34. Bottlefeeding is an unnatural method of feeding a child. 1 SA 2 A 3 N 4 D 5 SD ____

35. Breastfeeding mothers are not able to contribute to society as working productive individuals. 1 SA 2 A 3 N 4 D 5 SD ____

36. Breastfeeding is the best way of feeding a child. 1 SA 2 A 3 N 4 D 5 SD ____

37. It would be better if breastfeeding were accepted more openly in public. 1 SA 2 A 3 N 4 D 5 SD ____

38. I would be pleased to know that my home town had a high rate of breastfeeding mothers. 1 SA 2 A 3 N 4 D 5 SD ____

39. Breastfeeding mothers are usually women who lead a more natural life. 1 SA 2 A 3 N 4 D 5 SD ____

40. Women who breastfeed their children after they are one year old are doing it for their own emotional needs. 1 SA 2 A 3 N 4 D 5 SD ____

41. I would be embarrassed to see a woman breastfeeding in public. 1 SA 2 A 3 N 4 D 5 SD ____

42. Scientific progress has resulted in formula milk that is nutritionally better than breastmilk. 1 SA 2 A 3 N 4 D 5 SD ____

		DO NOT WRITE HERE
43. A woman should not lie down in bed with her baby to breastfeed.	1 SA 2 A 3 N 4 D 5 SD	
44. Successful breastfeeders make better mothers.	1 SA 2 A 3 N 4 D 5 SD	
45. Breastfeeding is a natural act.	1 SA 2 A 3 N 4 D 5 SD	
46. Documentaries promoting breastfeeding should be shown on television.	1 SA 2 A 3 N 4 D 5 SD	
47. Advertisements promoting breastfeeding should get television exposure.	1 SA 2 A 3 N 4 D 5 SD	
48. Discussions about breastfeeding should be part of the health curriculum in primary school.	1 SA 2 A 3 N 4 D 5 SD	
49. People are embarrassed if they see a woman breastfeeding in a public area.	1 SA 2 A 3 N 4 D 5 SD	
50. Mothers should not breastfeed in front of older children.	1 SA 2 A 3 N 4 D 5 SD	
51. Breastfeeding in front of mixed company is acceptable.	1 SA 2 A 3 N 4 D 5 SD	
52. There is very little support given to women who wish to breastfeed in this society.	1 SA 2 A 3 N 4 D 5 SD	
53. Infants shouldn't nurse after they are six months old.	1 SA 2 A 3 N 4 D 5 SD	
54. All mothers should be encouraged to breastfeed.	1 SA 2 A 3 N 4 D 5 SD	

DO NOT WRITE HERE

55. Breastmilk is the best food for an infant. 1 SA 2 A 3 N 4 D 5 SD ____

56. Mothers should not breastfeed in public. 1 SA 2 A 3 N 4 D 5 SD ____

57. To be breastfed is a child's birth right. 1 SA 2 A 3 N 4 D 5 SD ____

58. Please indicate whether you agree or disagree that the following are contraindications to breastfeeding. ____

a) sleepy baby 1 SA 2 A 3 N 4 D 5 SD ____

b) tenderness of breast and nipple 1 SA 2 A 3 N 4 D 5 SD ____

c) poor rooting reflex 1 SA 2 A 3 N 4 D 5 SD ____

d) mastitis 1 SA 2 A 3 N 4 D 5 SD ____

e) squirming baby 1 SA 2 A 3 N 4 D 5 SD ____

f) tiredness of mother 1 SA 2 A 3 N 4 D 5 SD ____

g) breastleaking 1 SA 2 A 3 N 4 D 5 SD ____

h) small breasts 1 SA 2 A 3 N 4 D 5 SD ____

i) engorged breasts 1 SA 2 A 3 N 4 D 5 SD ____

j) insufficient milk 1 SA 2 A 3 N 4 D 5 SD ____

59. Learning how to breastfeed is difficult. 1 SA 2 A 3 N 4 D 5 SD ____

60. How would you rate the convenience of breastfeeding? (Check one) ____

Very convenient ___ Convenient ___
Inconvenient ___ Very Inconvenient ___
No Opinion ___

DO NOT WRITE HERE

61. What in your opinion is the attitude of mothers to breastfeeding: (Check one)
    The majority want to breastfeed___
    The majority are indifferent___
    The minority want to breastfeed___ ____

62. If I were to have a baby in the following year I would breastfeed it. (If you are male: -would want your wife to breastfeed it.)
    1 SA 2 A 3 N 4 D 5 SD ____

63. If a mother was unsure of how she planned to feed her expected baby I would recommend:(check one)
    Breastfeeding ___
    Bottlefeeding ___
    Or provide information on both methods and let her choose herself ___ ____

The next few statements deal with general feelings.

