

**Factors Associated with Prevention of Constipation and Maintenance of Normal Bowel  
Functioning in Community Dwelling Older Adults**

**By**

**Kimberly Wiebe**

**A Thesis**

**Submitted to the Faculty of Graduate Studies  
In Partial Fulfillment of the Requirements  
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**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University  
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**KIMBERLY WIEBE ©2003**

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### *Abstract*

The purpose of this descriptive exploratory research project was to examine the factors associated with the older adults' health behaviour practices to maintain normal bowel functioning and prevent constipation. In order for nurses to effectively work with the older adult in regards to self care to maintain normal bowel function it is important to know what factors may be influencing the older adult to make their health behaviour choices. The Health Belief Model guided the examination of which factors may be associated with the use of physician recommended methods to prevent constipation or maintain normal bowel function. As well, examination of which factors may be associated with the use of Professional recommended methods versus Non-Professional recommended methods to prevent constipation or maintain normal bowel function was undertaken. A convenience sample of 78 community dwelling older adults aged 65 or more residing in private homes, apartment buildings and seniors housing was recruited. Data was collected in face-to-face interviews using a questionnaire constructed by the investigator. The questionnaire collected demographic information and utilized several standardized instruments, some instruments modified by the investigator for this project and some open-ended questions. Statistical analysis using bivariate and hierarchical multiple logistic regression suggested little in the way of statistical support for the investigated factors associated with the outcome variables. Implications for nursing practice and future research investigations are identified.

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## *Table of Contents*

Abstract	2
Acknowledgements	3
List of Figures	7
List of Tables	7
Chapter One: Statement of the Problem	9
Chapter Summary	15
Chapter Two: Literature Review	15
Section One: Normal Bowel Function	16
Age related Changes in Bowel Function	18
Why focus on Constipation?	19
Constipation: A definition	21
Possible Causes, Contributors and Influences of Constipation	22
Treatment and Prevention of Constipation and Maintenance of Patterns of Normal Bowel Elimination	25
Section Two: Self-Care	35
Theories of Health Behaviour	39
Nursing Theories of Health Behaviour	41
Social & Psychological Theories of Health Behaviour	42
Chapter Summary	44
Chapter Three: Conceptual Model	45
History of the Health Belief Model	45
The Health Belief Model and the Maintenance of Normal Bowel Elimination and Prevention of Constipation	47
Modifying Variables & Cues to Action	50
Demographics	51
Sociopsychological Variables	58
Structural Variables	61
Cues to Action	63
Chapter Summary	65
Chapter Four: Research Methodology	66
Sample Recruitment	66
Ethical Considerations	68
Pilot Study	71
Data Collection	71
Conceptual Definitions	73
Operational Definitions	75
Measurement of Study Variables	76
Outcome Variables	76

Descriptive Variables	78
Qualitative Inquiry	79
Independent Variables	80
Demographic Variables	83
Background of Winnipeg Areas	86
Background of PCCF, SEFI & SEFI Variable	87
Sociopsychological Variables	89
Structural Variables	94
Cues to Action Variable	98
Qualitative Data Analysis	98
Quantitative Data Analysis	100
Results of Testing for Multicollinearity	101
Limitations of the Study	102
Chapter Summary	103
Chapter Five – Study Findings	104
Sample Characteristics	104
Qualitative Analysis	110
Univariate Data Analysis	124
Bivariate Data Analysis for MD recommended Methods	133
Multivariable Findings for MD recommended Methods	139
Bivariate Data Analysis for Professional recommended Methods	143
Multivariable Findings for Professional recommended Methods	149
Chapter Summary	150
Chapter Six – Discussion and Implications	152
Explanations for Research Findings	152
Factors Influencing Study Findings and Limiting Generalizability	168
Implications for Nursing Practice	171
Implications for Future Research	174
Summary And Conclusion	175
References	176
Appendix A: Poster	217
Appendix B: Ethics Approval	218
Appendix C WRHA Approval	220
Appendix D Recruitment Script	223
Appendix E Information for Study Participants	224
Appendix F Consent Form	225
Appendix G Bowel Care Recipes	227
Appendix H Study Questionnaire	229
Appendix I HBM & Methods to Prevent Constipation and Maintain Normal Bowel Function	246
Appendix J Winnipeg Health Region Community Areas	247
Appendix K Winnipeg Health Region Neighborhood Clusters	249

Appendix L	Letter of Agreement for use of PCCF File	251
Appendix M	SEFI Value Listing	254
Appendix N	Multidimensional Health Locus of Control Scales	256
Appendix O	Manitoba Study on Health and Aging Questions	258
Appendix P	Lubben Social Network Scale	262
Appendix Q	Spearman Rank Correlation & Pearson's Product Moment Correlation Matrixes for MD Recommended Methods	265
Appendix R	Spearman Rank Correlation & Pearson's Product Moment Correlation Matrixes for Professional Recommended Methods	267



### *List of Figures*

Figure 1: The Original Health Belief Model	49
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### *List of Tables*

Table 1:	Recruitment Results	68
Table 2:	Types of Methods Used	105
Table 3:	Types of Methods Used by Gender	106
Table 4:	Duration of Use	108
Table 5:	Frequency of Use in Month Previous to Interview	109
Table 6:	Characterization/description of how bowels have been over the years	111
Table 7:	Characterization/description of normal bowel functioning	113
Table 8:	Characterization/definition of regularity	115
Table 9:	Indicators of change from normal bowel function	117
Table 10:	Definition of Constipation	119
Table 11:	Symptoms of Constipation	121
Table 12:	Areas of Life affected by Constipation	123
Table 13:	Modifying Factors of Sample	126
Table 14:	Structural Factors of Sample	129
Table 15:	Sociopsychological & Cue to Action Factors of Sample	131
Table 16:	Perception Factors of Sample	133
Table 17:	Bivariate Comparison of Modifying Factors of Respondents using MD & Non-MD recommended Methods	135
Table 18:	Bivariate Comparison of Structural Factors of Respondents using MD & Non-MD recommended Methods	136
Table 19:	Bivariate Comparison of Sociopsychological & Cue to Action Factors of Respondents using MD & Non-MD recommended Methods	138
Table 20:	Bivariate Comparison of Perception Factors of Respondents using MD & Non-MD recommended Methods	139
Table 21:	Hierarchical Stepwise Logistic Regression Model for use of MD recommended methods	143
Table 22:	Bivariate Comparison of Modifying Factors of Respondents using Professional & Non-Professional recommended Methods	145
Table 23:	Bivariate Comparison of Structural Factors of Respondents using Professional & Non-Professional recommended Methods	146
Table 24:	Bivariate Comparison of Sociopsychological & Cue to Action Factors of Respondents using Professional & Non-Professional recommended Methods	148

Table 25: Bivariate Comparison of Perception Factors of Respondents using Professional & Non-Professional recommended Methods	149
Table 26: Hierarchical Stepwise Logistic Regression Model for use of Professional recommended methods	151

## **Chapter One**

### **Statement of the Problem**

Bowel function is a bodily process, which the general public is reluctant to discuss once control is established after the age of two (Koch, Sando & Hudson, 1999; Powell & Rigby, 2000). It is a natural biological action that is comprised of several interconnected physiological, chemical and musculature processes. When the process is altered several familiar conditions may arise including constipation or diarrhoea (Woodward, 1999).

Constipation is repeatedly identified in the literature as a common problem for the aged population (Abyad & Mourad, 1996; Beers & Berkow, 1999; Campbell, Busby & Horwath, 1993; Cummings, 1994; Hull, Greco & Brooks, 1980; Powell & Rigby, 2000; Talley, Fleming, Evans, O'Keefe, Weaver, Zinsmeister & Melton, 1996; Talley, O'Keefe, Zinsmeister & Melton, 1992). It affects fewer than 2 percent of the population under 65 years of age but increases to 26 percent in men and 34 percent in women 65 years and older (Schaefer & Cheskin, 1998). In an epidemiological study using four national American surveys, Sonnenberg and Koch (1989) identified that in the general population the prevalence of constipation increases with age particularly after age 65. Constipation in the older adult has been linked to impaired general health, low-fibre diets, lack of exercise and use of constipating medications (Abyad & Mourad, 1996; Beers & Berkow, 1999; Campbell, Busby & Horwath, 1993; Cummings, 1994; De Lillo & Rose, 2000; Fisher, 1993; Hull, Greco & Brooks, 1980; Powell & Rigby, 2000; Talley, Fleming, Evans, O'Keefe, Weaver Zinsmeister & Melton, 1996; Talley, O'Keefe, Zinsmeister & Melton, 1992; Woodward, 1999).

There is a stereotypical attitude in general society as well as within the health care sector that tends to trivialize the problem of constipation and assumes that with advancing age comes a natural change in bowel function (Castle, 1987; Koch, Sando & Hudson, 1999). Many health care professionals assume that constipation is a direct result of aging (Koch, Sando & Hudson, 1999). However, there is conflicting information in the literature as to whether constipation is related to aging changes. Schaefer and Cheskin (1998) indicate some studies show an increase in transit time with increased age. Other sources indicate that changes related to the aging of the gut may contribute to constipation (Brocklehurst, 1994; Jones, 1994). Other sources however indicate that no changes in the motor function of the sigmoid, rectum, small bowel or in transit times occur with increased age (Abyad & Mourad, 1996; Castle, 1989; Davies, Crowder & Dickerson, 1986; Harari, Gurwitz, Avorn, Bohn & Minaker, 1996; Murray & Bliss, 1991; Rimon & Levy, 2000; Shamburek & Farrar, 1990; Shamburek, Scott & Farrar, 1990; Wald, 1990; Wilson, 1999). Other investigators have emphasised that nothing about aging per se occurs consistently enough in all older adults to cause constipation (De Lillo & Rose, 2000; Harari, Gurwitz, Avorn, Bohn & Minaker, 1996; Woodward, 1999).

There are serious consequences and complications that are known to arise from constipation. Some of these include: fecal impaction, fecal and urinary incontinence, rectal distension, bowel obstruction, anorexia, nausea, delirium, distress and laxative abuse (De Lillo & Rose, 2000; Woodward, 1999). Constipation has also been related to diminished quality of life in older adults (Castle, 1987; De Lillo & Rose, 2000; O'Keefe, Talley, Zinsmeister & Jacobsen, 1995; Schaefer & Cheskin, 1998).

Much of the research literature focuses on the effectiveness of various treatment modalities for those persons living in institutional settings (Benton, O'Hara, Chen, Harper & Johnston, 1997; Beverley & Travis, 1992; Brockelhurst, Kirkland, Martin & Ashford, 1983; Brown & Everett, 1990; Chassagne, Jeco, Gloc, Capet, Trivalle, Doucet, Denis & Bercoff, 2000; Gibson, Opalka, Moore, Brady & Mion, 1995; Mathiesen Behm, 1985; Pringle, Pennington, Pennington & Ritchie, 1984; Smith, Rowe, Smith, Eastwood, Drummon & Brydon, 1980; Sanders, 1978). There is an apparent lack of research on effective remedies utilized by older persons living in the community. One possible reason for this may be due to the fact that there has been little advancement in the management of constipation over the past decades because there is a general lack of interest by health care providers in the problem due to the ready availability of "so called safe and gentle laxatives to the public" (Castle, 1987, p. 1703; Koch & Hudson, 2000).

Unfortunately laxative over-use, abuse and dependency amongst older adults are serious concerns (Bradford & Dunbar, 1987; Talley, O'Keefe, Zinsmeister and Melton, 1992). Studies in Australia, the United Kingdom and the United States have found rates of laxative use amongst older adults to vary between a high of 88% to a low of 18% (Talley et. al., 1992). Two to three million people on an annual basis are prescribed laxatives and cathartics by their general and family practitioners. "Complaints related to constipation account for over 2.5 million physician visits every year. In addition, persons seeking symptomatic relief of constipation spend more than \$400 million per year on laxatives" (Schaefer & Cheskin, 1998, p. 907). In a study of older Americans 65 years of age and older living in the community 30% described themselves as constipated and of these 52% of men and 38% of women self medicated with laxatives or enemas, while

22% consulted their physician about the concern (Whitehead, 1994). This was further confirmed by Wolfsen and colleagues (1993) who found that older persons routinely use laxatives, stool softeners and enemas to treat their constipation whereas younger adults were more likely to alter diets and try exercise programs before turning to laxative preparations for treatment. Harari and colleagues (1996) and Heaton & Cripps (1993) both found that laxative use was more common in women aged 60-69 years than in men of this age range. In a study of adults by Milne and Williamson daily laxative use to ensure a daily bowel movement was reported by 70% of the sample (as reported in Bradford & Dunbar, 1987).

Because laxatives are usually sold over-the-counter people tend to assume they are a benign medication and are safe to use on a regular basis (Lisi, 1994). In fact these preparations can be harmful and may perpetuate the very condition that they are taken to alleviate (Cheskin, Kamal, Crowell, Schuster & Whitehead, 1995; Bradford & Dunbar, 1987). Chronic use of laxative preparations can cause destruction of neurons in the enteric nervous system which in turn can result in motility impairment, dilation of the colon resulting in further aggravation of constipation and diminished effectiveness of the laxative preparation (Abyad & Mourad, 1996; Bradford & Dunbar, 1987; De Lillo & Rose, 2000; Harari, Gurwitz, Avorn & Choodnovskiy & Minaker, 1994; Lennard-Jones, 1994; Whitehead, 1994). Over time the result is a need to resort to even stronger purgatives (Cheskin, Kamal, Crowell, Bradford & Dunbar, 1987; Schuster & Whitehead, 1995). The use of stimulant laxatives poses greater potential for adverse side effects such as hypokalemia, hypermagnesaemia and hypoalbuminemia (Abyad & Mourad, 1996;

Harari, Gurwitz, Avorn, Choodnovskiy & Minaker, 1995; Harari et al., 1996; Lennard-Jones, 1994).

Very little is known about what influences the elderly client to make the choices they do in regards to bowel regularity and self care regimens to maintain normal bowel functioning. Campbell, Busby & Horwath (1993) found that many elderly persons who considered themselves at risk of constipation adjusted their diets to contain food that they thought were good for their bowels. Tradition, culture and "people's expectations of "what is normal" are believed to influence management choices (Powell & Rigby, 2000, p. 47). Harari and colleagues (1996) suggest that factors other than a concern regarding bowel movement frequency must be involved in order to explain the notably significant use of over-the-counter laxatives in the elderly population. Straining during defecation and hard bowel movements have been identified as reasons for older adults to self-treat with laxatives (De Lillo & Rose, 2000). It is likely that psychologic and sociocultural factors influence the choice to present to a physician or not (Sandler, Drossman, Nathan & McKee 1984; Talley et.al., 1992). The health behaviour of elderly persons with symptoms of constipation has received limited investigation (De Lillo & Rose, 2000).

Reasons why older adults choose to use laxatives to deal with their constipation are speculative at best in the literature. Research into what factors influence and affect a person's choice of method(s) to prevent constipation and maintain normal bowel function is required. In order for nurses to effectively work with the older adult in regards to self care to maintain normal bowel function it is important to know what influences the older adult to make their health behaviour choices. The purpose of this exploratory study was

to examine the factors associated with the older adults' health behaviour practices to maintain normal bowel functioning and prevent constipation.

The research questions which guided this study include:

1. What do older adults consider normal bowel functioning?
2. How do older adults define constipation?
3. What health behaviours and methods are used by a sample of community dwelling older adults to maintain normal bowel functioning and prevent constipation?
4. What are the reasons for the method(s) selected to maintain normal bowel functioning?
5. Who is most frequently consulted by older adults for health behaviour methods to prevent constipation and maintain normal bowel function?
6. What factors are associated with the use or non-use of physician recommended/prescribed methods for constipation and maintenance of normal bowel function? In particular, do gender, functional health, and health locus of control have an association, with the use of physician recommended/prescribed methods for constipation when other factors are controlled for?
7. Are there particular factors associated with the use of methods recommended by a professional (eg. Nurse, Pharmacist; Dietician) versus those methods recommended by Non-Professionals (eg. friends/family; literature/media)?



***Summary***

This chapter has outlined the problem of constipation and its treatment as it relates to older community dwelling adults. The importance of the need for nursing research pertaining to this topic was presented and overall goal of the thesis study was identified.

## **Chapter Two Literature Review**

This chapter provides a framework for the study of health behaviour practices for maintenance of normal bowel function and prevention of constipation in the community dwelling older adult. It is divided into two sections. Firstly, a review of the current literature pertaining to normal bowel function, age related changes in bowel function, constipation and treatment modalities related to prevention of constipation and maintenance of normal bowel function is undertaken. In the second section the concepts of self-care and health behaviour are reviewed and conceptual models used to study health behaviour are critically examined.

### ***Section One: Normal Bowel Function***

Colonic or bowel motility is characterized by low amplitude segmenting contractions. These contractions mix, churn and move the intestinal contents forward and backward so that it is exposed to the mucosa of the intestine where water, fatty acids and electrolytes are absorbed (Kamm, 1994; Van DeGraaff & Fox, 1986). Following a meal the frequency and amplitude of these contractions increases. Several times a day a high pressure peristaltic wave travels through a considerable length of the colon. These high pressure waves are responsible for transporting the colonic contents through the large intestine (Kamm, 1994; VanDeGraaff & Fox, 1986). Intrinsic nerves within the colon extend from the brain and follow a similar pathway as those for micturition and control the colon's motor function. Defecation is believed to be under the control of the cortex of the brain although another major centre for defecation control is also believed to be in the pons (Kamm, 1994). A complex sequence of events integrating somatic, autonomic and enteric nervous systems occurs for the purpose of defecation (Read, 1994). Sensory

nerves in the rectum signal the arrival of feces. As waste material moves into the rectum there is an increase in rectal pressure and the urge to defecate is felt. This triggers a reaction of complex processes wherein the abdominal pressure rises and the internal anal sphincter is relaxed. With the relaxation of the internal anal sphincter the fecal material is allowed to descend into the anal canal. The external sphincter pressure falls, rectal contractions are generated and the puborectalis muscle relaxes allowing the pelvic floor to descend causing the anorectal angle to increase resulting in defecation. The contractile activity of the rectum is believed to intensify the sensory experience and accounts for the feelings of urgency and the need to defecate (Powell & Rigby, 2000; Read, 1994).

During the act of defecation, expulsion of feces from the rectum, a variable length of the colon is emptied of its contents. Defecation may clean only the rectum or as far back as the distal transverse colon. If defecation is suppressed, retrograde movement of colonic contents occurs (Kamm, 1994, p. 66). A study by Klauser and colleagues (1990, cited in Whitehead, 1994) was able to show that healthy young students were able to substantially delay the process of defecation when they were rewarded with money for doing so. As such the hypothesis that persons can learn how to inhibit defecation given the process of modelling and reinforcement was demonstrated (Whitehead, 1994). Thus bowel evacuation or defecation reflex is a learned response. Persons learn how to control and ignore the defecation reflex. If the defecation urge is denied, the waste material is prevented from entering the anal canal and remains in the rectum and may even back up into the sigmoid colon.

In regards to physiological differences in defecation between the sexes, it has been shown that “women pass smaller and harder stools less frequently than men and that

they have longer colonic transit times” (Read, 1994, p. 159). Men tend to have shorter colonic transit times than women (Harari, Gurwitz, Avorn, Bohn & Minaker, 1996). Campbell, Busby & Horwath (1993) also determined that women were more likely than men to experience constipation regardless of age.

### ***Age related Changes in Bowel Function***

There is conflicting literature regarding age related changes in bowel function. There are those who indicate that bowel motility and frequency of bowel movements does not change as a result of aging. Inconsistent evidence exists, with a number of studies showing an increase in transit time with increased age whereas other studies have indicated no change in the motor function of the sigmoid, rectum, or small bowel and no increase in transit times with increased age (Brocklehurst, 1994; Davies, Crowder & Dickerson, 1986; Fich, Camilleri & Phillips, 1989; Harari et al. 1996; Schaefer & Cheskin, 1998). Castle (1989) and a review by the American Geriatrics Society (1996) indicate that an aging gut may experience atrophy of the mucosa and musculature, increased amounts of connective tissue as well as arteriosclerosis that may affect bowel function. Wald (1990) further suggests that the older adult may have a less compliant rectum and a change in sphincter tone and pressure that may contribute to altered contraction coordination. Other investigators have emphasised that nothing about aging per se occurs consistently enough in all older adults to cause constipation (De Lillo & Rose, 2000; Harari, Gurwitz, Avorn, Bohn & Minaker, 1996; Koch & Hudson, 1996; Murray & Bliss, 1991; Woodward, 1999).