64. Most of the things that happen to me are the result of my own decisions.
    1 SA 2 A 3 N 4 D 5 SD ____

65. I have often found that what is going to happen will happen.
    1 SA 2 A 3 N 4 D 5 SD ____

66. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
    1 SA 2 A 3 N 4 D 5 SD ____

67. I really don't have much influence over the things that happen in my life.
    1 SA 2 A 3 N 4 D 5 SD ____

The next four statements are applicable only to those currently working. Student proceed to #72.

68. I am given a lot of freedom to decide how to do my job.
    1 SA 2 A 3 N 4 D 5 SD ____

DO NOT WRITE HERE

69. I have a chance to get to know my patients personally. 1 SA 2 A 3 N 4 D 5 SD ____

70. At work I am usually too busy to spend much time with my clients. 1 SA 2 A 3 N 4 D 5 SD ____

71. How many clients (approximately) do you have contact with in one day? ____ ____

The remaining questions are concerned with facts about yourself or those you know, please answer to the best of your ability.

72. In which province did you spend most of your time when growing up?

____ ____

Was it: (Check one)
Rural____ ____
Urban____
Small town____

73. Please indicate religious preference: ____

____

Would you call yourself a strong or not very strong (Stated preference from above) ____
a. __ Strong
b. __ Not very strong

74. Were you breastfed as an infant? Yes___ No___ Don't know___ ____

75. Do you have any children? ____
Yes___ No___

If yes: a) How many? _____ ____
b) How many were breastfed? ____ ____

76. Have you ever consulted with others to obtain breastfeeding information? ____
Yes___ No___

If yes: With whom? _____ ____

DO NOT WRITE HERE

77. Do you have any friends and/or relatives who have breastfed their children?
Yes___ No___ Don't know____ _____

If yes: How many? _____ _____

78. Do you have any brothers and/or sisters?
Yes___ No___ _____

If yes: Are any younger than you?
Yes___ No___

If yes: Were these younger ones breastfed?
Yes___ No___ _____
Don't know____ _____

Thank-you for your time and cooperation. If you have any ideas or questions about the questionnaire or the topic, please feel free to comment in the space below. I welcome your suggestions.