### *Why focus on constipation?*

The focus of this thesis project is on constipation. Reasons for choosing this focus are three-fold. Firstly, constipation is a concern faced by many older adults yet there is little to be found in the literature that investigates the management techniques for this concern. There are studies that identify that laxative use is prevalent amongst the older adult populations in both North America and in Europe (Donald, Smith, Cruikshank, Elton & Stoddart, 1985; Harari, Gurwitz, Avorn, Bohn & Minaker, 1996; Sonnenberg & Koch, 1989; Talley, Fleming Evans, O'Keefe, Weaver, Zinsmeister & Melton, 1996; Talley, O'Keefe, Zinsmeister & Melton, 1992). Talley and colleagues (1992) studied an age and gender stratified random sample of 500 Minnesota residents aged 65-93 years. The results indicated that 18% of the sample used laxatives and/or enemas in the prior year with 7% taking three or more laxatives a week.

In 1996 Talley and another group of colleagues studied 1375 residents of Minnesota aged 65 years and older. In this survey the investigation of constipation treatments was again limited to a response to 2 questions regarding the number of laxatives or enemas used by respondents in the previous year. Results indicated that 53% of those who reported that they were constipated used laxatives or enemas. Sonnenberg and Koch (1989) revealed that 2 to 3 million people annually are prescribed laxatives and cathartics by their physicians. This study however did not differentiate age groups. Donald and colleagues (1985) performed a cross-sectional survey of two populations of elderly subjects, one group of 129 people with a mean age of 76.3 years from a general medical practice and one group of 90 people with a mean age of 79.1 years from two geriatric day hospitals. This survey found that 70% of the general practice sample never

used laxatives, 15% used them less than once per week and 6% used them daily. In comparison 46% of the day hospital group never used laxatives, 22% used them less than once per week and 13% used them daily. Harari and colleagues (1996) utilized data from a national health survey to reveal that of those in the sample aged 60 years or older (N= 11,017) 75.6% used at least one dose of laxative per month. In all of these studies there is little to no discussion identifying which types of laxatives are utilized and by whom. There is nothing which examined the factors which influenced this use nor was there any investigation into what other methods are used to control constipation and to maintain normal bowel functioning by community dwelling older adults.

The second reason for deciding to investigate this subject area is based on experience working with older adults and their families. Constipation and the maintenance of normal bowel function are concerns, which lack the respect and attention they deserve. Sonnenberg and Koch (1989) in their epidemiological study based on four national surveys involving over 4 million people in the United States suggest that the impact of constipation on "national health is most likely underestimated because it seldom leads to hospitalization or death" (p. 6). Constipation is thought not to be medically challenging. Nurses and other medical professionals routinely discount the impact that constipation and bowel management have on the older adult not to mention the frustration voiced by family members who assist their relative(s) in the "trial and error" phase of "finding out what works".

Third, the complications that can arise from constipation are many and the misuse of laxatives can create their own difficulties. In order to avoid these problems knowledge and comprehension of the various factors influencing and impacting on health behaviour

practices to maintain bowel function and to protect against and prevent constipation is required. Understanding what is impacting on an older adult in his or her quest to achieve and maintain bowel function and to avoid constipation will allow nurses and other health professionals to better communicate and problem solve with their clientele.

***Constipation: A definition***

There is a feeling amongst some health care professionals that the problem of constipation is “more imagined than real, as the great majority of those complaining of constipation have a bowel motion more frequently than three times per week” (Campbell, Busby & Horwath, 1993, p. 23). Where the problem lies is in the definition of constipation. The term constipation holds different meanings depending on the individual. Older adults often define constipation as straining at stool, pain on defecation, a sense of incomplete evacuation, consistency of stool or long periods between bowel movement (Brocklehurst, 1980; De Lillo & Rose, 2000; Kennedy-Malone, Fletcher & Plank, 2000; Wald, 1990). Health professionals usually consider frequency of defecation episodes, stool weight, colon transit time and anorectal manometry when thoughts about the definition of constipation arise (Ashraf, Park, Lof & Quigley, 1996; Koch & Hudson, 2000). The normal frequency of stool evacuation can comprise a broad or narrow range of time that varies with the individual. The “usual” range is anywhere from one to three times per day to three times per week (Beers & Berkow, 1999; Schaefer & Cheskin, 1998). Fewer than three times per week may be considered normal if this does not represent a change from the usual frequency of baseline defecation episodes and is not associated with discomfort (Abyad & Mourad, 1996).

Constipation is also considered by many medical persons to be defined upon the basis of its cause ie. if it is based on a functional cause or a rectosigmoid outlet impedance cause (Schaefer & Cheskin, 1998; Talley, Fleming, Evans, O'Keefe, Weaver, Zinsmeister & Melton, 1996). Functional constipation is defined as straining at least 25% of the time; lumpy or hard stool at least 25% of the time; feeling of incomplete evacuation at least 25% of the time; less than 3 stools per week; or fewer than 2 bowel movements per week in the absence of the previously listed symptoms ie. there is no straining, no pain and no hardness with the stool (Beers & Berkow, 1998; Kennedy-Malone, Fletcher & Plank, 2000; Rimon & Levy, 2000; Schaefer & Cheskin, 1998; Talley, Fleming, Evans, O'Keefe, Weaver, Zinsmeister & Melton, 1996). Rectosigmoid outlet impedance is defined as anal blockage more than 25% of the time and prolonged defecation (10 or more minutes) or manual disimpaction or digitations (manually pressing in or around the anus) (Schaefer & Cheskin, 1998; Talley, Fleming, Evans, O'Keefe, Weaver, Zinsmeister & Melton, 1996).

#### ***Possible Causes, Contributors and Influences of Constipation***

There are many possible causes and influences/contributors of constipation identified in the literature. These include: dietary factors (low residue diet); motility disturbances (colonic inertia or spasm such as in irritable bowel syndrome); sedentary living and poor mobility; increased frailty as well as social and cultural influences (Abyad & Mourad, 1996; Beers & Berkow, 1999; Campbell, Busby & Horwath, 1993; Donald, Smith, Cruikshank, Elton & Stoddart, 1985; Koch & Hudson, 2000; Pattee & West, 1988; Schaefer & Cheskin, 1998).



Structural abnormalities like fissures, rectocele, strictures and tumours may also contribute to constipation (Abyad & Mourad, 1996; Beers & Berkow, 1999; Pattee & West, 1988; Rimon & Levy, 2000; Schaefer & Cheskin, 1998). Haemorrhoids, which have been historically linked with constipation, recently came under scrutiny by Johanson and Sonnenberg (1990), as they found no epidemiologic data to support the causality. They also identified a significant decline in the presence of haemorrhoids after the age of 65. Their study did reconfirm that constipation increases after age 65.

Microflora alterations in the aging gut have also been implicated in the causes of constipation (Kleesen, Sykura Zunft & Blaut, 1997). Endocrine or metabolic changes such as with debilitating infections, hypercalcemia, hypokalemia, hypothyroidism, uremia or porphyria have been shown to cause constipation (Abyad & Mourad, 1996; Beers & Berkow, 1999; Rimon & Levy, 2000; Schaefer & Cheskin, 1998). In a study of institutionalized older adults (N=694), Harari and colleagues (1995) found diabetes mellitus to be a factor correlated with regular laxative use. It produced a 60 percent increased risk of using laxatives regularly in their sample population.

Neurogenic or neurological disorders which impact on bowel functioning include cerebrovascular events; Parkinson's disease; spinal cord tumors or other traumas, local neurogenic disorders like irritable bowel syndrome, colonic inertia/ diminished colonic peristalsis or rectal insensitivity to fecal masses, megacolon as well as functional disorders of the pelvic floor (also called anismus, pelvic floor outlet obstruction, paradoxical, spastic or nonrelaxing puborectalis syndrome or dysfunction of pelvic floor/anal sphincters) (Abyad & Mourad, 1996; Beers & Berkow, 1999; Gilliland, Heymen, Altomare, Park, Vickers & Wexner, 1997; Kennedy-Malone, Fletcher & Plank,

2000; Rimon & Levy, 2000; Reifer, Wattchow, Sarre, Saccone, Rich, Cooper, Marshall & McCall, 1997; Schaefer & Cheskin, 1998). In a study by Harari and colleagues (1995) of older adults in a long-term care institution (N=694) it was found that residents with Parkinson's disease were more at risk of regular laxative use. When possible confounding factors were adjusted for, this group of residents was also shown to have a three-fold increase in their risk of laxative dependency.

Smooth muscle or connective tissue disorders, which include amyloidosis and scleroderma, have also been reported in the literature as possible causes of constipation (Abyad & Mourad, 1996; Beers & Berkow, 1999; Schaefer & Cheskin, 1998).

Psychiatric and emotional factors are also known to impact on bowel function (Donald, Smith, Cruikshank, Elton & Stoddart, 1985; Kennedy-Malone, Fletcher & Plank, 2000; Rimon & Levy, 2000). Psychological and psychiatric conditions like depression and anxiety may act as a trigger for constipation. A study by Gorard, Gomborone, Libby and Farthing (1996) indicates that anxiety is associated with increased bowel frequency and depression is associated with constipation thus concluding that mood has an effect on intestinal speed and function. Beers & Berkow (1999) and Abyad & Mourad (1996) indicate that many persons incorrectly believe that daily defecation is required and complaints of constipation ensue if daily stool frequency is not maintained. Whitehead, Bosmajian, Zonderman, Costa and Schuster (1988) further suggest that persons with psychiatric distress are more likely to self select themselves to seek treatment with a physician for bowel complaints whereas other people without psychiatric distress will simply ignore or treat the bowel symptoms themselves.

Medications have been identified in the literature as having huge implications in regards to their effects on bowel regularity. Some of the medications that are known to impact on bowels include analgesic drugs like narcotics and non-steroidal anti-inflammatory drugs. Antacids like aluminum hydroxide and calcium carbonate can cause constipation. Anticholinergic drugs and antidepressant drugs, namely the tricyclic antidepressants and Lithium as well as tranquilizers and sedatives, can lead to constipation. Antihypertensive and antiarrhythmic drugs like calcium channel blockers, especially verapamil as well as metals like bismuth, iron and other heavy metals, all can cause constipation. Sympathomimetic drugs like Pseudoephedrine are also implicated in contributing to constipation (Abyad & Mourad, 1996; Beers & Berkow, 1999; Rimon & Levy, 2000; Schaefer & Cheskin, 1998).

#### ***Treatment and Prevention of Constipation and Maintenance of Patterns of Normal Bowel Elimination***

Dietary adjustments are advocated as the first line of defence followed by a combination of diet and exercise for the treatment and prevention of constipation and the maintenance of normal bowel function. However, correction of the underlying abnormality is essential in avoiding further episodes. Successful treatment should include discussion concerning the person's expectations and conceptions regarding the broad range of normal stooling function (Schaefer & Cheskin, 1998). Much of the literature identifies that constipation should be effectively treated with a "combination" regimen consisting of dietary components, regular toileting time, exercise and if necessary medication use (Allison, Porter & Briggs, 1994; Benton, O'Hara, Chen, Harper & Johnston, 1997; Beverley & Travis, 1992; Gibson, Opalka, Moore, Brady & Mion, 1995).

Once the acute episode of constipation is relieved, the focus should necessarily shift from treatment to prevention of constipation and protection or maintenance of normal patterns of bowel elimination through the incorporation of preventive self-care health practices (Beers & Berkow, 1999; Benton, O'Hara, Chen, Harper & Johnston, 1997; Hogstel & Nelson, 1992; Yakabowich, 1990; Yakabowich, 1992).

There is a wide range of pharmaceuticals available for the treatment of symptoms of constipation. Use of, particularly bulk laxatives, to deal with the symptoms of constipation are cited in the literature as a second line of defence followed by other laxative preparations (Abyad & Mourad, 1996; Kennedy-Malone, Fletcher & Plank, 2000; Kenney Weeks, Hubbartt & King Michaels, 2000; Yakabowich, 1990, 1992). Other modalities of treatment include bowel retraining, stimulants and cathartics, enemas or suppositories as well as alternative therapies. There is much which influences how people choose to manage the issue of constipation in their own lives. Tradition, culture and simple expectations of "what is normal" all come into play (Powell & Rigby, 2000).

In the following paragraphs brief descriptions of treatment modalities for both prevention of constipation and maintenance of normal bowel patterns are provided. These include bowel retraining, diet and exercise, pharmaceutical preparations (laxatives including stool softeners, enemas and suppositories, stimulants and cathartics) and alternative or complimentary modalities (aromatherapy, herbs, homeopathy, biofeedback, abdominal wall massage and acupuncture).

### ***Bowel Retraining***

Bowel retraining is essentially behaviour modification. It is important to have a daily routine incorporating time for a bowel movement. Taking advantage of the

gastrocolic reflex, which is “usually well preserved in the non-diabetic older adult” (Harari et al., 1995, p. 7) and which occurs anywhere from five to 45 minutes following a meal is preferable. Moving the bowels at the same time everyday following breakfast is optimal. A regular unhurried routine encourages attention and response to defecation urges (Abyad & Mourad, 1996; Beers & Berkow, 1999; Kenney Weeks, Hubbartt, & King Michaels, 2000; Schaefer & Cheskin, 1998).

### *Diet*

Diet is believed to be a critical element in bowel function especially in the North American population, which is generally more sedentary in their lifestyle and consumes little daily fibre (Burkitt, 1982; Burkitt & Meisner, 1979). Traditionally, fibre and fluids have been thought to contribute to normal bowel function in the adult population however there is controversy as to its importance in the older adult population (Rimon & Levy, 2000). Dietary fibre intakes as well as fluid intake have been described as having “an indeterminate effect on bowel habit ” as studies with increases in fibre and fluid have reported conflicting results where whole gut transit times were improved or unchanged. (Abyad & Mourad, 1996, p. 29). Donald, Smith, Cruikshank, Elton and Stoddart (1985) report they could not find a correlation between dietary fibre intake and symptoms of constipation within their sample of 219 older community dwelling adults. Similarly, Campbell, Busby and Horwath (1993) did not find low intakes of dietary fibre to be associated with an increase in occurrence of constipation in their sample of elderly persons aged 70 years or greater (N= 856). In contrast to this, Schaefer and Cheskin (1998) report that “[there is] strong epidemiologic evidence [which shows that] greater amounts of crude dietary fibre is associated with lesser prevalence of constipation and

other GI disorders including diverticular disease and colorectal cancer” (p. 912). Many studies have indicated that fibre appears to increase stool bulk, weight and to speed up the time it takes stool to pass through the intestinal tract (Cheskin, Kamal, Crowell, Schuster & Whitehead, 1995; Johnson, Roth, Reinhardt & Marlett, 1988; Smith, Rowe, Smith, Eastwood, Drummond & Brydon, 1980).

Schaefer and Cheskin (1998) identify three mechanisms that may account for their study outcome. 1) Fibre may act as a bulk-forming agent. Beers & Berkow (1999) suggest that vegetable fibre due to its largely indigestible and unabsorbable nature is responsible for adding bulk to stools. As well, other components of fibre may also absorb fluid into the solid phase of stool production thus facilitating passage of stool through the intestines. 2) Fibre may bind fecal bile salts, which have a pronounced cathartic effect. 3) Fibre is metabolized by colonic bacteria to nonabsorbable, volatile fatty acids, which may act as an osmotic cathartic.

Andersson, Bosaeus, Falkheden & Melkersson (1979) studied the effects of bran and a bulking pharmaceutical agent in a group of 10 constipated geriatric clients. They found that the bran decreased the mean transit time significantly more than the pharmaceutical bulking agent and fewer additional laxative preparations were required when bran was the mainstay of prevention. In contrast to this Snustad and colleagues (1991) could find no beneficial effect of fibre supplementation when provided for 3 weeks in a geriatric acute-care setting. Despite the varied research findings, the American Dietetic Association (2000) strongly promotes the use of dietary fibre as a laxation agent suggesting that it has “been used to treat constipation and promote laxation for thousands of years” (p. 4). The literature varies in its recommendations regarding the amount of

daily fibre in one's diet. 16 to 20 grams (2-3 teaspoons twice or three times daily) of unrefined miller's bran is recommended by Beers and Berkow (1999) whereas the Niedert (1998) suggests 20-35 grams of fibre daily is optimal. Niedert (1998) further indicates that coarse wheat bran produces the greatest bulking capacity. Other literature sources indicate anywhere from a low of 18 grams daily to a high of 50 grams of daily dietary fibre is recommended (Benton et al., 1997; Brown & Everett, 1990; Burkitt, 1982; Cheskin et al., 1995; Holthausen, 1998; Peckenpaugh & Poleman, 1995).

While addition of fibre rich foods into a diet may help to maintain bowel regularity and alleviate constipation concerns, one must also be cognizant that the fibre itself may contribute to constipation if adequate fluid intake is not maintained. Inadequate fluid intake may further contribute to constipation. This holds even more truth for the person who is taking a diuretic medication. As long as there is no cardiac or renal problem wherein a restricted fluid intake level is essential, the general guideline for adequate daily fluid intake is eight 8-ounce glasses of water or other non-caffeinated fluid. (Abyad & Mourad, 1996; Beers & Berkow, 1999).

### *Exercise*

In regards to exercise, Campbell, Busby and Horwath (1993) found that those who were less physically active had less frequent bowel movements. Likewise, Donald, Smith, Cruikshank, Elton and Stoddart (1985) in a cross-sectional study of 219 community dwelling older adults and Kinnunen (1991) in a cross-sectional survey of 214 community dwelling older adults, both noted a significant association between constipation and poor mobility. Gradual initiation of mild daily exercise, particularly walking, has been suggested to contribute to improved bowel regularity when used in

combination with diet and fluids (Abyad & Mourad, 1996; Beers & Berkow, 1999; Kenney Weeks, Hubbartt & Michaels, 2000). A study by Bingham and Cummings (1989) studied 14 healthy 22-34 year olds. Exercise had a marked effect on physical fitness but no consistent effect was found on the large bowel function. Bradford and Dunbar (1987) were able to show that attention to diet, fluids and daily exercise was effective in maintaining spontaneous bowel function without the use of laxatives in a community dwelling older woman who had abused laxatives and enemas for five years. No studies were found that specifically tested a long- term exercise regimen alone on the bowel functions of the elderly.

### ***Pharmaceutical Management of Constipation and Maintenance of Normal Bowel***

#### ***Elimination: Laxatives***

Laxatives have, for some, become the mainstay for the treatment of constipation symptomology. Pharmaceutical companies offer more than 700 commercially available products which produce a laxative effect (Abyad & Mourad, 1996; Schaefer & Cheskin, 1998). With the availability of these products both the public at large and medical professionals tend to rely on these as the primary method to manage constipation. Koch and Hudson (2000) report that in 1993 over 10 million prescriptions for laxatives were written in the UK. In a study by Stoehr and colleagues using a sample of over 1000 older adults, 10% reported taking laxatives as a self-prescribed over-the-counter item (cited in Koch & Hudson, 2000, p. 518). Unfortunately these products are not side effect free and should be used with caution. Laxatives must be used with caution as they may interfere with the absorption of other medications (Beers & Berkow, 1999; Yakabowich, 1990; Yakabowich, 1992). Laxatives may bind with other medications both chemically



(tetracycline, calcium and phosphate) or physically (digoxin on cellulose matrices) and interfere with their intended actions (Beers & Berkow, 1999, p. 279). The increased speed of stool transit due to laxative use may cause some drugs and nutrients to be rushed and their optimal absorption lost (Beers & Berkow, 1999).

There are generally four categories of laxative preparations available. These include bulking agents (eg. Metamucil), osmotic or saline agents (eg. Lactulose, magnesium hydroxide otherwise known as Milk of Magnesia), stimulants (castor oil, senna, cascara, bisacodyl, phenolphthalein) and softeners or emollients (eg. Mineral oil, docusate salts, Liquid paraffin, arachis oil, Coloxyl) (Koch & Hudson, 2000; Lederle, 1995; Yakabowich, 1990).

Beers & Berkow (1999) indicate that the only laxatives recommended for long-term use include bran, psyllium, calcium polycarbophil and methylcellulose. Their safety is in their slow and gentle action. As noted earlier, proper maintenance of daily fluid intake is required with the use of these in order to avoid impaction due to bulking agents. Castle and colleagues (1991) indicate that the use of stool softeners as a mode of prevention is questionable. In their study of 22 elderly volunteers no difference between the effects of the stool softener Docusate Sodium and a placebo was found. The frequency of bowel movements was the same with the use of both substances. Much of the medical literature indicates that use of bulk laxatives to manage the symptoms of constipation should be a secondary method of treatment followed lastly by the use of other laxative preparations. Dietary methods and exercise are advocated as first line management techniques (Abyad & Mourad, 1996, Castle, 1989; Cummings, 1994; Kenney Weeks, Hubbartt & King Michaels, 2000; Rimon & Levy, 2000).

### ***Enemas and Suppositories***

Enemas and/or suppositories may be required to aid the chronically constipated person in stimulating the urge to defecate. The enema or suppository works by distending the rectal ampulla that stimulates the defecatory urge and process. To avoid irritation and inflammation of colonic mucosal repeated use of these interventions should be avoided (Spencer, Nichols, Lipkin, Sabo & West, 1989).

### ***Stimulants and Cathartics***

Senna and its derivatives cascara, phenolphthalein, bisacodyl and castor oil are often used to cleanse the bowel. They act by irritating the mucosal lining or by directly stimulating the submucosa and myenteric plexus. Peristalsis and intraluminal fluid are increased thus facilitating the passage of stool (Beers & Berkow, 1999, p. 282). There are side effects that can occur with the use of these products. Anthraquinone derivatives can cause melanosis coli and can cause permanent damage to the myenteric plexus. Phenolphthalein has been linked to dermatitis, photosensitivity reactions and Stevens-Johnson syndrome (Abyad & Mourad, 1996; Beers & Berkow, 1999). Castor oil inhibits glucose and sodium absorption and stimulates water and electrolyte secretion thus placing the person at risk of fluid and electrolyte disturbances (Abyad & Mourad, 1996; Beers & Berkow, 1999; Lisi, 1994).

### ***Alternative or Complimentary Modalities***

The terms complementary medicine or alternative therapy are used in the literature. These terms can apply to systems of care such as acupuncture, chiropractic, homeopathy, massage therapy, naturopathy, biofeedback, energy feedback and aromatherapy (Ness, Sherman & Pan, 1999). As well, these terms can be used to signify

dietary supplements such as St. John's Wort, Ginkgo biloba, Echinacea, Garlic, Ginseng, Kava and Saw palmetto (Ness, Sherman and Pan, 1999). A study investigating the use of alternative medicine in the United States indicates that the overall use of alternative or complimentary therapies has increased by 25% since 1990. In 1990 an estimated 3 out of 10 persons used alternative methods for treatment and therapy. In 1997 the rate was 4 out of 10. Thirty five percent of the respondents in the American survey were over 50 years of age. Massage, chiropractic, hypnosis, biofeedback and acupuncture were the top five therapies utilized (Anonymous, 1999). Alternative therapies are used for a variety of health related concerns including constipation.

Fontaine (2000) specifically identifies several alternative therapies that are reportedly helpful for relief of constipation. These include aromatherapy (massage the abdomen with orange, black pepper, ginger or marjoram mixed in a carrier oil in a clockwise direction); herbs (dandelion root, chicory root, angelica root-20 to 30 drops of extract in a small glass of water 3 times a day), cascara sagrada, senna; psyllium-only to be used for several days as long-term use can be damaging. Homeopathy: bryonia (wild hops) or nux vomica-1 tablet 3 times daily for a maximum of 1 week (p. 414). There are numerous self-help books in any bookstore which identify herbs and supplements that are touted as effective for maintaining normal bowel function or dealing with constipation if it is present. The researcher was unable to find any published studies that investigated the claims made by this literature.

### ***Biofeedback***

Biofeedback training specifically targeting those with constipation was undertaken in a study by Lennard-Jones and colleagues (1994). The outcomes showed

that nearly half of the subjects experienced an improvement in their symptoms of abdominal bloating and pain with an average of two to six outpatient sessions. Bowel movement frequencies increased and straining and laxative use stopped or was significantly decreased with the use of biofeedback techniques. These improvements reportedly persisted between 6 to 12 months (Lennard-Jones, 1994). In a study by Karlbom and colleagues (1997) 43% of subjects aged 22 to 72 years had successful alleviation of symptoms, increased bowel movement frequencies and reductions in laxative use for up to one year following 8 outpatient biofeedback sessions. Patankar and colleagues (1997) also studied a group of 30 patients ages 33-86 who had chronic constipation and who used biofeedback as a treatment. Significant results suggest that this modality is promising for treatment purposes. A number of other studies further suggest positive results using biofeedback techniques can be achieved (Gilliland, Heymen, Altomare, Park, Vickers & Wexner, 1997; Glia, Gylin, Gullberg & Lindberg, 1997; Kawimbe, Papachrysostomou Binnie, Clare & Smith, 1991; Koutsomanis, Lennard-Jones, Roy & Kamm, 1995).

In contrast to these Reiger and colleagues (1997) found that out of 19 patients (aged 16-78) only 2 had an improvement of greater than 50% in their symptoms following a series of six out-patient biofeedback sessions. This group of researchers did not support the use of biofeedback as a treatment modality for constipation.

#### ***Abdominal Wall Massage & Acupuncture***

Propulsive abdominal wall massage has been examined as a possible treatment modality for constipation. In a study by Klauser and colleagues (as reported by Lennard-

Jones, 1994) this treatment was not successful in reducing symptoms or increasing colonic transit time. In the same study acupuncture was also found to be ineffective.

### *Section Two: Self-Care*

Self-care is as ancient as man himself. From his earliest beginnings, man has taken responsibility for his own safety and those in his group or family. Man has used remedies and treatments handed down from generation to generation to treat and cure (Levin, 1977; Steiger & Lipson, 1985; Woods, 1989). Some popular lay remedies in use today are a blend of wisdom passed down from generation to generation with formal knowledge supported by scientific evidence. For example, liquorice root has been used as a digestive aide and laxative for many years. Contemporary science has recently shown that a substance in the root known as “carbenoxolone” protects the lining of the stomach from stomach acid (Segall and Chappell, 2000, p. 99).

At first glance self-care appears to be a straightforward and simplistic concept. It appears to mean the activities and practices undertaken by a person on their own behalf to combat or avoid an illness or simply to maintain or improve one’s health (Leventhal, Leventhal & Robitaille, 1998; Woods, 1989). Self-care appears to encompass “many routine everyday health care activities that lay people undertake to manage their personal and family health concerns” (Segall & Chappell, 2000, p. 131). Despite this seemingly clear and unencumbered view of self-care the concept is much more complex once one delves into the literature. Self-care in fact is defined in many different ways in the literature and as such it is difficult to compare the literature on the concept. One of the difficulties is that there are numerous terms, definitions and domains identified with the concept of self-care.

The literature is not consistent with the terms used. Words used synonymously with self-care include self-help, self-monitoring, health maintenance, health promotion, self-health maintenance, self-management, self-surveillance, self-treatment; self-regulation; health self-care, informal care, lay care, preventive health care and medical self-care (Chang, 1980; Dean, 1981, 1986; Easton, 1993; Ecock Connelly, 1987; Haug, Wykle & Namazi, 1989; Hickey, 1986; Konrad, 1998; Leventhal, Leventhal & Robitaille, 1998; Levin, Katz & Holst, 1979; Mockenhaupt, R., 1993; Morrongiello & Gottlieb, 2000; Palo Stoller, 1998; Segall & Chappell, 2000; Segall & Goldstein, 1986; Shapiro & Havens, 2000).

Various definitions of self-care have been put forward in the literature. The scope and content of the definitions vary with the authorship. The backgrounds of the writer, their discipline, professional goals, special interests and political orientation certainly have an impact upon how the concept is defined (Levin, Katz, & Holst, 1979). The World Health Organization (WHO) broadly defined self-care some time ago as "...the activities individuals, families and communities undertake with the intention of enhancing health, preventing disease, limiting illness, and restoring health. These activities are derived from knowledge and skills from the pool of both professional and lay experience. They are undertaken by lay people on their own behalf, either separately or in participative collaboration with professionals" (WHO, 1983 as cited in Morrongiello & Gottlieb, 2000, p.33). Similarly, Chappell, Strain and Badger (1988) also define self-care as any behaviour which is preventive or maintenance oriented as well as illness focused. These researchers however limit the involvement of professionals in the concept of self-care. They in fact suggest that self-care is any behaviour in health and illness which does not

involve health professionals. More recently, Leventhal, Leventhal and Robitaille (1998) identified self-care as “anything a person does on one’s own or in collaboration with friends and/or family to improve health and prevent, treat and rehabilitate from both acute and chronic illnesses. It includes how one makes decisions to seek professional care and what one does to adhere to or deviate from the regimens recommended” (p. 136).

Dean (1986) defined self-care as “...the range of activities individuals undertake to enhance health, prevent disease, evaluate symptoms and restore health. Lay people on their own behalf undertake these activities, either separately or in participation with professionals. Self-care includes decisions to do nothing, self-determined actions to promote health or treat illness, and decisions to seek advice in lay, professional and alternative care networks, as well as evaluation of and decisions regarding action based on that advice” (p. 62). This definition is very similar to the one utilized by the Honourable Canadian Minister of Health and Welfare Jake Epp in his landmark 1986 document *Achieving Health for All: A Framework for Health Promotion*. Self-care was defined in this document as “...the decisions taken and the practices adopted by an individual specifically for the preservation of his or her health” (Epp, 1986, p. 13).

From the previous discussion self-care appears to mean taking care of oneself by taking measures, however primitive or elaborate they might be, to deal with illness, promote health and prevent future episodes. Self-care includes activities undertaken with or without lay and/or professional assistance. Self-care includes actions undertaken based on personal experience and knowledge gained from life. Inherent in self-care is the idea that it is a conscious, deliberate action and it is learned through culture and habit (Easton, 1993). The emphasis lies within the decision-making and the control of the actions. Self-

care is self-initiated, self-determined and self-managed (Chang, 1980; Easton, 1993; Fontaine, 2000; Morrongiello & Gottlieb, 2000; Woods, 1989; Segall & Goldstein; 1986).

As identified earlier self-care is not a new phenomenon. For generations our early forefathers and foremothers took care of their ailments and afflictions by using therapies that were learned from previous generations. The therapies were based on health systems of ancient peoples including Egyptians, Chinese, Asian Indians, Greeks, Native Americans and Native Canadians (Fontaine, 2000). With the medicalization of health care in the 1950's and 60's self-care was characterized as unacceptable and treated as "fringe" behaviour (Morrongiello & Gottlieb, 2000, p. 34). Failure to make use of the health care system and to participate in lay care which used home remedies and self-medication was stereotyped as misinformed, dangerous and in need of education by professionals to correct and enlighten with respect to health (Konrad, 1998; Levin, Katz & Holst, 1979; Morrongiello & Gottlieb, 2000; Shapiro & Havens, 2000).

In the 1970's and 1980's the literature identified self-care as a social movement or social phenomenon (Dean, 1986; Konrad, 1998; Levin, Katz & Holst, 1979; Morrongiello & Gottlieb, 2000; Segall & Chappell, 2000; Shapiro & Havens, 2000). A natural movement is believed by some to have been occurring apart from the formal health care system. It has been suggested that the self-care movement has existed all along but was not formally acknowledged as worthy of study and therefore had gone unnoticed (Konrad, 1998).

Self-care in health has been the topic of many an investigation in the medical, social and nursing sciences. Self-care can be arguably identified as a concept embedded



within the concepts of health promotion, health maintenance, health protection and illness prevention. Health promotion and illness prevention are used interchangeably in much of the literature however they are in fact separate and distinct. Pender (1996) identifies that there is a necessary distinction between the two. Health promotion is action directed toward increasing the level of well-being and self-actualization of individuals and groups whereas prevention or protection is action directed at decreasing the probability of experiencing health problems (Pender, 1996). Harris and Guten (1979) further define health protective behaviour as “any behaviour performed by a person, regardless of his or her perceived or actual health status, in order to protect, promote, or maintain his or her health, whether or not such behaviour is objectively effective toward that end” (p. 18). In both these definitions the person undertakes the action by and for him or her self. As such it is argued that self-care is necessarily involved in the concepts of health promotion, health maintenance, health protection and illness prevention (Harris & Guten, 1979; Mikhail, 1981; Morrongiello & Gottlieb, 2000; Woods, 1989).

### ***Theories of Health Behaviour***

Understanding the nature of health behaviour is important if nurses and other health professionals are to work in collaboration with clients to promote successful illness prevention, health maintenance and health promotive activities. Examination of the predisposing characteristics of individuals and precipitating effects of personal, social and physical environments of people in relation to prevention and protective health behaviour activities is necessary for comprehension of client health behaviour activity and effective intervention by health professionals (McCance & Eliason Reiber, 1982).

In order to productively investigate this type of information it is essential to utilize a conceptual model. Conceptual models assist researchers in explaining the circumstances under which health behaviours are chosen (Kart & Engler, 1995). Over the years many scientists have formulated theories and models that interrelate various variables for discerning patterns in health activities to assist in explaining health behaviours. Historically, studies considered the active participation of clients in the process of health care to be limited to compliance with medical directives. A shift in focus from professional service utilization toward a study of self-medication, self-care behaviours and the role of the family in health maintenance has removed part of the professional bias which may have obscured the objective study of self-care health behaviour(s) in the past (Dean, 1981).

To effectively study how individuals respond to conditions or threats of conditions, which negatively impact upon their health, an understanding of their social and economic circumstances as well as personal characteristics and health beliefs need to be examined. There have been theoretical models put forth for this purpose by a variety of professional backgrounds including nursing and the social sciences. The models vary, however, in their scope, comprehensiveness and utility. In the following two sections several theories will be outlined and examined in light of the purpose of this thesis research. There are a number of nursing models that have been used to study health behaviours in the literature. These include the Neuman Systems Model and Orem's Theory of Self-Care. These will be discussed in the first section. Subsequent to this social psychological theories used in health behaviour research will be examined and

discussed. These include the Theory of Reasoned Action, the Transtheoretical Model of Health Behaviour Change and the Social Learning Theory.

### *Nursing Theories of Health Behaviour*

#### *The Neuman Systems Model*

The Neuman Systems Model is a comprehensive systems-based conceptual model, which links clients, their environment, health and nursing. It is based on the concepts of stress and the reaction to stress (Neuman, 1989). It is a very broad nursing model that incorporates primary, secondary and tertiary prevention as nursing intervention (Fawcett, 1995). Purposeful intervention by the nurse in order to mitigate or reduce stress factors and adverse conditions, which impact on the client's functioning, is the focus of the model (Suggs Chance, 1982). As a systems-based model the goal is to achieve, maintain and promote the client's stability. As such it is a reactionary model that fails to look at the motivation behind why people behave as they do. Consequently it was not considered appropriate for the work of this thesis wherein the focus lies not on what the nurse should do or suggest but rather on examination of what factor(s) influence and impact on an elderly person's choice of health practice(s) for maintenance of normal bowel functioning and prevention of constipation.

#### *Orem's Theory of Self-Care*

A second nursing theory, Orem's Theory of Self-Care, has been described as the pioneer in self-care theory in nursing (Steiger & Lipson, 1985). It is a nursing model that was conceptually not empirically derived (Fawcett, 1995; Morrongiello & Gottlieb, 2000). It is an intense outline of what constitutes the philosophical and technical nature of nursing practice and contains language that is challenging to comprehend (Fawcett, 1995;

Hill & Smith, 1990; Orem, 1980; Orem, 1985; Steiger & Lipson, 1985). Fawcett (1995) and Morrongiello and Gottlieb (2000) identify that Orem's Theory of Self-Care is most useful in research pertaining to managed care environments where the effects of nursing care on health behaviour management are to be examined. Other concerns with Orem's theory include both the lack of conceptual definitions and the lack of linkages between the concepts themselves. Because of these concerns, the Theory of Self-care by Orem was not chosen as the theoretical basis for this thesis.

### ***Social & Psychological Theories of Health Behaviour***

In the social and behavioural sciences there are frameworks that describe and explain the conditions under which people are more or less likely to care for themselves, undertake changes in their health behaviours and which suggest factors that play a role in facilitating health behaviours. Woods (1989) suggests that these models have in fact been used to study the concept of self-care behaviours however few investigators have used the term "self-care" in their work. These frameworks include the Theory of Reasoned Action; the Transtheoretical Model of Health Behaviour Change; Social Learning Theory and the Health Belief Model. Brief discussions of each of the first three models are found in the following paragraphs. Subsequent to this a more in-depth review of the Health Belief Model will be undertaken in chapter three.

### ***The Theory of Reasoned Action***

The Theory of Reasoned Action by Ajzen and Fishbein suggests that behaviour can be accounted for by a combination of attitudes about an action and perceptions of likely reactions to that action (Becker, 1990). This theory is a value-expectancy theory. It is used to "predict a person's intention to perform a behaviour in a well-defined setting"

(Carter, 1990, p. 68). The Theory of Reasoned Action has focus on behaviour change. The intent of the theory is to differentiate “people who have successfully accomplished a behaviour change from those who have not” (Carter, 1990, p. 84). The theory is future oriented as it focuses on behaviours which are not currently employed but which may be employed in the future (Carter, 1990; Godin & Kok, 1996). Intention in this model is the primary determinant of any health behaviour and as such all other factors are mediated through it (Carter, 1990). The theory incorporates the importance of attitudes and subjective norms of behaviour however it fails to include factors such as economics and environmental factors that also are known to influence health behaviour. A further limitation of the Theory of Reasoned Action is that evaluation has been limited to college-aged students. It has not been utilized with older populations (Becker, 1990). In light of its limited scope, lack of use with older aged populations and necessary future orientation the Theory of Reasoned Action is rejected as a guide for this thesis work.

### ***The Transtheoretical Model of Health Behaviour Change***

The Transtheoretical Model of Health Behaviour Change developed by James Prochaska identifies the stages of change and how they are useful at revealing where persons are at with respect to health behaviour changes in their lives (Prochaska & Velicer, 1997). This model has proved its ability to determine which psychosocial and perceptual factors are most critical for moving an individual from one stage to another in regards to assisting individuals to change their unhealthy or high-risk habits (Prochaska & Velicer, 1997; Prochaska, 1998). Although it is important to understand where persons are in the continuum of behaviour change, this theory is believed not to be applicable to the proposed investigation of what factors help to establish current health behaviour(s).

### *Social Learning Theory*

The Social Learning Theory by Albert Bandura posits that for individuals to engage in specific health behaviour activities they must have some degree of self-efficacy (Becker, 1990; Prohaska, 1998; Strecher, McEvoy, DeVellis, Becker & Rosenstock, 1986). Persons must believe that they possess the necessary skills to undertake the behaviour. Leventhal, Leventhal and Robitaille (1998) suggest that this theory is best utilized in "...situations involving the replacement of undesirable, automatic behaviours with healthy, but complex and difficult to learn behaviours" (p. 119). Examples of such behaviours include smoking cessation, cardiovascular fitness programs and management of chronic arthritis. Admittedly self-efficacy is influential in the choice and implementation of health behaviours. However since the focus of this model is primarily on behaviour change it is deemed theoretically and conceptually unsuitable for this thesis investigation.

### *Summary*

In the preceding chapter a review of the literature pertaining to normal bowel function, age related changes and treatment modalities related to prevention of constipation and maintenance of normal bowel function was undertaken. In the second section the concepts of self-care and health behaviour were reviewed and various conceptual models used to study health behaviour were examined.

### **Chapter Three Conceptual Model**

The Health Belief Model (HBM) was the framework chosen to guide the development and analysis of this thesis research. In the first section of this chapter a review of the literature as it applies to the history of the HBM, its dimensions and its use in the explanation and understanding of health behaviours will take place. In the second section a discussion of the dimensions of the HBM and variables to be investigated in this thesis research study are outlined.

#### ***History of the Health Belief Model***

The HBM was originally created in the 1950's by a group of social psychologists G. Hochbaum, S. S. Kegeles, H. Leventhal and I. M. Rosenstock to provide a framework for the study of why people did not participate in the large-scale health prevention programs of the day (Rosenstock, 1974). The HBM is built upon a combination of the behavioural stimulus response theory and cognitive value expectancy theory. According to behavioural stimulus response theory, learning behaviour results from the outcomes of events. If the outcomes are favourable the behaviour(s), which produced the outcomes, will be remembered and repeated. The cognitive portion of the theory suggests that the subjective value attached to an outcome is combined with a subjective expectation that certain behaviour(s) will produce a certain outcome.

The HBM suggests that the likelihood of action is based upon the interplay of the value an individual attaches to a goal and the individual's perceptions regarding the likelihood of achieving the goal utilizing certain behaviours or actions (Duncan & Travis, 1998; Becker, 1990). Thus, if positive expectations are linked to and reinforced by certain behaviours then the behaviours will be continued because the expectation has been

proved valid (Maiman & Becker, 1974; Rosenstock, 1990). More simply stated, the HBM attempts to explain action in a choice situation as it relates to an individual's decision about possible health behaviours. It assumes that self-care health behaviours are due to subjective perceptions and that individuals have some volitional control over their behaviour (Prohaska, 1998). As such the HBM attempts to explain health-related behaviour at the individual decision-making level (Mikhail, 1981).