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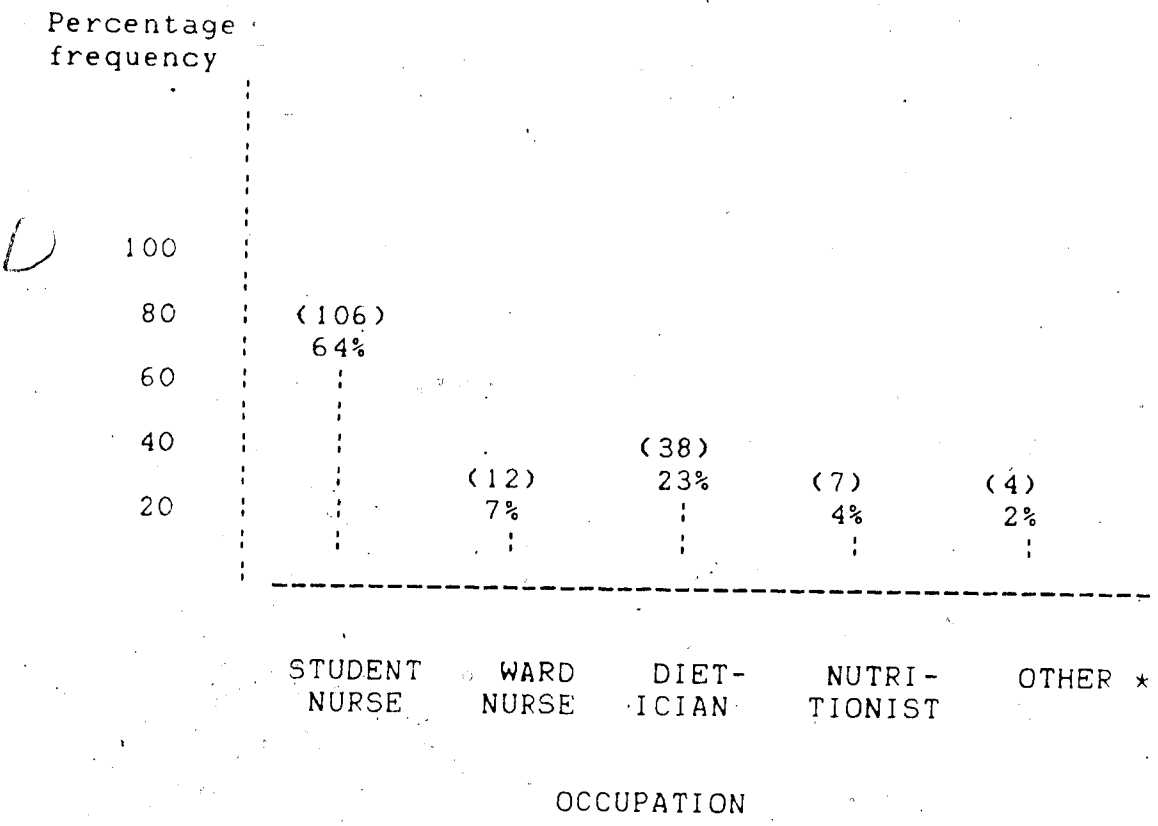
APPENDIX B

The frequency distributions of the respondents by selected personal and environmental characteristics.

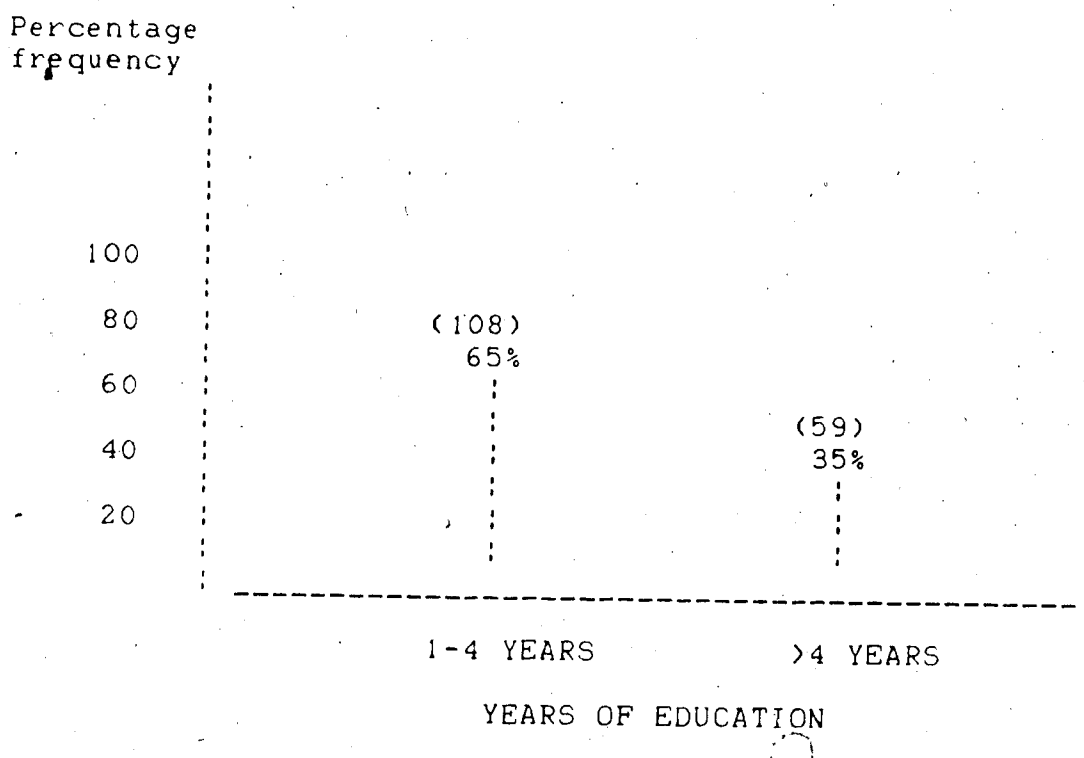
FIGURE B.1: DISTRIBUTION OF RESPONDENTS ACCORDING TO OCCUPATION



Data enclosed in brackets indicates absolute frequency.