The HBM has emerged as one conceptual framework used over many years across the health continuum from prevention, protection and health maintenance to detection of illness and sick role behaviour (Becker, 1990; Becker, Drachman & Kirscht, 1974; Harris & Guten, 1979; Heinzelmann, F., 1962; Janz & Becker, 1984; Kegeles, 1963; Mikhail, 1980; Palo Stoller, 1998; Rimer, 1990; Rosenstock, 1990; Woods, 1989). It has been used to investigate a broad range of health behaviours such as breast self examination (Champion, 1985; Lashley, 1987; Lauver, 1987; Wyper, 1990), beliefs regarding breast feeding (Sweeney & Gulino, 1987), protective and preventive health behaviours (Dolman & Chase, 1996; Glanz, Lew, Song & Cook, 1999; Grubbs & Tabano, 2000; Harris & Guten, 1979; Vaughan, 1993), medical regimen compliance (Becker, Maiman, Kirscht, Haefner & Drachman, 1977; Maiman, Becker, Kirscht, Haefner & Drachman, 1977) and health behaviour and cancer (Ramirez Smiley, McMillan, Johnson & Ojeda, 2000). The HBM has continually been shown to be valid and reliable in studies conducted by a variety of health related professionals including psychologists, physicians, nurses and dentists (Rimer, 1990). It is evident that the HBM is a model that has influenced and guided much of the self-care literature despite the fact



that “few [investigators] have used the term “self-care” in their work” (Woods, 1989, p. 3).

In an extensive review of 46 studies (28 of the studies were retrospective in design) that utilized the HBM as their conceptual framework, Janz and Becker (1984) found substantial empirical evidence supporting the contribution of the HBM concepts in explaining and predicting health-related behaviours. The HBM has been identified as the most efficient and practical model requiring the least number of questions to evaluate its concepts (Harrison, Mullen & Green, 1992; Mullen, Hersey & Iverson, 1987). Its intuitive logic and clearly stated tenets allows for various methods of inquiry ranging from personal interview to large population based surveys (Rimer, 1990). A criticism of the model is that the focus on beliefs limits the scope of the model, as behaviour cannot always be accounted for on this basis. Various researchers have suggested other variables such as general health motivation, self-efficacy, health locus of control and a measure of social networks, be added to the model to improve predictiveness and utility (Becker, 1974; Burns, 1992; Mullen, Hersey & Iverson, 1987; Rosenstock, 1990; Rosenstock, Strecher & Becker, 1988).

### ***The Health Belief Model and the Maintenance of Normal Bowel Elimination and Prevention of Constipation***

The following section will describe the components of the HBM that will be considered for this thesis. Discussion concerning the research that has used these variables in the past as they relate to normal bowel functioning and constipation will take place. Belief factors, which will be discussed, include perceived susceptibility, perceived seriousness as well as perceived benefits and perceived barriers to action. In addition the

modifying factors of demographic variables, sociopsychological and structural variables as well as cues to action factors will be addressed.

The HBM suggests that health behaviour is related to the individual's beliefs or perceptions as they relate to perceived susceptibility, perceived severity, perceived benefit, and perceived barriers. A visual depiction of the HBM is provided on page 49.

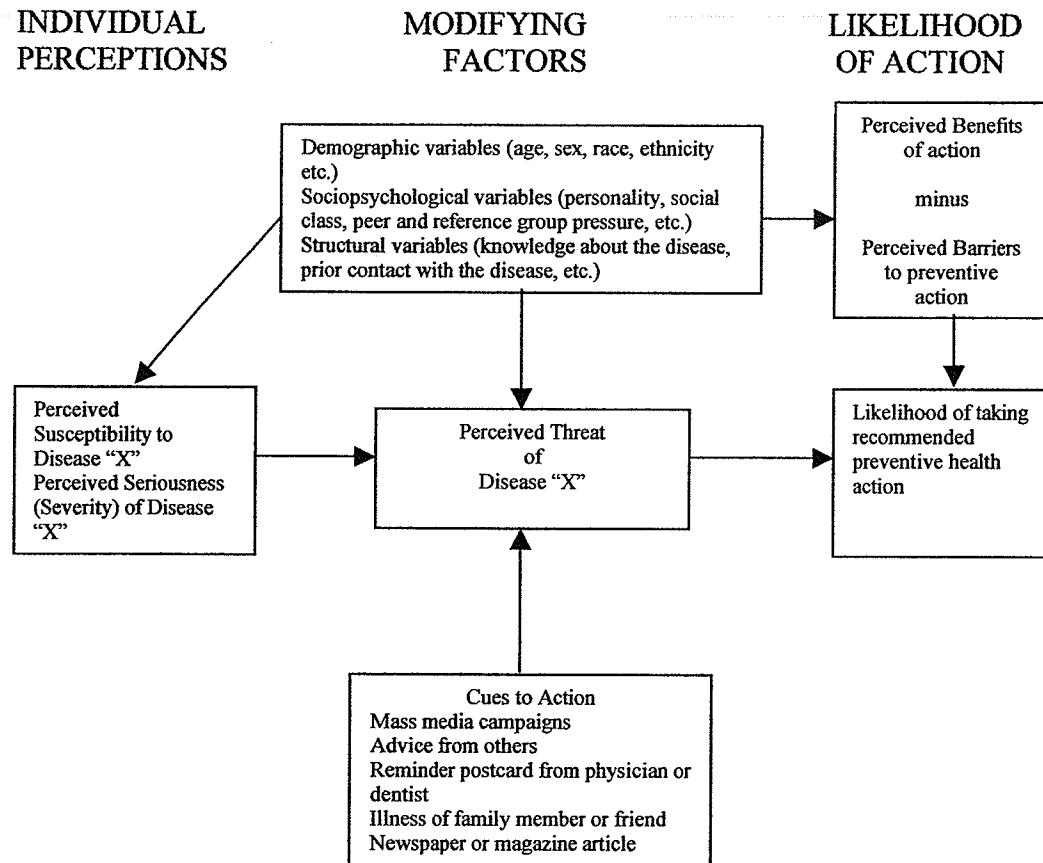
### ***Perceived Susceptibility***

Perceived Susceptibility relates to an individual's subjectively perceived risk of experiencing or re-experiencing a certain health condition, problem or illness resulting in harm if no action is taken (Janz & Becker, 1984; Rosenstock, 1974, 1990; Weinstein, 2000). People who perceive a value to reducing the threat will engage in behaviour to ensure this (Harris & Guten, 1979).

### ***Perceived Severity***

Perceived Severity relates to an individual's subjective evaluation of the threat or seriousness of a health condition (Janz & Becker, 1984; Rosenstock, 1974, Rosenstock, 1990). It includes an individual's evaluation of the seriousness of the harm to be experienced if a condition, problem or illness is contracted and is left unattended or steps to prevent it are not taken (Weinstein, 2000). In a study of American university students, new hospital employees and second year medical students (N= 566) perceived severity of bowel symptoms was found to be a factor influencing health behaviour leading to medical consultation (Sandler, Drossman, Nathan & McKee, 1984).

Figure 1

*The Health Belief Model*

(Rosenstock, 1974, p. 7).

### ***Perceived Benefits & Barriers***

Perceived Benefit relates to an individual's evaluation of the benefit, feasibility and effectiveness of engaging in a certain health action(s) to reduce the seriousness or threat. Undertaking a certain health action depends on the person's beliefs regarding the effectiveness of the various courses of action (Janz & Becker, 1984; Rosenstock, 1974; Rosenstock, 1990). Perceived Barriers relates to an individual's evaluation of the potential drawbacks of engaging in certain health actions(s) to reduce the threat (Janz & Becker, 1984; Rosenstock, 1974; Rosenstock, 1990). These barriers could include but are not limited to such things as inconvenience, expense, unpleasantness or pain associated with proposed health actions. A type of "cost-benefit" analysis is believed to occur wherein the benefits and barriers to action are weighed against each other. If an individual believes that certain health behaviour(s) will reduce the threat or minimize the impact of the problem and the drawbacks to use are limited then the health behaviour(s) will be undertaken (Harris & Guten, 1979). As such the combined levels of susceptibility and severity provides the impetus to act and the perception of benefits less the barriers provides a path for health behaviour action (Rosenstock, 1974; Rosenstock, 1990).

### ***Modifying Variables & Cues to Action***

In addition to the aforementioned concepts there are modifying variables and cues to action variables within the HBM. The literature indicates that modifying variables are thought to indirectly influence health behaviour(s). It is postulated in the literature that these factors are not related to chronological age per se, but arise from social, structural and psychological influences which combine in the personal life situations of older adults to shape health behaviours (Dean, 1992; Haug, Wykle & Namazi, 1989; Ory, DeFries &

Duncker, 1998). These include demographic variables such as age, gender, marital status, education, finances, ethnicity/culture; social psychological variables such as self-rated health, health locus of control and medical skepticism; structural variables such as functional health status and overall health status (Morrongiello & Gottlieb, 2000; Pendry, Barrett & Victor, 1998; Segall, 1987; Woods, 1989).

Cues to action variables are also believed to serve as triggers to undertake health behaviour action(s). Cues to action include internalized perceptions such as perceptions of symptoms and/or external forces like interpersonal interactions with medical professionals or one's social network and activities such as seeing or hearing media communications or reading health related literature (Mullen, Hersey & Iverson, 1987; Rosenstock, 1974; Rosenstock, 1990). Interestingly there is research that has examined some of these variables and their association with health behaviours linked with constipation. In the following paragraphs a discussion of the HBM modifying and cues to action variables will be undertaken.

### *Demographics*

#### *Gender & Age*

The literature indicates that both gender and age are important factors related to health experiences, mortality and disability. It is known that women live longer with greater morbidity than men (Verbrugge, 1978). Gender differences are also known to exist with constipation being more common in women (Campbell, et al., 1993; Harari et al., 1994; Harari et al., 1996; Johanson, 1998; Kinnunen, 1991; Sonnenberg & Koch, 1989; Talley et al., 1996).

Gender is identified in the literature as a factor that may help to discriminate patterns of health behaviour, particularly self-directed health behaviour (Dean, 1986; Kart & Engler, 1995; Palo Stoller, 1998). Both American and European studies have investigated the health behaviours of older adults and found that the majority of symptoms are not brought to the attention of medical personnel but rather are self-treated by the individual. There is controversy in the literature as to whether gender differences are evident. Some literature indicates that women are more likely than men to self-treat symptoms and report a greater variety of self-care health behaviours (Dean, 1986; Kart & Engler, 1994; Kart & Engler, 1995) whereas others suggest there is no difference between the sexes in regards to consultation for health behaviours (Chappell, Strain & Badger, 1988). In their literature review of prescription drug use in older adults, Tamblyn and Perreault (2000) noted that gender differences in use of prescription medications exist. Women have been shown to use more prescription medications than males in the middle-old and old-old years. This review did not itemize which prescription medications are more likely to be used by women. According to a review of Health Canada's 1989 National Alcohol and other Drugs Survey (NADS) Bergob (1994) indicates that 45% of senior women and 35% of senior men took blood pressure medications, while 1/3 of the senior Canadian population used prescription pain relievers. Non-prescription pain relievers were taken by 20% of women and 19% of the men surveyed. Prescription stomach remedies and laxatives were used by 14% of senior women and 9% of senior men while 6% of senior women and 4% of senior men reported taking non-prescription stomach and laxative medications.

Gender differences with respect to use of physician, hospital and ambulatory services has also been a focus in the literature. Rosenberg and James (2000) conducted a review of relevant Canadian and American literature published since 1985 and found that senior women, particularly those over 75 years of age, were among the population group who used physicians, hospitals and ambulatory care services the most. Interestingly, Strain (1991) found in her sample of older adults residing in the province of Manitoba, Canada (N=743) that males were most likely to be hospitalized when women and men were equal in levels of disability and overall health status.

Age has been shown to be a significant correlate in several studies related to health behaviours. In a study of informal networks and health beliefs in regards to use of established professional health care resources, Chappell and colleagues (1988) found that of their sample, age was the only significant predictor in the decision to utilize self-care in response to less serious symptoms like bowel irregularity. In this study Chappell and colleagues found that older respondents were more likely to engage in self-care whereas those of younger age were more likely to "do nothing" or to seek the assistance of health professionals. What actually constitutes "older" and "younger" respondents in this study is not specified. The sample was comprised of individuals aged 60 to over 90 years of age with 24% aged 60-64 years, 27% aged 65-69 years, 21% aged 70-74 years, 15% aged 75-79 years, 8% aged 80-84 years, 4% aged 85-90 years and 1% of the sample 90 years or more in age. Interestingly 70% (N=743) of the respondents indicated they used self-care as the initial response to bowel irregularity whereas 15% indicated they used professional health care in response to bowel irregularity. It is important to note that in this study self-care was distinguished as health behaviour(s) undertaken without the involvement of

health professionals in response to symptoms as well as health behaviour to maintain overall health.

Age has also been related to increased use of over-the-counter and prescription medications (Lowe & Ryan-Wenger, 1999; Tamblyn & Perreault, 2000). In 1996, 82.1% of Manitobans aged 65 years and older purchased at least one prescription medication and subsequently accounted for 34.4% of the prescription medication purchases in that province (Grymonpre, 1999). In a randomly selected sample of 665 American adults, aged 45 to 94 years, Haug and colleagues (1989) studied self-care behaviours and hypothesized that there would be age related differences among the oldest and youngest cohorts in regards to rates of self-care and the use of home remedies and over-the-counter medications. Comparisons based on the type of symptom experienced revealed over-the-counter medications for stomach, headache and bowel complaints were the self-care methods most likely to be utilized. Additionally the hypothesis that increased age would be related to the use of home remedies and that younger cohorts would be more likely to use over-the-counter medications was not upheld in this study. Various cohort differences were noted however no clear pattern of type of treatment by age cohort was found (Haug, Wykle & Namazi, 1989). In a study of over 1400 Danish adults Dean (1992) revealed that older age was associated with a greater use of medications, ameliorative activities rather than behaviours directed at the source of the problem, increased frequency of professional consultation, and "less active and preventative coping measures" (p. 39). What in fact these "less active and preventative coping measures" are is not identified. Nevertheless, the impact of age in shaping self-health care behaviour is further demonstrated by Dean's results.



### ***Marital Status***

Marital status is identified in the literature as a factor that may indirectly and directly influence health behaviour, (Fuller & Larson, 1980; Kart & Engler, 1994; Strain, 1990) however, results of the studies are somewhat inconsistent. Strain (1990) investigated the consultation patterns of a sample of 78 older community dwelling Manitobans who suffered from arthritis. Married subjects tended to consult family members with spouses being the primary source. Non-married individuals tended to consult both family and friends. Parkes (1964, cited in Fuller & Larson, 1980) found widowhood to be associated with increased physician consultation whereas Kart and Engler (1994) (N=714, aged 55 and older) found that marital status did not have a significant relationship with use of formal care (defined as physician care and prescription medication use), self-care practices (defined as the use of home remedies and over-the-counter medications as well as “doing nothing” or “waiting”) or a combination of methods (defined as some combination of professional and self-care practices). The researchers suggest that the effects of marital status in their study may have been “diminished in the presence of more detailed measures of social support” (Kart & Engler, 1994, p. S306).

### ***Education***

Education level is an element of socioeconomic status that is known to be a general determinant of health. Higher educational levels have been shown to be related to improved health status and less disability (Parker, Thorslund & Lundberg, 1994; Segall & Chappell, 2000). In the 1994 National Population Health Survey (cited in Segall & Chappell, 2000) 2% of persons with at least one university degree reported having heart

disease whereas 11.1% of Canadians with elementary schooling or less reported having heart disease. In several epidemiological studies constipation has been shown to be associated with lower education levels. Findings from four national American surveys completed yearly between 1949 and 1985 indicated that constipation was found to be more common among persons with lower socioeconomic status. Particularly, there was an increase in prevalence of constipation in those homes where education was limited (Sonnenberg & Koch, 1989).

The literature indicates that education is related to health behaviours. Increased educational attainment enhances access to and improves comprehension of information about self-care health practices (Segall & Chappell, 2000). A Danish study of 1462 randomly sampled adults found that education level was positively associated with use of non-medication based forms of self-treatment (Dean, 1986). Counter to this finding though, Kart and Engler (1994) did not find any significant relationship between education and the use of self-care measures. The researchers noted this result was “counterintuitive” as education is usually assumed to be a personal resource necessary for self-care as it is usually suggestive of “the capacity for carrying out certain self-health care behaviours” (Kart & Engler, 1994, p. S306).

### ***Income/Financial Status***

Income and poverty are identified in the self-care health behaviour literature as being associated with health status, decreased health service use by the elderly as well as impacting on the type of self-care health practices utilized by older adults (Muchow, 1993; Segall & Chappell, 2000; Wykle & Haug, 1993).

Significant correlations between low income and rates of constipation have been found by Johanson (1998) and Johanson & Sonnenberg, (1990). An inverse correlation was observed between constipation and those earning more than \$35,000 per year. Those receiving public aid were more likely to report constipation. Reasons for these correlations were not provided. Wolfson, Barker and Mitteness (1993) also found that lower socioeconomic status related significantly to constipation ( $p < 0.05$ ). Speculation could suggest several possible reasons. Persons with limited and lower incomes may have diets low in fiber due to their inability to afford the more expensive fresh fruits and vegetables thus contributing to constipation. Similarly, the methods used to prevent constipation and maintain regular bowel function may in fact be partly determined by financial status. Hodge and Ullrich (1999) and Johnson (1999) have identified that users of complementary and alternative methods/therapies (CAM) generally were in the middle to upper income classes. In their survey of older American adults ( $N=728$ ), Astin and colleagues (2000) found that 41% of the sample that utilized CAM paid an average of \$699 (out-of-pocket) each year. The average cost per visit was \$71. Consequently, those with lower incomes may be unable to utilize more costly methods that are not covered by the Canadian health care system. For example, they may be unable to participate in complementary or alternative methods/ practices (CAM) due to financial constraints.

### ***Ethnicity/Cultural Background***

Ethnicity/cultural background has been defined by Hughes and Hughes as (cited in Driedger & Chappell, 1987) "An ethnic group consist[s] of those who perceive themselves as being alike by virtue of their common ancestry, real or factitious, and who are so regarded by others" (p.2). It implies a sense of belonging to a group that holds a

common culture, beliefs and values. The ethnicity/cultural background of an individual is a variable that may be important in influencing a person's health behaviour practices and beliefs. However important this might be, there is a paucity of Canadian literature that examines the influence of cultural/ethnic background on health behaviours (Driedger & Chappell, 1987; Hawranik, 1997). The plurality of Canadians in linguistics, culture, religion and race is clearly visible today and undoubtedly contributes to the lack of research in this area. In the 1991 Canadian Census, 23.2% of Manitobans over the age of 65 identified more than one ethnic or cultural group origin. The most frequently identified groups were British, German, Polish, Ukrainian, French and "other" (which included all other specific groups none of which individually represented more than five percent of the population) (Centre on Aging, 1996).

### ***Sociopsychological Variables***

A subset of variables identified as sociopsychological variables are found within the modifying factors section of the HBM. Sociopsychological variables are influences that arise from the personal life situations and experiences of people. They are believed to indirectly influence health behaviours. Concepts such as self-rated health, health locus of control and medical skepticism are several of these sociopsychological variables. As such, self-rated health, health locus of control and medical skepticism will be individually discussed in the subsequent paragraphs.

### ***Self-rated Health***

The concept of self-assessed health status is identified in the literature as a potential determinant of health behaviour (Haug, Wykle & Namazi, 1989; Idler & Benyamini, 1997; McDonald-Miszezak, Maki & Gould, 2000; Segall, 1987). Self-rated

health has become widely accepted within the social and health sciences as a sensitive, reliable, economical and valid measure of a person's perceived health status and has been used successfully with older adults (Greiner, Snowdon & Greiner, 1996; Idler & Benyamini, 1997; Maddox & Douglass, 1973; Segall, 1987; Segall & Chappell, 2000). Idler and Benyamini (1997) found in their extensive review of 27 studies utilizing samples of community dwelling adults that self-rated health was found to influence behaviours that subsequently affect health status. In these studies it should be noted that sample sizes ranged from 421 to 6,504. As well, five of the 27 studies included older adults as well as persons under the age of 60 in their sample and all studies adjusted for age. Poor perceptions of health are thought to lead to less participation in preventive health practices and less self-care health practices (Idler & Benyamini, 1997).