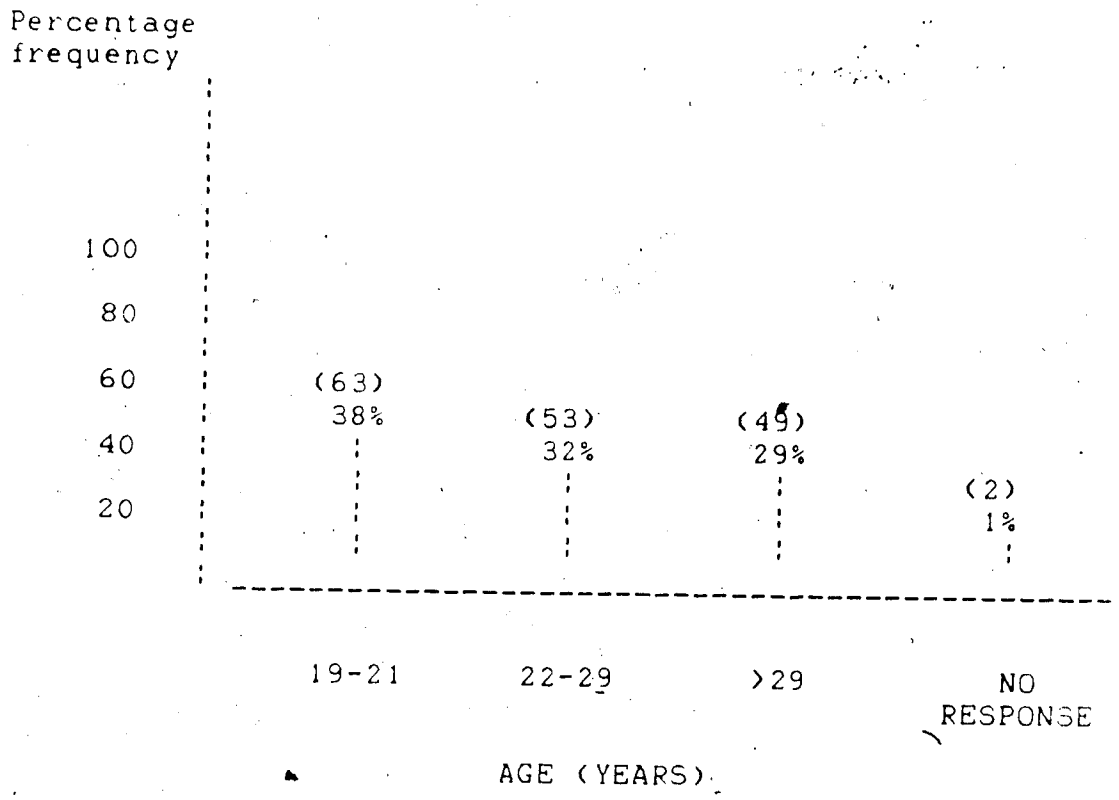
* includes one public health nurse and three O.N.E. respondents

FIGURE B.2: DISTRIBUTION OF YEARS OF EDUCATION OF RESPONDENTS



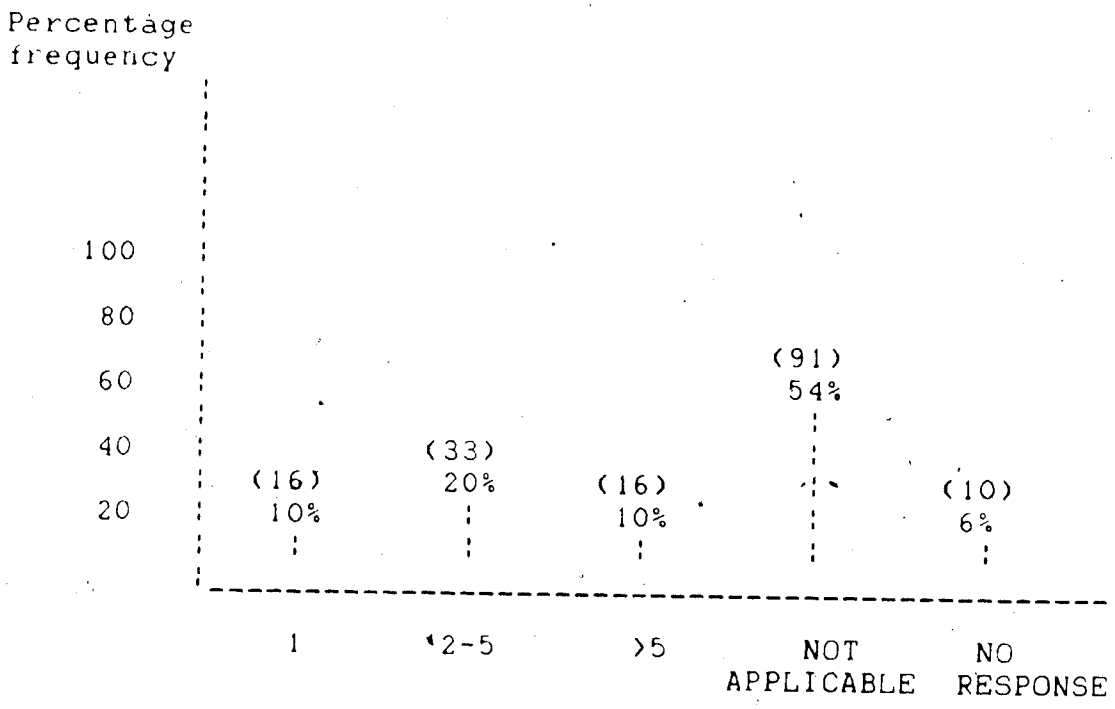
Data enclosed in brackets indicate absolute frequency.

FIGURE B.3: AGE DISTRIBUTION OF RESPONDENTS IN THE RESEARCH STUDY



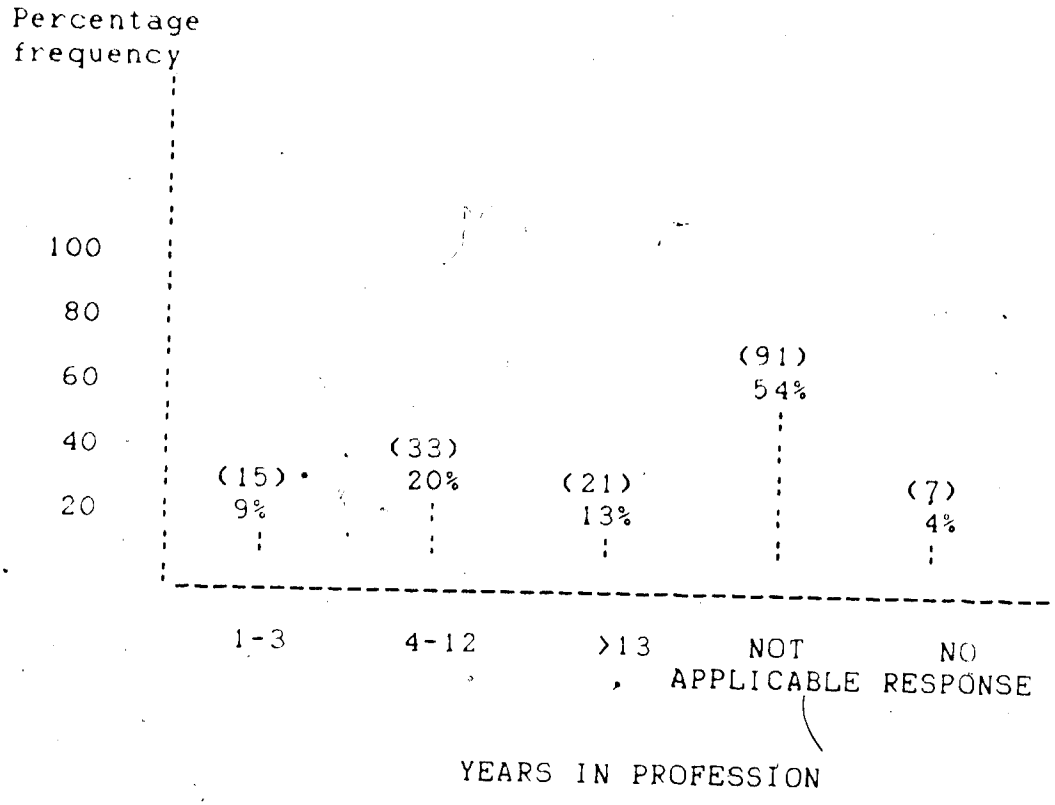
Data enclosed in brackets indicate absolute frequency.