In a study of bowel disorders in a random sample of 704 community dwelling older Minnesotan adults (aged 65 or older), O'Keefe and colleagues (1995) found that persons with colonic symptoms indicated poorer overall health status than did cohorts without colonic symptoms. Those with poorer overall self-rated health had visited their physician more in the previous year than those without the symptoms, even when adjusting for the number of chronic illnesses and the number of prescribed medications.

### ***Health Locus of Control***

Health locus of control is identified in the literature as a factor influencing health behaviours (Arakelian, 1980; Harper, 1984; Strain, 1991; Wallston, Strudler Wallston, & DeVellis, 1978). Health locus of control is the concept which suggests that people's beliefs about their health is influenced and controlled by one of several possible factors:

(a) powerful others in their lives; (b) self determined actions or (c) factors over which persons have little control such as fate, luck or chance (Wallston et al., 1978).

Health locus of control has been examined in a number of studies producing conflicting results. Harper (1984) found externally controlled women were more compliant with medication usage while Kirscht and Rosenstock (1978, cited in Harper, 1984) found persons expecting internal control were more compliant in medication use than those who expected external control. In their study of 714 non-institutionalized older adults ranging in age from 55 to 98 years, Kart and Engler (1994) investigated the relationship between self-care health behaviours and perceived control over health. They used a single item indicator to assess perceived control over health. These researchers found that respondents who perceived little control over their health also indicated the least amount of self-care health behaviours. Kart and Engler (1994) subsequently suggested that this group of respondents might in fact rely heavily on medical professionals and formal health services in order to effectively deal with symptoms of illness. Chappell, Strain and Badger (1988) found that older adults (aged 60 or more) with higher levels of internal locus of control are more likely to engage in self-care while those with lower internal locus of control were more likely to consult a health professional or choose to "do nothing" at the first sign of symptoms.

### ***Medical Skepticism***

The literature suggests that one's attitude concerning the efficacy of medical and physician care may influence the type of health behaviours undertaken by the older adult (Haug, Wykle & Namazi, 1989; Segall, 1987). Belief in the effectiveness of behaviours determined by ones-self without consultation with medical professionals, namely

physicians, was studied by Haug and colleagues (1989). Results from the survey of 665 older American adults residing in metropolitan and rural areas found that 61% of the sample demonstrated a low level of self-reliance in health matters and a further 69% indicated a high faith in physicians. Respondents who perceived their symptoms as more serious, demonstrated low faith in doctors, higher self-reliance and attributed their ills to aging were more likely to treat their symptoms on their own without medical consultation. No studies in relation to constipation or bowel function were found by the researcher to investigate these types of variables. However faith in personal reliance and faith in physicians may in fact influence which regimens are utilized by the older adults to maintain normal bowel function and to prevent constipation.

### ***Structural Variables***

A third subset of variables in the HBM which are believed to indirectly influence health behaviour are labelled structural variables. Structural variables are a part of the modifying factors category and help to formulate perceptions of severity, susceptibility as well as barriers and benefits associated with health behaviours. This subset of variables incorporates such things as previous knowledge or experience(s) with disease(s), functional health and overall health status. Functional and overall health status will be addressed in the following paragraphs.

### ***Functional and Overall Health Status***

In the literature, functional health is defined as the ability to function in areas of daily living including mobility, personal care and instrumental tasks which are necessary for independent living (Seigley, 1998). Functional health represents the physical capacity for role fulfillment and social involvement (Smits, 1992). It affects how persons interpret

and appraise their situations, which in turn generates support for decisions, which produces health behaviours (Seigley, 1998). Those who are chronically ill may have complex medication regimens, special diets and other regimens, which could impact on bowel function and prevention of constipation. Significant clinical and economic factors known to accompany chronic illness may impact negatively on a person's ability to achieve maximum benefits from regimens (Ecock Connelly, 1987). Interestingly limitations in mobility and activities of daily living have been associated with constipation (Campbell et al, 1993; Donald et al., 1985).

In their study of illness and maintenance health behaviours, Chappell and colleagues (1988) found in their sample of 743 older Manitobans (aged 60 and older) that those with worse health (greater numbers of chronic illnesses and greater functional disability) were the least likely to engage in self-care health behaviours particularly related to diet and exercise. Functional impairments have been found to be predictive of service use. In particular difficulties with performing activities of daily living have been found to be a significant positive predictor of nursing home, hospital and physician services use (Dunlop, Hughes & Manheim, 1997). Seigley (1998) indicates that the relationship between functional ability and health behaviours has received minimal investigation. A research study of 120 older American adults' functional health (physical activities of daily living (PADL) and instrumental activities of daily living (IADL) found that functional health made an independent contribution to explaining health behavior ( $t = 2.72, p < 0.05$ ) (Seigley, 1998). Seigley (1998) suggests the study findings support the premise that the practice of health-enhancing behaviour depends on functional health as well as the availability of services. Interestingly, in a cross-sectional study by Harari and



colleagues (1995) (N=694) of institutionalized older adults, use of laxatives to deal with constipation was correlated with poor mobility. Specifically those who were bed or chair bound were six times as likely to utilize laxatives regularly than were those who ambulated independently. The study reports that this finding has been similarly repeated in community dwelling adults.

### *Cues to Action*

Another category labeled as cues to action is a set of variables which are a part of the HBM and are believed to indirectly influence health behaviours. Cues to action act as a cue or a trigger to spur a person into action. Both internal cues such as perceptions of symptoms and external cues such as interpersonal communications with social networks or influences of media communications can all encourage a person to undertake a particular behaviour. In the following paragraphs the cues to action variable of social network is discussed.

### *Social Network*

The actions people take to deal with symptoms may be influenced by the availability of support from others. The literature indicates conflicting results in regards to the impact of social networks on health behaviours. Some suggest that those persons with family members (includes immediate family and relatives), friends or neighbors with whom they have regular contact may in fact influence whether self-determined avenues of treatment or traditional medical advice is sought (Kart & Engler, 1995; Rubinstein, Lubben & Mintzer, 1994). In a cross-sectional study of 465 Danish persons over the age of 45, Dean (1992) found that satisfaction with one's social support network indirectly influenced medical care seeking irrespective of age, measures of health and

health beliefs. Persons with “insufficient or non-supportive social relationships” more often consulted physicians for non-medical concerns (Dean, 1986, p. 70). It is interesting to note that while gender differences in satisfaction with social support existed (namely that women reported more unsatisfactory social supports) when the associations for age and professional contact were analyzed, the results were similar between the genders (men, gamma ( $\gamma$ ) = 0.15,  $\rho$  = 0.191; women, gamma ( $\gamma$ ) = 0.15,  $\rho$  = 0.097) (Dean, 1992, p. 44, 49).

The type of support provided by the social support network may influence health behaviors. The older adult’s social network may provide them with information about alternative health behaviors or may facilitate medical consultation (Lubben, 1988). In a study of 78 community dwelling older adults with arthritis in Winnipeg, Strain (1990) found that lay consultation with family and friends was common. Of the respondents who had a spouse, 84% turned to this individual for advice. 50% of the respondents spoke with their children, 28% spoke with siblings and 35% consulted friends who were “fellow sufferers”. Strain (1990) also found that those who were married tended to consult family only, whereas unmarried individuals consulted both family and friends. The relationship for this association was only moderate with a gamma of 0.47.

Interestingly, Lenz (1984) in her review of information seeking literature identified that relatives and friends who are considered by respondents to be “close” are more frequently consulted and are consulted prior to health professional consultation. It is suggested that this may occur because laypersons are easier to access (Lenz, 1984). Gender differences are also noted with respect to information seeking behaviors.

“Women are generally considered to engage in more extensive health search” (Lenz, 1984, p. 67).

Siblings also appear in the literature to function in the unique role of being a potential source of support in the lives of older adults especially for those with no spouse and/or no children (Connidis, 1994). Connidis (1994) found in her sample of 678 older Canadians (age 55 years or older) that siblings, particularly sisters, were regularly identified as a potential helper in times of crisis for those who had two or more siblings and were single or widowed.

### ***Summary***

In this chapter a review of the literature as it applies to the history of the HBM was undertaken. The dimensions of the HBM and their use in explaining health behaviours was reviewed. In the second section a discussion of the dimensions of the HBM and variables to be investigated in this thesis study were outlined.

## **Chapter Four**

### **Research Methodology**

The following chapter outlines the methodology that was used in this study. Both qualitative and quantitative methods were utilized. An explanation of the sample recruitment design and data collection is provided as well as ethical considerations. Background information regarding the measurement tools is included. The data analysis plan is also discussed.

#### ***Sample Recruitment***

A convenience sample of 80 English speaking, community dwelling adults, 65 years of age and older, living in the city of Winnipeg, Manitoba, Canada was obtained. Study respondents did not include past or present patients known to the investigator through her professional role. Respondents resided in private homes, apartment buildings and seniors housing complexes. The sample included a range of ages and both genders. Attempts were made to recruit respondents from geographical areas known to have a different socio-economic status. To determine which areas of Winnipeg were socioeconomically different, the researcher utilized the Manitoba Centre for Health Policy and Evaluation's (MCHPE) SocioEconomic Factor Index (SEFI) listing (Frohlich, Fransoo & Roos, 2001). This listing was developed by the MCHPE and identifies a standardized SEFI value for neighborhood clusters within Winnipeg. As such the researcher was able to identify community areas with different socio-economic status.

Using the Winnipeg Seniors Housing Directory (Age & Opportunity, n.d.) 22 housing complexes were identified in these areas. The researcher then contacted building managers to receive permission to display the study's recruitment poster (Appendix A). Additional recruitment was accomplished through the use of short presentations given at

4 different locations by the investigator. One presentation was given at a senior's meeting not associated with any particular building while the other three were undertaken in three different buildings where the recruitment poster was displayed. As well, the Winnipeg Regional Health Authority's Seniors Health Resource Team (SHRT) recruited potential respondents, as did a pastoral team from the Fort Garry Mennonite Brethren Church (FGMB) located in Winnipeg. These two avenues of recruitment were utilized for the purpose of including older adults who lived in their own homes. Additionally several study respondents also participated in recruitment by contacting persons they felt might be willing to participate. This snowball sampling technique was informal and initiated by the respondents themselves.

The various recruitment avenues produced different results. All 33 "snowball recruits" participated in the study with no refusals. Of those individuals who responded to posters, seven were either rejected by the investigator as they did not meet study criteria or on further discussion the seniors decided they were not interested in participation. Of those suggested by the pastoral team one was determined not to be appropriate. Of those who indicated to the SHRT they would be willing to participate five were either inappropriate or decided they were not interested in participating (Table 1). Reasons why some potential respondents were determined inappropriate included: respondents indicated their concern was diarrhoea not constipation; their interest was in topics not related to the focus of the study (ie. mood concerns; eating concerns; skin concerns); they did not meet age criteria. Several respondents who initially indicated their interest did not return the investigator's phone messages regarding establishing a meeting time. So as not to be perceived as "harassing" the potential respondents, the investigator determined that

a maximum of two attempts to establish a meeting time would be allowed. If the potential respondent(s) did not contact the researcher after this many messages then he/she was determined to be a refusal/rejection.

Table 1  
Recruitment Results

Source of Recruitment	# Potential Respondents	# Refusals/ Rejections	# Actual Respondents
Pastoral team	4	1	3
Poster	26	7	19
Presentation	18	1	17
SHRT	13	5	8
Snowball recruits	33	0	33
Total	94	14	80

### *Ethical Considerations*

Any study involving human respondents must ensure that the rights of the respondents are protected. Ethical approval for both the pilot project and the thesis study was obtained from the Education/Nursing Research Ethics Board at the University of Manitoba (Appendices B). Access approval was also received from the FGMB pastoral team and the WRHA (Appendix C).

The ethical matters of informed consent, confidentiality and protection of research respondents were attended to. A standard script (Appendix D) prepared by the investigator was provided to the SHRT and pastoral team members to inform potential respondents of the study and obtain their consent to release their name and phone number to the investigator. Potential respondents who replied to poster recruitment efforts themselves contacted the investigator by phone. Presentation attendees were provided an opportunity at the close of the presentation to indicate their interest in participating in the study. Presentation attendees indicated their consent to be contacted by the investigator in

person or by leaving their name and phone number so the investigator could contact them individually.

On first contact all potential respondents were provided verbal information regarding the nature of the study and any questions they had were answered. Informed verbal consent to participate was obtained during the first contact. A date, time and location convenient for the respondent was arranged for the face-to-face interview meeting. At the meeting the investigator provided respondents, both verbally and in writing, information concerning participation in the study (Appendix E). Respondents were informed that their participation was completely voluntary and that they could refuse to answer any questions or stop the interview process at any time if they so desired. Respondents were informed that results of the study would be made available following its completion if they so desired. Respondents were also informed that any publications or presentations resulting from the study would protect their anonymity as all data would be grouped so no one individual could be identified. This information was also repeated in the content of the consent form (Appendix F) which respondents were requested to read, date and sign. All consent forms were retained by the investigator. Respondents were asked if they had any questions and answers/clarifications were provided prior to commencing the questionnaire.

The confidentiality of all subjects and their respective data was maintained throughout the study. Adherence to the requirements of the Personal Health Information Act (PHIA) were maintained. An identification number was assigned to each respondent and was used to identify the data collection forms so as to maintain confidentiality. The

investigator was the only person completing the forms and access to the completed data was limited to the investigator, the thesis advisor and the statistical consultant.

Lastly, any investigator must ensure that every effort is made to protect respondents from any mental, physical or emotional harm associated with a research study. The questionnaire to be used in this study was designed to be completed within a one to one and a half hour interview. Respondents were provided with cue cards with questions and response options printed in large bold type so as to aid in comprehension and ease of response to instruments and questions. Potential risks of participating in this research study were considered minimal. Discussion regarding problems or concerns, which arose during the interview, took place after the completion of the questionnaire as required. There were actually very few issues raised during the interviews. Several respondents indicated that they did not particularly enjoy drinking water and questioned if coffee &/or tea were acceptable forms of hydration. Instruction as to the diuretic effects of the caffeine in both drinks and the potential effect this could have on the bowels was reviewed with respondents. Encouragement was given to each respondent to set a goal of initially incorporating at least 2 glasses of water a day into their daily routine and building up from there to 8 glasses per day. Additionally respondents were encouraged to add a few millilitres of lemon or lime juice to each glass of water as a means of improving palatability. Several respondents questioned the researcher about suggestions for improvements to their bowel regimens. Each respondent was given a copy of 3 different bowel care "recipes" (see Appendix G), which the literature identified as effective in the management of constipation and maintenance of bowel regularity.



Potential benefits of the study for those who directly participated were considered minimal. It was expected that the results of this exploratory study would add to the body of knowledge utilized by health care providers with whom the respondents might have contact.

### *Pilot Study*

A pilot project was undertaken to test the interview questionnaire. A convenience sample of 5 community dwelling adults, aged 65 years or more and known to the investigator, was used. Pilot study participants did not include past or present patients known to the investigator through her professional role. All participants stated the questionnaire was understandable, easy to complete and of acceptable length. Consequently no changes to the order, wording or format were required and the questionnaire was used unchanged in the actual study.

Ethical considerations as previously outlined were also applied to the pilot study. The pilot study respondents were not included in the actual study sample.

### *Data Collection*

Data was collected in face-to-face interviews conducted by the researcher. The interviews lasted an average of 58 minutes in the respondent's homes. Data was collected using a questionnaire constructed by the investigator. The questionnaire collected demographic information and utilized several standardized instruments, some instruments developed by the investigator and some open-ended questions. It was necessary to utilize a structured interview in order to maintain flow, sequencing and time obligations. These are important elements to the skill of interviewing which are stressed in the literature (Streubert & Carpenter, 1999). The interview questionnaire was intentionally formatted

with these ideas in mind and began with opening questions, which were benign and non-threatening then slowly moved along at a pace, which allowed respondents to feel at ease. It was essential for respondents to feel relaxed and non-threatened, as the intimate discussion regarding bowel regularity was something many were not accustomed to. Before beginning the formal interview the researcher took time to establish a relationship with each respondent. Building rapport is essential as a respondent must feel a sense of trust before he or she will reveal information (Streubert & Carpenter, 1999). The researcher offered information about herself including professional history, why gerontology was her passion and why she was interested in the subject matter of constipation. Many respondents wished to know personal information ie. was the researcher married, did she have a family etc. This information was freely provided to the respondents and in turn the researcher asked similar questions of the respondents. Finding a way to convey as sense of interest and concern for the individuality of the respondent was essential and each interview took on it's own flow in this regard. This allowed for the respondent relax and allowed the researcher to establish rapport. As the researcher moved along through the various sections of the interview protocol each new section was prefaced with a brief outline as to what kind of questions were about to be asked so that the element of surprise was removed. The data collection protocol was well tolerated and did not appear to be burdensome. All responses to questions were recorded verbatim by the investigator directly onto a paper copy of the study questionnaire (Appendix H).

### ***Conceptual Definitions***

In the literature conceptualization refers to the “process of developing and refining abstract ideas “ (Polit & Hungler, 1999, p. 24). It is important for the concepts involved in a research study to be identified, labeled and defined in order for the research process and findings to be clearly understood and conveyed to readers. In this section each concept namely, self-care health behavior, prevention and treatment methods and laxatives, are defined. Similarly the variables utilized to further operationalize each concept in this thesis study are defined. The variables discussed include: physician recommended or prescribed methods; non-physician recommended methods; lifestyle behaviors; bowel function agents; combination methods; duration of method use; frequency of method use; perceived susceptibility/likelihood of experiencing constipation; perceived severity of constipation; gender; age; marital status; education; income, socioeconomic factor index (SEFI); area; self-rated health status; health locus of control; medical skepticism; functional health; overall health status and social networks.

#### ***Self-care Health Behavior***

Self-care health behavior is defined as “the range of activities individuals undertake to enhance health, prevent disease, evaluate symptoms and restore health. These activities are undertaken by lay people on their own behalf, either separately or in participation with professionals. Self-care includes decisions to do nothing, self-determined actions to promote health or treat illness, and decisions to seek advice in lay, professional and alternative care networks, as well as evaluation of and decisions regarding action based on that advice” (Dean, 1986, p. 62).

### ***Prevention and Treatment Methods***

It was difficult to determine from the literature the difference between methods for treatment of constipation and methods for prevention of constipation. Based on the interpretation of the literature and clinical practice, non-pharmacological health behaviors did not appear to be different for prevention of constipation when compared to treatment of constipation. With respect to pharmacological methods differentiation was little better. The only clear distinction was that non-pharmacological methods are routinely presented as the preferred health behaviors. As the literature had not clearly differentiated between prevention and treatment methods this study did not differentiate between the two.

### ***Laxative: a definition***

The use of the term laxative in the literature was noted to be inconsistent. In some cases it appeared to be referring to pharmaceutical products which were used to cause evacuation of the bowel. At other times it seemed to be referring to any substance which caused a laxation effect. In fact when the definition was researched in the lay and medical dictionaries the definition were similar yet different. In the Merriam Webster Dictionary (1997) laxative is defined as both a noun and an adjective. As an adjective laxative is defined as "relieving constipation" (p. 422). As a noun, laxative is defined as "a usually mild laxative drug" (p. 422). In Mosby's Medical and Nursing Dictionary (1986) laxative is defined as "1.) of, or pertaining to a substance that causes evacuation of the bowel by a mild action. 2.) a laxative agent that promotes bowel evacuation by increasing the bulk of the feces, by softening the stool, or by lubricating the intestinal wall." (p. 639).

Consequently it was unclear as to whether laxative should include anything which causes evacuation of the bowels or if it should be limited to pharmaceutical products. For clarity

of purpose, the term laxative was defined in this study as a pharmaceutical product which is produced expressly for the purposes of bowel evacuation. A laxative can be used orally or inserted into bodily orifices for the stimulation of bowel evacuation.

### ***Operational Definitions***

#### ***Physician recommended or prescribed methods***

The physician recommended or prescribed methods included any prescription medication, over-the-counter medication, dietary methods or other treatment(s) which the respondent used and which his or her physician either prescribed or recommended.

#### ***Non-Physician recommended methods***

The non-physician recommended methods included any method or treatment which was not recommended or prescribed by the respondent's physician and was used by the respondent. Recommendations for the use of these methods could come from a variety of sources including media communications (eg. television, written material in newspapers or magazines, radio), friends, family, alternative health care providers, nurses, pharmacists etc. As well these methods may have been something which the respondent had determined on their own through "trial and error". These included such things as home remedies which may have involved dietary components (eg. mixtures of various edible products prepared by or for the respondent); over-the-counter medication(s); dietary methods which included edible or drinkable products commercially prepared which the respondent did not alter in any way (eg. prune juice and/or bran cereal consumed in original form); or alternative/complementary methods (eg. herbs, abdominal massage, biofeedback) etc.