FIGURE B.4: SENIORITY WITHIN JOB



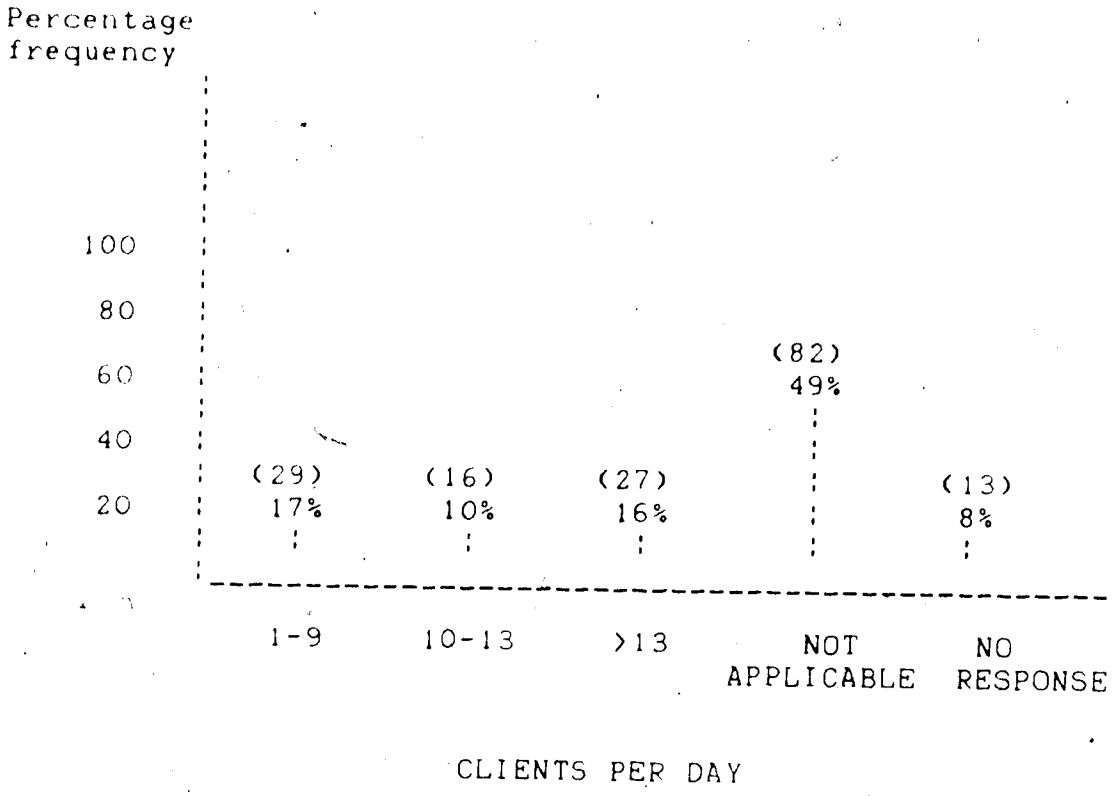
Data enclosed in brackets indicate absolute frequency.

FIGURE B.5: SENIORITY WITHIN PROFESSION



Data enclosed in brackets indicate absolute frequency.

FIGURE B.6: NUMBER OF CLIENTS THE RESPONDENTS SAW IN ONE DAY



Data enclosed in brackets indicates absolute frequency.