### ***Lifestyle Behaviors***

Lifestyle behaviors included behaviors such as dietary practices (eg. bran, fruits, fluid intake), exercise and alternative therapies which did not involve ingesting products such as aromatherapy, biofeedback, chiropractic and massage therapy.

### ***Bowel Function Agents***

Bowel function agents included methods which involved ingestion of products such as herbs, mega-vitamins, roots, extracts, laxatives as well as pharmaceutical agents which are inserted into bodily orifices (eg. enemas or suppositories etc.).

### ***Combination Methods***

Combination methods included the simultaneous use of both bowel function agent(s) and lifestyle behaviour(s).

### ***Measurement of Study Variables***

In the following section, the outcome and independent variables utilized in the study project are discussed. A visual outline of the study variables as they relate to the HBM is provided in Appendix I.

### ***Outcome Variables***

There was one original outcome variable investigated in this thesis project - physician and non-physician recommended methods. Additional analysis was conducted which included the outcome variable professional and non-professional recommended methods. The decision to include this was based upon examination of the data, which revealed that a small proportion of the sample actually utilized physician recommended methods. A considerable proportion of the sample utilized non-physician professional recommended methods and non-professional recommended methods.

***Physician recommended or prescribed vs. Non-Physician recommended Methods***

This dichotomous variable was coded as physician recommended or prescribed (01) and non-physician recommended methods (00). If the method was not recommended or prescribed by the respondent's physician a further probing question was put forth to the respondent. Respondents were asked

“Who recommended this method to you?”

The non-physician recommendation sources were coded as self (which included methods determined by “trial & error”) (00), spouse (01), family member (included parents, children, and extended relatives) (02), friend (03), registered nurse (04), pharmacist (05), occupational therapist (06), physiotherapist (07), alternative care provider (included such things as health store attendant, chiropractor, acupuncturist, herbalist, doctor of homeopathy, massage therapist, naturopath) (08), literature (09), advertising (on television, in magazines or heard about via radio) (10), other (which included such people as home care worker, teachers, activity leader) (11), no non-physician recommendation source (12) and dietician (13).

***Professional vs. Non-professional Recommended Methods***

In reviewing the data it was determined that a large proportion of the sample utilized methods which were recommended by professionals other than physicians. As such a variable identified as professional versus non-professional recommended methods was created. This dichotomous variable was coded as any professional recommended method (01) (and included those which the respondent identified as recommended by a physician, registered nurse, pharmacist, occupational therapist, physiotherapist or dietician) and non-professional recommended methods (00).

### *Descriptive Variables*

In addition to the two outcome variables, questions regarding the duration of use and frequency of method use were asked. Responses to these questions were utilized for descriptive purposes and were not used as outcome variables.

#### *Duration of Use*

In order to establish the duration of use for each method respondents were asked: "For each method I would like you to think about how long you have been using each method. Please tell me the length of time you have been using each method by choosing the response option from this card which best describes how long you have been using each method."

Response options on the cue card and the corresponding coding was:

less than 6 months (00)	6 to 10 years (03),
6 months to 1 year (01)	more than 10 years (04).
1 to 5 years (02)	

#### *Frequency of method use*

Respondents were asked to think about their behaviour over the previous month and to report how often they had utilized the previously identified methods in the month previous to the interview. The question posed was:

"Please think about your bowel regimen over the past month and choose a response option from this card which best describes how often you used these methods in the last month."

Response options were printed on a cue card and included the following options and coding:



00	Never	03	Alternate days
01	<1 times /week	04	Daily
02	1-2 times /week		

### *Qualitative Inquiry*

At the outset of this project it was indicated that two questions, specifically, “What do older adults consider normal bowel functioning?” and “How do older adults define constipation?” would guide this study. In order to explore the respondents’ understanding of constipation and normal bowel functioning the following questions were asked by the researcher.

- 1) How have your bowels been over the years?
- 2) Please tell me in your own words what you consider “normal bowel functioning” to be?
- 3) What does “regular” with respect to bowels, mean to you?
- 4) What would cause you to think your bowels were not functioning normally?
- 5) When someone says they are constipated or have problems with constipation what exactly do you think that means?
- 6) What would cause you to think you were constipated? What symptoms do you have if/when you are constipated?
- 7) Do you think constipation affects a person’s health, their social life, their life in general? Why?

These questions are based on the study by Koch and Hudson (2000) which is one of the only studies available in the literature which explored older adults' perceptions of constipation in a qualitative manner.

### *Independent Variables*

There were 15 independent variables in this study. These included: 1) perceived susceptibility/likelihood of experiencing constipation; 2) perceived severity of constipation, 3) gender, 4) age, 5) marital status, 6) education, 7) income, 8) SEFI, 9) area, 10) self-rated health status, 11) health locus of control, 12) medical skepticism, 13) functional health, 14) overall health status and 15) social networks.

Operationalization of the variables is addressed in the following paragraphs.

#### *1) Perceived Susceptibility/Likelihood of experiencing constipation*

Perceived susceptibility/likelihood of experiencing constipation was obtained by the use of a single question. This question was adapted from the question "Would you say that you are more likely than others to get sick, about as likely as others to get sick, or less likely than others to get sick?" (Harris & Guten, 1979, p. 21) used by Harris and Guten in their study concerning health protective behaviors of 842 randomly selected adults from the Cleveland Ohio area. The researchers reported that 46% of their sample was male, 25% was non-white, 33% was between the ages of 18-34 years, 35% between 35-54 years and 32% was 55 years and older. Answers to the question identified that respondents with the highest perceived vulnerability to illness performed the most activities designed to promote and protect their health. The question was scored on a Likert scale with a range of responses of "more likely than others to get sick", "about as likely as others to get sick" and "less likely than others to get sick". There were no

psychometric properties available for this question in the literature. Code variables were not identified in the article however it was reasonable to assume that numerical coding would be such that the higher the score the greater the perception of vulnerability. Higher scores indicated greater perception of susceptibility to constipation.

For this study, respondents were asked the following question:

“Would you say that you are more likely than others to become constipated, about as likely as others to become constipated or less likely than others to become constipated?”

Respondents were shown a cue card with the possible range of responses printed on it to ease reply to the question. Response choices included:

Less likely than others (00)

About as likely as others (01)

More likely than others (02)

In order for this variable to be utilized in logistic regression analysis it was converted into an indicator or “dummy” variable and recoded according to SPSS syntax format (Norusis, 1990) as done by previous researchers (Hawranik, 1997). Two new variables were created to represent the susceptibility to constipation categories. The coefficients for the new variables represented the effect of each category of susceptibility to constipation compared to a reference category (which was comprised of respondents who indicated greatest susceptibility to constipation). The coefficient for the reference category was 00.

## ***2) Perceived Severity of Constipation***

Perceived severity of constipation was operationalized by using a modified version of a visual severity scale utilized by Weinstein (2000) in his study of the relationship between perceived probability, perceived severity and health protective behaviors. Weinstein's study sample was a convenience sample of 12 individuals aged 20 to 74 years. The participants were provided a list of life's events and hazards (eg. high blood pressure, skin cancer) and were requested to indicate their beliefs of the likelihood that they would experience them and the likelihood of that happening on a scale from 0 (no chance of occurrence) to 10 (certain to happen). The participants were also requested to indicate on a scale from 0 to 10 how severe the events would be with 0 indicating "innocuous, no harm at all" to 10 indicating "extremely devastating". Results from the study indicated that precautions against negative events are not taken when either the likelihood or severity is zero. As such the association between likelihood of occurrence and motivation to act varied with the severity and likelihood of the negative event. Unfortunately the power of the study was hampered by its sample size. In fact the authors indicated that to achieve a power of 0.8 with a 0.05 level of significance a sample size of 400 participants would be required. Despite the overall limitations of the study and the fact that there were no psychometric properties provided for this scale in the literature the severity scale used in Weinstein's study was felt to be applicable for this thesis study.

For this thesis study alterations were made to the original scale. This involved changing the wording of the end points of the scale. The original wording at the zero point of the scale was "innocuous, no harm at all". For this study the descriptor

“innocuous” was removed. The wording at the ten point of the scale was originally “extremely devastating”. This was changed to “most extreme harm” for this study.

Severity										
0	1	2	3	4	5	6	7	8	9	10
no harm at all										extreme harm

Respondents were shown the scale on a cue card and were requested to choose a number on the scale which most accurately represented how severe the harm would be if they became constipated. Scores were recorded as the actual number that the respondents indicated. Higher scores indicated greater severity. For the logistic regression models this variable remained continuous.

### ***Demographic Variables***

Demographic variables of gender, age, marital status, education and income were formulated.

#### ***3) Gender***

Gender was dichotomously coded as male (00), female (01). For the logistic regression the coding remained unchanged.

#### ***4) Age***

Age was coded as the actual age of the respondent and remained a continuous variable for logistic regression purposes. For descriptive purposes it was categorized as 65-70; 71-74; 75-80; 81-84; 85-90.

### **5) Marital Status**

Marital status was coded as:

Single/never married (00)

Widowed (03)

Divorced/Separated (01)

Other (eg. common-law) (04)

Married (02)

For logistic regression purposes marital status was collapsed into a dichotomous variable. The 'not married' category (coded as 00) included those who were single/never married, divorced/separated and widowed. The 'married' category included those who identified themselves as married. It was coded (01).

### **6) Education**

To measure education, respondents were asked questions which were used in the screening interviews of elders in the follow-up to the Manitoba Study of Health and Aging (MSHA-2) (MSHA-2 Research Group, 1998). Respondents were asked:

“How many years of education did you complete?”

The number of years identified by the respondent were coded as the actual number and this was kept as a continuous variable for logistic regression purposes. For descriptive purposes years of education were re-categorized as 5-8 years; 9-12 years;  $\geq 13$  years.

As in the MSHA-2 (MSHA-2 research Group, 1998) a further probing question was used to further clarify the education the respondent received. The question posed was:

“So that means you...(completed primary school, completed part of high school, all of high school, some university?).

As done in the MSHA- 2 (MSHA-2 research Group, 1998) the following response categories and coding were used:

no formal schooling (00)

some primary school (01)

finished primary school (02)

some secondary or high school (03)

completed secondary or high school (04)

some community or technical college or nursing program (05)

completed community or technical college or nursing program (06)

some university (07)

Bachelor's degree (08)

Master's degree (09)

PhD (10)

Other (which included such things as double degrees) (11)

Refused (77)

Don't know (DK) (88)

No response /missing (NR)(99)

This education classification was used for descriptive purposes only.

### **7) Income**

In regards to income level, respondents were requested to look at a range of income categories printed on a cue card and indicate which one best depicted their income level. Response options with their corresponding coding included:

Less than or equal to \$9,999 (00)	\$ 31,000 - \$40,999 (03)
\$ 10,000 - \$ 20,999 (01)	\$41,000 - \$50,999 (04)
\$21,000 - \$30,999 (02)	More than or equal to \$60,000 (05)

All respondents who refused to answer were coded as (77). If they indicated "Don't know" (DK) this response was coded as (88) and if respondents simply did not reply at all "No response" (NR) was coded as (99).

Although income is usually one of the standard indicators of socio-economic status it can be a difficult item to collect in a survey format as people may be reluctant to offer this information. As well it is a single item which may not accurately take into account the broader scope of factors influencing socio-economic status. In order to more accurately capture the socio-economic status of respondents the researcher needed to follow a series of steps utilizing a number of tools and resources. The information and tools required included postal codes of all respondents; the Postal Code Conversion File (PCCF) and a listing of standardized socio-economic factor index (SEFI) values. The following section describes the history of these tools and how they were utilized to construct the SEFI variable and the area variable.

### ***Background of Winnipeg Areas***

In the late 1970's the City of Winnipeg's Area Characterization program categorized geographical areas of the city into distinct neighborhoods. Since that time there has been "a convergence of agreement among various agencies that neighborhoods provide an ideal standardized measure for data collection"

([http://umanitoba.ca/academic/centres/mchp/concept/dict/wpg\\_area/wpg\\_area.html](http://umanitoba.ca/academic/centres/mchp/concept/dict/wpg_area/wpg_area.html),

Retrieved October 27, 2001). Since then the Community Data Network in collaboration



with the Winnipeg Regional Health Authority, Manitoba Health and the Social Planning Council of Winnipeg developed two levels of areas in the city of Winnipeg, namely, 12 community areas and 25 Neighborhood Clusters. (See Appendices J & K for maps of Community Areas & Neighborhood Clusters respectively). These areas were assigned on the basis of postal codes using the Postal Code Conversion File (PCCF Documentation, 2000).

### ***Background of PCCF, SEFI and SEFI Variable***

The Community Data Network and the Manitoba Health Epidemiology Unit produced the PCCF “using population weights from both the historical Manitoba Health Client Registry and the 1999 Postal Code Conversion file provided by Statistics Canada” (PCCF Documentation File, 2000). The “PCCF contains all the six digit postal codes in Manitoba and identifies what regional health authority they fall into and in the case of Winnipeg, what community areas, neighborhood cluster or neighborhood they fall into” (S. Nowicki, personal communication, November 30, 2001) The PCCF was obtained by the researcher from the Winnipeg Regional Health Authority (see Appendix L for use agreement). Using the PCCF allowed the conversion of the respondents’ 6 digit postal codes (which were collected by the researcher from the respondents at the beginning of the interview) into geographic locations.

Once the geographic locations of the respondents were identified based on their postal code a SEFI value corresponding to the respondent’s community area was determined using the SEFI value listing (Appendix M). The SEFI listing was obtained from the Manitoba Centre for Health Policy and Evaluation (MCHPE). The SEFI is a “composite measure developed at the MCHPE using a factor analysis of information

taken from the 1996 Canadian Census” (R. Fransoo, personal communication, November 30, 2001). Using factor analysis, education levels, unemployment rates and family characteristics obtained from the 1996 Canadian Census were combined to create a standardized SEFI value for neighborhood clusters within Winnipeg (Frolich, Fransoo & Roos, 2001). Community areas having the lowest SEFI scores (eg. -0.76, -0.62 as compared to 1.41 or 1.06) have a better socio-economic status.

A limitation of the SEFI is that the measure does not differentiate the income of individuals. It is quite possible that a geographical area may be deemed to have a poor SEFI however individual differences are not considered. For example, a household with high income may in fact live in a low income SEFI thus using the SEFI will immediately underestimate the actual socio-economic status of the particular household.

### **8) SEFI**

By using the PCCF and the SEFI listing each respondent was assigned an SEFI value which was entered into the data set as the actual number. A negative SEFI score indicated a better SEFI.

### **9) Area**

In order to effectively manage the SEFI values, the researcher created a categorical “area” variable. The area variable consisted of 3 categories. The first area category designated was the “average area”. It included neighborhood areas with SEFI values ranging from - 0.50 to 0.50. This range of values was chosen based on the knowledge that the province of Manitoba’s SEFI average was 0.0 and Winnipeg’s SEFI average was 0.02 (Frolich et. al., 2001). This “average area” category was coded as (01). A category above this called “better than average area” (SEFI’s  $\leq -0.51$ ) was created and

coded as (02) and a third called "worse than average area" (SEFI's  $\geq 0.51$ ) was created and coded as (00). Respondents were thus assigned an area variable code of 0,1 or 2 based on their SEFI. The area variable was eventually dichotomized into "average area"(recoded 00) and "better than average area"(recoded 01) and the "worse than average area" was deleted, as there was only one respondent in that category.

### *Sociopsychological Variables*

#### *10) Self-rated Health*

A tool commonly called the "global self-rated health question" is identified in the literature as a valid and reliable measure of health status for use with the elderly which is stable over time, correlates with physician ratings of health and utilization of health care services and is predictive of mortality (Chipperfield, 1993; Idler & Benyamini, 1997, Idler & Kasl, 1991; Maddox & Douglass, 1973; Mossey & Shapiro, 1982; Rakowski, Mor & Hiris, 1991, 1994; Strain, 1993). A U.S. study, the 1984-1990 Longitudinal Study of Aging which used persons over the age of 70 (Rakowski, Mor & Hiris, 1994) used the wording "Would you say your health in general is excellent, very good, good, fair, or poor?". Alternate wording such as "For your age, in general, would you say your health is: excellent, good, fair, poor, bad?" as in the 1971-1977 Manitoba Longitudinal Study on Aging by Mossey and Shapiro (1982) has also been used. In their review Idler and Benyamini (1997) indicate that the concept of self-rated health is "relatively insensitive to the semantic variations in the questions eliciting it" (p. 22).

The version which this thesis study employed was the one utilized by Mossey and Shapiro (1982). Respondents were shown a cue card with the following question and response options printed on it:

“For your age, in general, would you say your health is:

Bad, Poor, Fair, Good or Excellent?”

Responses were coded as poor/bad (00), fair (01), good (02) and excellent (03). There is an argument put forth in the literature that the measure of self-rated health cannot assume that the “difference between any two contiguous response categories is of equal importance” (Wolinsky & Arnold, 1988, p. 89). As such the difference between excellent versus good versus fair versus poor health cannot be adequately captured. Consequently the measure of perceived health status is better able to capture the distinction between categories if dichotomized as excellent or good versus fair or poor (Wolinsky & Arnold, 1988). As demonstrated by previous research (Hamel, 2000; Mossey & Shapiro, 1982; Wolinsky & Arnold, 1988) the resulting categories representing the self rated health responses were dichotomized into poor (which included those who answered poor or fair) (coded as 00) and, good (which included those who answered good or excellent) (coded as 01).

### ***11) Health Locus of Control***

Health locus of control was measured using the Multidimensional Health Locus of Control Scales (MHLOC) developed by Wallston, Wallston & DeVellis (1978). These three scales were developed to measure three dimensions believed to contribute to health behaviors, namely internality (internal health locus of control scale, IHLC), powerful others (powerful others health locus of control scale, PHLC) and chance or externality (chance health locus of control scale, CHLC)(Wallston et al., 1978). The scales have been used in a wide variety of studies including studies with children, adults and older adults and are written at an eighth grade reading level (Bundek, Marks & Richardson,

1993; Kist-Kline & Cross Lipnickey, 1989; McDougall, 1982; Wallston et al., 1978). Wallston and colleagues suggested that the scales could be used separately or in combination depending upon the purpose of the research, the population being studied and the time available (1978).

Each scale has two forms and can be used separately or in combination depending upon the constraints of the population and time. Each scale form consists of items scored on a six point Likert scale ranging from strongly disagree = 1, disagree = 2, slightly disagree = 3, slightly agree = 4, agree = 5 and strongly agree = 6. The internal consistencies for the MHLOC scales have been determined by Wallston and colleagues (1978). Form A of IHLC has an alpha of 0.76 and Form B of IHLC has an alpha of 0.71. Jointly forms A&B of the IHLC have an alpha of 0.85. Form A of PHLC has an alpha of 0.67 and Form B of PHLC has an alpha of 0.71. Together Forms A&B of PHLC have an alpha of 0.83. Similarly, Form A of CHLC has an alpha of 0.75 and Form B has an alpha of 0.69. Together Forms A&B of CHLC have an alpha of 0.84 (Wallston et al, 1978).

For this research study Form A of all three measures of the MHLOC scales (Appendix N) was used. There were several factors which influenced the researcher to utilize Form A. On review of the two forms the greatest difference noted was in the wording. The researcher preferred the wording used in Form A. Additionally, the alpha coefficients for each form were considered and Form A was felt to be superior. As well by choosing not to use the combined version of Forms A & B repetition and excessive time demands were eliminated.

The Cronbach's coefficient alpha for the Internal Health Locus of Control scale in this study was .77. This is slightly greater than the alpha of 0.76 reported by the creators

of the scale, namely Walston, Walston and DeVellis (1978). The Cronbach's coefficient alpha for the Powerful Others Health Locus of Control scale in this study was 0.65. This is slightly less than the alpha of 0.67 reported by Walston, Walston and DeVellis (1978). For the third scale, the Chance Health Locus of Control scale, the coefficient alpha was 0.61. This is lower than the coefficient alpha reported by Walston, Walston and DeVellis (1978) of 0.75.

As done in previous research each scale was separately summed so as to provide three individual scores (McDougall, 1982; Wallston et. al, 1978). The higher the score the more internally or externally controlled the health beliefs of the respondent were. Scores remained continuous for logistic regression purposes.

### ***12) Medical Skepticism***

Medical skepticism was measured in the manner outlined in Segall's 1987 study of older Manitoban adults' health care beliefs and health practices. In this cross-sectional study of 542 randomly selected residents of Winnipeg, medical skepticism was measured by the respondents' attitudes toward physicians. A series of six statements was presented to respondents and they were asked to indicate their level of agreement with the Likert-type attitudinal statements. The attitudinal statements ranged from "strongly disagree" to "strongly agree". Varimax rotation factor analysis done by Segall (1987) found that two dimensions of medical skepticism were identified by the questions. These included skepticism about things that doctors say (eigenvalue of 1.92) and skepticism about the things that doctors do (eigenvalue of 1.09) (Segall, 1987). Segall (1987) indicates that the maximum scores on both scales was nine and the minimum scores on both scales was

three. The literature did not indicate in which direction the scoring schema ran. In reviewing the scales questions it was evident that higher scores meant greater skepticism. Skepticism about the things that doctors say and skepticism about the things that doctors do were measured in this study using the six statements as outlined by Segall (1987, p. 62). The six statements with their factor loadings as developed and determined by Segall (1987) are listed below:

- 1) "I have my doubts about some things doctors say they can do for you" (factor loading 0.58).
- 2) "Doctors often tell you there's nothing wrong with you, when you know there is" (factor loading 0.70).
- 3) "I believe in trying out different doctors to find out which one I think will give me the best care" (factor loading 0.75).
- 4) "If you wait long enough, you can get over most sicknesses without going to the doctor" (factor loading 0.77).
- 5) "Some home remedies are still better than prescribed drugs for curing sickness" (factor loading 0.70).
- 6) "A person understands his/her own state of health better than most doctors" (factor loading 0.52).

Reliability testing of the two scales in this thesis study was completed. The Cronbach's coefficient alpha for the scale measuring skepticism about the things that doctors say was 0.44. The Cronbach's coefficient alpha for the scale measuring skepticism about the things that doctors do was 0.41.

In this thesis study respondents were directed by the researcher in the following manner:

“I am going to read six different statements to you now. After each statement please indicate to me your level of agreement or disagreement with the statement.

Please choose a response from the ones listed on this card.”

Response options were printed on a cue card and were coded as follows:

Strongly disagree (01)

Disagree (02)

Neither agree nor disagree (03)

Agree (04)

Strongly agree (05).

Questions 1-3 were summed and questions 4-6 were summed as done in previous research (Segall and Goldstein, 1986). Higher sums of scores indicated greater skepticism on both scales. This variable was kept as continuous.

### ***Structural Variables***

#### ***13) Functional Health***

Questions utilized in the MSHA-2 (MSHA Research Group, 1998) (Appendix O) were utilized in this study to measure respondents' functional health. These questions were based on the original functional status questions developed by Fillenbaum (1988) in the Older Americans Resources Study Project (OARS). The OARS instrument is widely accepted as a valid and reliable tool to measure functional status. Functional health in basic activities of daily living (ADL) as well as instrumental activities of daily living (IADL) were measured. The questions cover both basic activities of daily living and



instrumental activities of daily living. The basic activities of daily living (ADL) involve 7 activities including: 1) eating, 2) dressing, 3) grooming, 4) walking, 5) getting in and out of bed, 6) bathing, and 7) toileting. The instrumental activities of daily living (IADL) involve 15 activities including: 1) getting around the house, 2) using stairs, 3) using the telephone, 4) traveling to places out of walking distance, 5) getting out of doors in any weather, 6) getting out of doors in good weather, 7) shopping, 8) preparing meals, 9) doing heavy house work, 10) doing light house work, 11) doing yard work/ gardening, 12) taking medications, 13) performing foot care, 14) handling day to day money and 15) long-term financial planning.

The range of score responses for each item in this set of functional questions was from 1 to 5 with "1" indicating the activity can be done without any help, "2" indicating the activity can be done with some help from a device only, "3" indicating the activity can be done with help of another person, "4" indicating the activity can be accomplished with some help from both a person and a device and lastly, "5" indicating the activity cannot be done. As in previous research the question regarding ability to do up buttons and the question regarding distance walked out of doors were not added into the overall totals (Hawranik, 1997; Labun, 2000).

The scores of the 7 ADL questions were summed. Theoretically the range of ADL total scores could be 7 to 35 with lower scores indicating better ADL functioning. Similarly an IADL score was computed. Theoretically the range of IADL total scores could be from 15 to 75. Again the lower the score the better the respondent's IADL functioning. A composite overall functional health score was obtained by combining the scores for ADL and IADL questions. Overall functional health scores could theoretically

range from 22 to 110 with lower scores indicating better overall functional health. Initially scores remained continuous however they were eventually recoded. As done in previous studies, the reported limitations were recoded dichotomously (Biegel, Bass, Schulz & Morycz, 1993; Hawranik, 2002; Johnson & Wolinsky, 1996; Labun, 2000; Starrett, Rogers & Walter, 1988). Without any help (score of 1) was recoded into "No Limitations" (00) and scores of 2 to 5 were (responses including with some help from a device only to being unable to do the activity) recoded as "With Limitations" (01).

Analysis of the dichotomized variables revealed that with dichotomization of IADL there were too few cases with "no limitations". There was thus a very poor variance in the distribution. For example there were only 4 subjects (5.1%) with "no limitations" compared to 74 subjects (94.9%) with "one or more limitations" in IADL's. Adequate variance was found in the ADL variable. When combined together as one variable "total limitations" the variance was again poorly distributed with 3 subjects having "no limitations" (3.8%) versus 75 (96.2%) with "one or more limitations". Therefore, to have both variables measured consistently the decision was made to keep the variables as continuous. The reasoning for this was that the greater the number of limitations the more likely the subjects are to use certain methods to maintain bowel regularity.

The reliability of the questions for this thesis study was tested. The Cronbach's coefficient alpha for the ADL questions was found to be 0.46 and the Cronbach's alpha for the IADL questions was found to be 0.80.

#### ***14) Overall Health Status***

The Chronic Conditions Index has been identified as a standard list of chronic illnesses used in gerontological research (Chappell, 1981; Strain, 1990). It was utilized as the specific listing of health conditions in this study. Respondents were asked the following question:

“Can you tell me if you have had any of the following problems within the last year or if you are still having aftereffects from having had them earlier?”

Respondents were then presented with a list of 14 specific health problems. The health problem list included: 1) heart problem, 2) stroke, 3) arthritis or rheumatism, 4) palsy, 5) eye trouble, 6) ear trouble, 7) dental problems, 8) chest problems, 9) stomach trouble, 10) kidney trouble, 11) diabetes, 12) foot trouble, 13) nerve trouble and 14) skin problems. If the respondent indicated they had the problem it was coded as (01) and if they did not have the problem it was coded as (00). Respondents were also given a chance to identify any ‘other’ problem(s) which did not fall into the previous categories. Conditions like headaches, thyroid problems and bladder or breast cancer were included in the ‘other’ category.

A measure of overall health status was created by summing the list. Respondents with fewer numbers of conditions and better health status, had a lower score. This method was previously questioned by Chappell (1981) in that “there is little reason to consider chronic ailments equivalent. Any simple, additive index based on these items would therefore seem inappropriate” (p. 100). However Chappell (1981) went on to further suggest that the index was summed in one study of elderly respondents in three Day

Hospitals in Winnipeg and was found to be highly reliable with an internal consistency reliability coefficient of 0.91. For this study the variable was kept as continuous.

### *Cues to Action*

#### *15) Social Network*

There are few valid and reliable social network scales available for use with older adults. The Lubben Social Network Scale (LSNS) (Appendix P) was created specifically for use with non-institutionalized community dwelling older adults by James Lubben (1988). This scale was used to measure the respondent's social network. It is a composite scale which records distinct levels of social interaction with relatives and friends. The scale uses a simple scoring method. An overall score is obtained from an equally weighted sum of ten items, each of which range in values from 0 to 5. The total LSNS can range from 0 to 50. The ten items of the scale have been shown to be highly intercorrelated with a Cronbach Alpha of 0.70 (Lubben, 1988). The scale has an interrater reliability of .85 (Rubinstein, Lubben & Mintzer, 1994). The Cronbach's coefficient alpha for the LSNS in this study was 0.69 which is just slightly less than the alpha reported by Lubben (1988). The variable remained continuous for the multivariate analysis.

### *Data Analysis*

The following section outlines how the data, both qualitative and quantitative, were analyzed.

#### *Qualitative Analysis*

The qualitative nature of the open-ended questions presented to the respondents allowed them to provide information regarding what they believed regularity, normal

bowel functioning and constipation meant and the effects of constipation. Review of the literature revealed little in the way of qualitative research regarding constipation management and/or prevention. A study by Koch and Hudson (2000) was the only one found and the qualitative questions used by the researcher were based on this work. Reliability in this study was enhanced in that only one person, the researcher, performed all data collection. Consequently a consistent interviewing approach was maintained. In order to capture complete information, the informal process of "member checking" was carried out during data collection. Member checking involved reading back to the respondent the responses transcribed on to the questionnaire by the researcher. If discrepancies in what they believed their responses were and what was written were found then corrections were made until the respondent indicated that the transcribed data was correct. The literature indicates that this process is most important for establishing and maintaining data credibility (Polit and Hungler, 1999; Streubert & Carpenter, 1999). Credibility in qualitative research includes activities designed to increase the likelihood that believable or trustworthy findings have been produced. Member checking is one such activity.

The nature of the qualitative inquiry is such that there is no universally standardized approach to analysis of qualitative data (Polit & Hungler, 1999). The nature of the questions posed necessarily influenced the use of a quasi-statistical style of analysis. Although quasi-statistical interpretation analysis is less subjective and interpretive than other forms of qualitative analysis it is nonetheless one of the four prototypical styles of qualitative evaluation and an accepted analysis style (Berelson, 1971; Krippendorff, 1980; Polit & Hungler, 1999; Weber, 1990).

Basic content analysis was used to examine the responses to the open-ended questions asked during the interview. The responses to each of the seven questions were transcribed to a master response sheet so that all responses to the same question were together thus facilitating analysis. Each of the seven questions was analyzed independently. Firstly the responses were read through so as to provide an overview of the range of responses. A second reading then occurred so that themes, phrases, words and categories found to be similar between the respondents could be identified. Words and ideas noted to be utilized frequently were then counted and simple frequency tabulations were carried out. As such frequency statements about categories and themes were able to be made. Commonalities and variations were noted among and between respondents. The themes and categorizations are presented in Chapter Five.

### *Quantitative Analysis*

Quantitative data was analyzed using the Statistical Program for the Social Sciences (SPSS for Windows) version 10.0. Data analysis included screening of the data for skewness, kurtosis, data errors, missing values and outliers. To determine whether each variable was normally distributed, histograms and skewness coefficients were examined. Normality was rejected if the ratio of the skewness coefficient to its standard error was less than  $-2$  or greater than  $+2$  (SPSS, 1999).

Univariate analysis included generating frequency distributions with measures of central tendency and variability for all of the variables. Correlation testing, using Pearson's  $r$  (product-moment correlation coefficient) ( $r$ ) and Spearman's Rho ( $\rho$ ) were used to examine the strength of association between variables. For all statistical analysis, a significance level of  $p \leq 0.05$  was used.

### *Results of Testing for Multicollinearity*

Prior to conducting multivariate analysis to further examine the factors associated with the use of MD recommended methods versus non-MD recommended methods to treat or prevent constipation, Pearson Product Moment and Spearman's Rho Correlation Matrix tests were completed. Collinearity between the independent variables was thus assessed. Correlation coefficients of 0.80 or larger were considered indicative of collinearity (Lewis-Beck, 1980; Menard, 1995). Collinearity between ADL limitations, IADL limitations and total number of limitations variables was found. This was expected as the total number of limitations variable was in fact the sum of the ADL and IADL variables. No other strong correlations were found between the other independent variables. (A combined Pearson Product Moment Correlation and Spearman's Rho Correlation Matrix is included in Appendix Q). (The identical procedure was carried out when investigating the factors associated with the use of Professional recommended methods to prevent constipation and maintain normal bowel function and non-professional recommended methods. A combined Pearson Product Moment Correlation and Spearman's Rho Correlation Matrix found in Appendix R reveals similar findings as with ADL, IADL and total number of limitations). Consequently for logistic regression purposes, the total number of ADL and IADL limitations variable was used. This is a solution to the problem of collinearity supported in the literature (Lewis-Beck, 1980; Tabachnick & Fidell, 1989).

Bivariate analysis facilitated comparisons between those older adults who utilized physician recommended or prescribed methods and those who used non-physician recommended methods. Cross tabulations with Chi-square ( $\chi^2$ ) analysis was used for

categorical variables, t-tests (t) for normally distributed variables and Mann Whitney U-tests (U) for variables with non-normal distribution. A second set of bivariate comparisons compared the characteristics of those respondents who utilized professional recommended methods versus non-professional recommended methods.

Two logistic regression models were conducted to examine the factors associated with 1) physician recommended or prescribed methods and non-physician recommended methods; and 2) professional recommended and non-professional recommended methods.

### *Limitations of the Study*

The design of the study was a cross-sectional "one-time only" snap shot view which admittedly limited the generalizability of the study findings. Cross-sectional studies do not allow for changes that occur in people's behaviors. It is possible that study respondents may learn about new ways of reducing risk and as such may change their actions. This would necessarily alter the correlations between the variables (Weinstein & Nicolich, 1993). As such the correlations revealed in this work may change if the study were to be repeated over a longer time span.

In regards to the sample selection it is true that there was not an equal chance for all older adults living in the community to participate in this study. As such the results are limited to persons who are similar to the respondents. In further regard to the sample selection, self-selection was inherently involved in this study design. Consequently biases due to this self-selection may have influenced the results further contributing to limited generalizability (Polit & Hungler, 1999). Due to the non-random method of sample selection used it must also be recognized and acknowledged that the use of inferential statistics was done so cautiously. Inferential statistics assume random selection and the



normal distribution of data. These assumptions were not upheld in this study and as such results cannot be generalized beyond the study sample.

*Summary*

This chapter provided the techniques utilized for sample recruitment, data collection, measurement as well as data analysis. Ethical considerations and limitations of the study were also discussed.

## **Chapter Five Study Findings**

The following chapter presents the study findings and results of the data analysis as previously described. Overall sample characteristics opens the chapter followed by a description of the types of methods used, the duration and frequency of use as well as recommendation sources utilized. Thematic analysis of the qualitative data is then discussed. Each question is presented independently. Univariate findings follow and are presented according to HBM conceptual groupings. This includes: demographic characteristics; structural factors; sociopsychological factors; cue to action factor and perception factors of the sample. Following this, bivariate comparisons of the characteristics of respondents who used MD recommended methods and those who did not are discussed. Similarly, characteristics of respondents who used Professional recommended methods and those who used Non-Professional recommended methods are discussed. Multivariable findings conclude the chapter. In each section the corresponding research question, which originally guided the study, is addressed.

### ***Sample Characteristics***

The average time to complete the interview was 58 minutes with a range of 27 - 110 minutes. Thirty percent of the original sample (n=80) resided in single-family dwellings. The majority of the sample, 70%, lived in apartments or condos. It must be noted that the original sample consisted of 80 respondents however 2 of these were deleted from the final sample as one respondent did not use any methods to prevent constipation or maintain bowel function and the other respondent only used one bowel function method. The remainder of the sample all used either lifestyle methods alone or in combination with bowel function agents. As such the two respondents were

determined to skew the data and were thus not included in quantitative or qualitative analyses. Consequently the final sample used in this study consisted of 78 respondents.

### *Types of Methods used by the Sample*

There were two categories of methods used by respondents in this study, namely, lifestyle methods and bowel function agents. Lifestyle methods included dietary practices, exercise and alternative therapies such as reflexology and massage therapy. Bowel function agents included the use of herbal products, vitamin products, and traditional pharmaceutical products like laxatives, enemas and suppositories. The majority of respondents, 55.1% (43 respondents) used at least 1 lifestyle method. Thirty-five respondents (44.9%) used at least one bowel function agent in combination with at least 1 lifestyle agent. There were a total of 52 bowel function agents identified and 428 lifestyle methods mentioned in total.

Table 2  
Types of Methods Used

<u>Category of Method</u>	<u>Definition</u>	<u>Absolute frequency</u>	<u>Relative frequency</u>
Lifestyle methods alone	Dietary methods, exercise, alternative methods	43	55.1%
Bowel function agents alone	Herbal & mega vitamin products; laxatives	0	0
Combination methods	Lifestyle + bowel function agents	35	44.9%
	Total	78	100.0%

In regards to gender and use of certain methods there were 12 men who used lifestyle only and 10 men who used a combination of methods. There were 31 females who utilized only lifestyle methods and 25 who used a combination of lifestyle and bowel function agents (Table 3).

Table 3  
Types of Methods Used by Gender

<u>Gender</u>	<u>Category of Method</u>		<u>Total</u>
	<u>Lifestyle</u>	<u>Combination</u>	
Male	12 (15.4%)	10 (12.8%)	22 28.2%
Female	31 (39.7%)	25 (32.1%)	56 71.8%
Total	43	35	78

### *Consultation Practices of Respondents*

Twenty seven respondents, or 34.6% of the sample, indicated that at least one of the methods they described was recommended for use by their physician. In regards to health professional consultation only 18 respondents indicated that at least one of the methods they used was recommended by either a registered nurse (RN), pharmacist, occupational therapist (OT), a physio therapist (PT) or a registered dietician (RD). Specifically, 10 respondents indicated an RN had recommended at least one method to them and 3 respondents indicated that a pharmacist had recommended at least one method to them. The remaining 5 respondents indicated either a RD or a PT recommended at least one method to them. There were no recommendations from OT's. The frequency of consultation of any of these professionals was indeterminable from the data.

In regards to Non-Professional consultation 32 respondents indicated that at least one of the methods they used was recommended to them by a family member. Twenty seven respondents indicated that the use of at least one method was influenced by literature they had read or advertising they had seen. Lastly, the greatest percentage of respondents, 85.9% of the sample or 67 respondents, indicated that at least one of the methods they used was self-taught or self determined without any sort of consultation.

***Duration of Use*** (Table 4)

In order to establish the duration of use for each method respondents were asked "For each method I would like you to think about how long you have been using each method. Please tell me the length of time you have been using each method by choosing the response option from this card which best describes how long you have been using each method."

The number of respondents using at least one method for 10+ years was 63. Of these respondents the average number of bowel function agents used was 1.2 and the average number of lifestyle agents used was 4.4.

The number of respondents using at least 1 method for 6-10 years was 23. Of these respondents the average number of bowel function agents used was 1.5. The average number of lifestyle agents used was 2.7.

The number of respondents using at least 1 method for 1-5 years was 40. Of these respondents the average number of bowel function agents used was 1.3. The average number of lifestyle agents used was 2.9.

The number of respondents using at least 1 method for 6-12 months was 5. Of these respondents the average number of bowel function agents used was 1 and the average number of lifestyle agents used was also 1.

Lastly, the number of respondents using at least 1 method for less than 6 months was 15. Of these respondents the average number of bowel function agents used was 1.3 and the average number of lifestyle agents used was 1.6.

Table 4  
Duration of Use

<u>Length of Time/Type of Agent</u>	<u># of Respondents/ Average number of agents</u>
10+ years	63
Bowel	1.2
Lifestyle	4.4
6-10 years	23
Bowel	1.5
Lifestyle	2.7
1-5 years	40
Bowel	1.3
Lifestyle	2.9
6-12 months	5
Bowel	1
Lifestyle	1
< 6 months	15
Bowel	1.3
Lifestyle	1.6

*Frequency of method use (Table 5)*

Respondents were asked to think about their behaviour over the previous month and to report how often they had utilized the previously identified methods in the month previous to the interview. The question posed was "Please think about your bowel regimen over the past month and choose a response option from this card which best describes how often you used these methods in the last month."

The number of respondents using at least 1 method on a daily basis in the month prior to the interview was 74. Of these respondents the average number of bowel function agents used was 1.5 and the average number of lifestyle agents used was 4.1.

The number of respondents using at least 1 method on an alternate days of the week basis in the month prior to the interview was 29. Of these respondents the average number of bowel function agents used was 1.0 and the average number of lifestyle agents used was 2.0.

The number of respondents using at least 1 method once or twice a week in the month prior to the interview was 20. Of these respondents the average number of bowel function agents used was 1.0 and the average number of lifestyle agents used was 2.0.

The number of respondents using at least 1 method less than once a week in the month prior to the interview was 16. Of these respondents the average number of bowel function agents used was 1.1 and the average number of lifestyle agents used was 1.5.

Lastly, the number of respondents identifying at least 1 method which they had not used in the month prior to the interview was 17. Of these, the average number of bowel function agents identified but not used was 1.3. The average number of lifestyle methods identified but again not used was 1.6.

Table 5  
Frequency of Use in Month Previous to Interview

<u>Frequency /Type of Agent</u>	<u># of Respondents/ Average number of agents</u>
<u>Daily basis</u>	74
Bowel	1.5
Lifestyle	4.1
<u>Alternate days</u>	29
Bowel	1.0
Lifestyle	2.0
<u>Twice/week</u>	20
Bowel	1.0
Lifestyle	2.0
<u>&lt;1x/week</u>	16
Bowel	1.1
Lifestyle	1.5
<u>No use in last month</u>	17
Bowel	1.3
Lifestyle	1.6

## *Qualitative Analysis*

### *Content Analysis*

#### *Question 1 – Can you tell me how your bowels have been over the years?*

The responses to this question were grouped into three categories (Table 6). The most common category involved the theme of a predictable schedule for bowel movements over the years. Two subcategories were found. One was linked to a specific time schedule. Respondent #4 stated “No problems at all, you can set your clock by it”. Respondent # 26 indicated “Good as far as I can say. Well I go pretty well every morning usually before breakfast and then after breakfast daily”. Respondent # 42 indicated “Very regular. Especially when I’m home, after breakfast”. Respondent # 74 indicated “Great. I have no problem. I’m regular almost by the clock”.

The second subcategory was concerned with frequency of evacuation. Respondent 62 indicated, “OK, I don’t go every day. Years ago the doctor said if you go 2-3 times a week it’s OK and that’s what I do”. Respondent # 67 “Well I go every day mostly. If I don’t go every day then for sure I go the next day. Every second day. This has been lifelong”.

The second category concerned a pattern change over the years. Two subcategories were identified. This included a change for the worse and a change for the better. The first change for the worse or from predictable to unpredictable was attributed to some type of life change like pregnancy, illness, surgery or the introduction and use of medications. Respondent #3 indicated that hormonal changes attributed to a change “Changed with “change of life”-since then they have not worked as they should”. Respondent # 35 suggested that pregnancy influenced a change “...the challenge of keeping regular has



been longstanding, especially since my first pregnancy". A number of respondents indicated that medications were impacting a change. Respondent # 46 indicated "Not very good. It depends, like if I take codeine I will be stuffed up. If I don't eat fresh fruit or vegetables or tension will make it more difficult. Bowels have fluctuated. Sometimes it's 3-4 days that I don't have a bowel movement". As well Respondent 48 attributed a change to medication use "Well because of my pain I took Tylenol #3 and that causes me constipation. This is a change from last year from August where it became a noticeable problem". Similarly Respondent # 54 reinforced the change was due to medication use "Well before I had this medication it was different. I could control my bowels but now they get too hard. Since the medication there has been a noticeable change for the worse".

Table 6  
Characterization/description of how bowels have been over the years

<u>Category</u>	<u>Category definition</u>	<u>Subcategories</u>	<u>Absolute frequency</u>	<u>Relative frequency</u>
Predictable patterns	Contains words or phrases indicating predictability of bowel movements	Specific time schedule; Frequency of evacuation	37	47.44%
Pattern change over the years from predictable to unpredictable.	Contains words or phrases suggesting a noted change from one pattern to a different less desirable pattern.	Change for the worse; Change for the better	22	28.21%
Lifelong difficulty with bowel movements	Contains words indicating the predictableness of irregularity		19	24.36%
	Total		78	100.0%

In contrast to this several respondents noted that their bowel function patterns had improved over the years. Respondent # 9 indicated, "as a kid I was very constipated because I grew up in the Depression and we didn't have a proper diet but now I'm good". Similarly both Respondents # 60 and # 61 identified a positive change with age. Respondent 60 indicated "Well I used to have problems when I was younger but not so much now". Likewise Respondent # 61 indicated, "I used to be constipated as a child but now I'm not".

The third category was identified as lifelong difficulty with bowel movements. Several respondents in response to this question described the predictability of irregular and troublesome patterns. Respondents #11 and # 51 both suggested lifelong difficulties. Respondent # 11 indicated "Absolutely terrible. My mother's were and mine are. It's awful. I have to take Sennokot suppositories that's everyday". Likewise Respondent # 51 indicated "Lifelong problem since age 16. I've always had problems". Similarly Respondent # 15 indicated, "I'm always constipated. I have tried all kinds of laxatives but they just bloat me up. I've been like this ever since I can remember, even when I was a kid".

***Question 2 – Please tell me in your own words what you consider "normal bowel functioning" to be.***

The responses to this question were grouped into three categories (Table 7). The first category included responses which identified attention to frequency of bowel movements. This category was further sub-divided into 3 categories. Namely, those respondents who indicated normal bowel functioning was a daily bowel movement (a total of 45 respondents); those who believed normal bowel functioning involved having several movements per day (total of 9 respondents), and those that indicated normal

functioning was maintained if bowel movements occurred every 2 to 3 days (total of 15 respondents). The second category was concerned with the characteristics of the product of evacuation. Respondent 52 indicated that the bowel movement should be "soft" Respondent 29 indicated that the stools should not be "...too loose to too hard" while Respondent #73 and 74 both indicated that "soft and formed stool" was normal.

The third category was deemed as miscellaneous. It included physical feelings (Respondent # 2 indicated that normal bowel functioning involved "If you feel right in your stomach"); Respondent # 11 suggested that it normally took a long time for her to have a bowel movement "I have to sit for a long time". This is normal routine for her. For Respondent #7 activity level influenced normality "If you eat a lot and do a lot then you go more".

It should be noted that there were 2 respondents who indicated they did not know what constituted normal bowel functioning.

Table 7  
Characterization/description of normal bowel functioning.

<u>Category</u>	<u>Category definition</u>	<u>Subcategories</u>	<u>Absolute frequency</u>	<u>Relative frequency</u>
Frequency of Bowel Movements	Contains words or phrases indicating frequency of bowel movements	Daily bowel movement;	45	87.19%
		Several movements per day; Bowel movements every 2-3 days	9	
			<u>14</u> 68	
Characteristics of Bowel Movements	Contains words or phrases describing the product of evacuation		5	6.41%
Miscellaneous	Contained words relating to physical feelings; Time factors; Activity level		3	3.85%
Don't know			2	2.56%
		Total	78	100.0%

***Question 3 – What does “regular” (with respect to bowels) mean to you?***

The responses to this question were similar in content to the previous question. The focus for the majority of the respondents was on frequency of evacuation. There were four subcategories related to frequency (Table 8). These included once daily movements (46 respondents), two or more movements daily (7 Respondents), every other day evacuation (10 respondents) and movements every 3 or 4 days (4 respondents).

A second category similarly labelled as in question 2 as ‘Miscellaneous’ contained responses from 9 respondents which included descriptions about absence of discomfort, the lack of need for medicinal “help” to achieve a bowel movement and predictability. Respondents # 13 and 65 both identified that regularity meant “No struggling...don’t suffer any discomfort” while Respondent # 80 felt that regularity meant “If I have a normal bowel movement without help from medications or whatever. That’s what I think”. Respondents # 27, 31 and 42 were notably concerned with predictability “...the bowels are predictably regular. That you know that within an hour or two of the regular times your bowels move.”...”When it comes at a specific time every day” and “Well the same thing at the same time kind of”. It must be noted that there were two respondents who did not answer the question.

***Question 4 – What would cause you to think your bowels were not functioning “normally”?***

The responses to this fourth question were categorized into 5 areas (Table 9). The first category was concerned with a change in routine. Respondents indicated that they felt a notable change in either their dietary routine or a change in daily activity routine would indicate to them that their bowels were possibly not functioning normally.

Table 8  
Characterization/definition of regularity.

<u>Category</u>	<u>Category definition</u>	<u>Subcategories</u>	<u>Absolute frequency</u>	<u>Relative frequency</u>
Frequency of Bowel Movements	Contains words or phrases indicating frequency of bowel movements	Daily bowel movement;	46	85.97%
		Two or more movements per day;	7	
		Bowel movements every other day;	10	
		Movements every 3 or 4 days	<u>4</u>	
			67	
Miscellaneous	Contained words relating to absence of discomfort ; no need for "help" and predictability		9	11.54%
Don't know/no response			2	2.56%
		Total	78	100.0%

There were 12 respondents who indicated this. Respondent #1 stated "When my routine is different..."; Respondent # 39 indicated "...Missing my regular routine" as did Respondent # 58 "If the diet I'm on changes".

The second category of responses identified bodily sensations which would cause the respondents to think their bowels were not functioning normally. This category contained words like "bloating, cramps, no urge to go". There were 16 respondents who provided answers in this category. For example Respondent #2 indicated "Bloating; you feel like you want to move your bowels but can't". Respondent #6 indicated "Because I have no urge to go". Respondents # 15 and # 37 both indicated if there was bleeding present they would think there was something wrong with their bowel function "... If there was pain or passing blood then I would get kinda worried" and "... if there was bleeding". Respondent # 68 also identified pain as an indicator "...It's feelings of pain and discomfort. When I'm regular its not that bad".

The third category contained responses that indicated that if there was a change in the characteristics of the stool produced that this would cause the respondents to think there was a change in bowel function. Ten respondents provided responses in this category. For example Respondents # 8, 9, 24 and 45 all indicated looseness of stool would signify a change. "The looseness of the stool"; "If I got diarrhoea often without having stomach flu or something like that...."; "If you get the runs"; " I guess when I started having very loose stool I wondered if something was going on because I was used to the normal consistency". Respondent # 72 indicated that too loose a stool would signify change from normality but also included a change in colour might also indicate a change "A change in colour or it being too loose". This was in contrast to those respondents who felt that having stools, which were too hard, was an important sign that their bowel function may be in question. For example Respondent # 48 and #50 indicated, "If the stool is too hard" and "Very hard, very difficult bowel movements".

The fourth category of responses contained words that would indicate that a change in frequency of bowel evacuation would signify that the respondent's bowels were not functioning normally. Frequency of bowel evacuation was the most frequently identified indication of possible bowel malfunction. Thirty-three respondents described a change in frequency either an increase or a decrease in frequency. For example Respondents # 5, 47, 52 indicated an increase in bowel movements would indicate a change from normality whereas 11 respondents indicated a decrease in frequency would mean their bowels were not functioning normally. One respondent # 7 felt that a change in either direction, too few or too many bowel movements, would indicate a change from normality "If I go twice in one day or I don't go every second day....".

It must be noted that there were 7 respondents who chose not to provide an answer to this question.

Table 9  
Indicators of change from normal bowel function.

<u>Category</u>	<u>Category definition</u>	<u>Absolute frequency</u>	<u>Relative frequency</u>
Change in Routine	Changes in daily activities or dietary routines would signify a functional change.	12	15.39%
Bodily Sensations	Contained words relating to bodily sensations which would signify a change from normal function.	16	20.51%
Change in stool characteristics	Contained words relating to changes in stool characteristics which would signify a change from normal bowel function.	10	12.82%
Change in Frequency of evacuation	Contained words relating to changes in evacuation frequency which would signify a change from normal bowel function.	33	42.31%
Don't know/no response		7	8.97%
	Total	78	100.0%

***Question 5 – When someone says they are constipated or have problems with constipation what exactly do you think that means?***

The purpose of this question was to obtain the respondent's own meaning of the concept of constipation. There were six categories of responses among the respondents (Table 10). Several respondents provided more than one categorical response in their answer to the question and as such the total number of responses individually categorized was 94.

The first category of responses dealt with the belief that constipation meant an absence of evacuation. There were 22 responses, which indicated that no movement of the bowels meant constipation. For example Respondent #2 indicated, "...they can't move their bowels" and respondent #11 also suggested "That means you can't have a bowel movement".

The second category of responses included those who identified that constipation meant experiencing negative symptoms related to the actual act of evacuation. This included such things as hard stools, difficulty with the passage of stool, straining or not passing enough stool.

For example Respondents # 6 indicated "... Not cleaning out, not a good size bowel movement everyday" whereas Respondent #15 felt constipation meant simply "You have a hard time going...". Respondent #20 similarly indicated "well it means you sort of like you feel you have to have a bowel movement but you're straining and straining to get it out".

The third category of responses contained words that would indicate that a change in frequency or regularity of bowel evacuation defined constipation. There were 22 responses in this category. Respondent # 67 indicated, "That they're not getting regular bowel movements" whereas Respondent # 68 felt that absence of a bowel movement for 2 or 3 days would constitute constipation "You just can't go for 2 or 3 days". Respondent # 73 was a little less specific in the number of days between bowel movements however commented that "if you wouldn't have been going for at least a couple of days" this would signify constipation. Respondent # 75 was more generous in the number of days



between bowel movements, which would signify constipation stating, "I think probably 4 or 5 days without a bowel movement".

Table 10  
Definition of Constipation

<u>Category</u>	<u>Category definition</u>	<u>Absolute frequency</u>	<u>Relative frequency</u>
Absence of bowel movements	Contained words which indicated lack of bowel movement/elimination activity	22	23.4%
Experiencing negative symptoms related to the actual act of evacuation	Contained words which indicated hard stools, difficulty with the passage of stool, straining or not passing enough stool.	29	30.85%
A change in frequency or regularity of bowel evacuation		22	23.4%
A result of some type of incorrect behaviour	Contained words which indicated improper dietary or exercise activities	6	6.38%
A state wherein help of some form is required to accomplish a bowel movement.		8	8.51%
Miscellaneous-responses which did not fit into any other category		6	6.38%
Don't know/no response		1	1.06%
Total		94	100.0%

Total is 94 because some respondents provided more than one response.

The fourth category of responses included words indicating that constipation was a result of some type of incorrect behaviour. Respondent #4 indicated, "They aren't eating right". Respondent # 24 indicated a similar response "People eat certain things that don't loosen them up. Avoid chocolate and nuts because this causes constipation". Respondent # 53 also focused on dietary habits "My first concern is what do they eat. If they're going to be eating white bread and toast all the time that to me is asking for

trouble". Respondent #14 indicated, "You're not taking the right laxative. They're not doing something to keep regular". Respondent # 15 indicated "...it's cause you're not eating or exercising".

The fifth category of responses contained those whose words indicated that constipation was a state wherein help of some form was required to accomplish a bowel movement. Respondents # 30, 31 and 32 all indicated similar responses. "Unable to have a natural bowel movement", "...you cannot move the bowel without any help" and lastly "Inability to go on your own". Respondent # 45 felt that a laxative would be necessary during constipation "...they have a difficult time having a bowel movement without taking a laxative". Respondents # 59 and 65 similarly indicated reliance on a laxative was what defined constipation "To me it means you have to take a laxative or you suffer"; "Well I would think they would have to take elimination aids laxatives, that sort of thing".

The sixth category of responses contained those that were inappropriate for any previous category. There were various inclusions in this category. Respondents # 10,23 and 76 all indicated constipation meant a blockage. "The tubing isn't functioning; you're clogged up"; "Blockage"; "...It would mean there's a blockage somewhere". Respondent # 3 felt that constipation was due to hormonal imbalance "They don't have the right hormones to help them" while Respondent # 40 felt constipation was due to toxins in one's body "Well it's just not proper elimination of all the toxins in your body".

There was one respondent who chose not to answer this question.

**Question 6 – What would cause you to think you were constipated? What symptoms do you have if/when you are constipated?**

There were six categories of responses in regards to what types of symptoms are experienced with constipation (Table 11). The first category included responses which described a general discomfort like “generally unwell; generally uncomfortable”. There were 15 responses in this category.

Table 11  
Symptoms of Constipation

Category	Category definition	Absolute frequency	Relative frequency
General discomfort	Contained words which indicated general discomfort or feelings of being uncomfortable	15	12.2%
Gastrointestinal symptoms	Contained words which indicated bloating; fullness; nausea; stomach aches etc. .	56	45.5%
Energy depletion	Contained words like feeling sluggish; no energy.	8	6.5%
Negative symptoms related to evacuation experience	Contained words which indicated hard stool; difficulty passing stool; urgency but cannot go etc.	18	14.6%
A change in frequency bowel evacuation		8	6.5%
Miscellaneous-responses which did not fit into any other category	Contained words like headaches; bad breath; psychological disposition changes etc.	9	7.3%
Don't know/no response		9	7.3%
	Total	123	100.0%

Total is 123 because some respondents provided more than one response.

The second category was the most common response category. It included responses which described specific gastrointestinal symptoms like bloating, gas, nausea, fullness and stomach aches. There were 56 responses in this category.

In the third category were responses which suggested persons felt energy depletion was related to constipation. There were 8 such responses.

In the fourth category the responses indicated negative symptoms related to the actual act of elimination. This included such things as “urgency to go but you can’t; difficulty passing stool; hard stool” etc. There were 18 responses in this group.

In the fifth category were responses which indicated a decrease in frequency. There were 8 responses of this nature.

The sixth category was again a miscellaneous category. It included responses which did not fit appropriately into the previous five groupings. This category contained responses, which indicated such things as headaches, bad breath and psychological disposition changes were symptoms related to constipation. There were 9 responses of this nature.

There were 9 respondents who chose not to provide an answer to this question.

***Question 7 – Do you think constipation affects a person’s health, their social life, their life in general?***

There were a total of four categories of responses to this question (Table 12). The first category contained those respondents who indicated that “yes” constipation affected a person’s health. There were 18 in this category. There were various reasons for why they felt that constipation affected a person’s health. Respondent # 2 felt “...[because] if this continues you don’t feel right”. Respondent #3 also agreed that constipation affects a person’s health “Yes it does – it affects their health. It affects the nerves.” Similarly

Respondent # 18 suggested that the physical discomfort affects one's health and affects them psychologically "Oh absolutely. Well it creates a physical discomfort which causes the person to be on edge though they try to hide it".

The second category of responses contained those who indicated that constipation affected a person's social life. There were 21 responses in this category. Respondent # 10 indicated "Oh yes, very much so because of the symptoms. The element of worry related to passing of flatulence which would be socially unacceptable". Respondent # 39 similarly responded "Well it would be detrimental to their social life. It could be embarrassing socially especially if there is wind".

Table 12  
Areas of Life affected by Constipation

Category	Category definition	Absolute frequency	Relative frequency
Health negatively affected	Contained words which indicated constipation affected health negatively.	18	21.9%
Social life negatively affected	Contained words which indicated constipation negatively affected one's social life.	21	26.6%
Life in General negatively affected	Contained words which indicated that life in general was negatively affected by constipation.	29	35.3%
Yes constipation had negative effects	Contained words which indicated constipation had negative effects but no specifics were provided	3	3.6%
No constipation had no negative effects	Contained words which indicated constipation had no negative effects.	11	13.4%
Total		82	100%

Total is 82 because some respondents provided more than one response.

Respondent # 28 also indicated "...well if I feel uncomfortable I don't feel very sociable". Respondent # 53 also indicated "Oh yes. Oh yes. Well I know somebody who has to take medication to go and it limits her ability to go out. I can understand that, if you're not feeling good it limits your ability to take part in everything".

The third category of responses included those who felt that constipation negatively impacted on life in general. This was the most frequently identified category. There were 29 responses. Respondents # 28 and 29 both indicated that constipation affects life in general in a negative way. "If affects their life in general completely..." and "If they have it bad enough yes. Because of the way you feel. It would have to be bad enough to affect all that". Respondent # 30 also indicated "Oh I guess in general you would feel miserable". Similarly respondents # 69 and 70 both felt that it affects life in general. "In a certain degree if you're uncomfortable then certainly it affects you. If you're not regular then you don't feel good" and "Yes I would think so. If you have proper function you feel better".

The last two categories were those who either indicated that constipation negatively affected a person however did not provide a specific reason why or those who felt that constipation did not affect a person negatively. There were a total of 3 and 11 responses respectively in these categories.

### *Univariate Data Analysis*

#### *Modifying Factors of the Respondents (n=78)*

The characteristics of the respondents presented are grouped according to the Health Belief Model. These include the modifying factors of age, gender, marital status,

years of completed education, income level and area of residence and socio-economic factors. The respondent characteristics are presented as modifying factors in Table 13.

### *Age*

The respondents' ages ranged from 65-89 years, with a mean age of 76.2 years. Over half of the sample (66.7%) were between the ages of 65-79 suggesting that the greater portion of the sample were "young old" adults.

### *Gender*

There were 22 men and 56 women who participated in the study. The greater portion of the sample was female (71.8%).

### *Marital Status*

Slightly more than half (55%) of the sample was married. Eleven and a half percent (11.5%) of respondents were single/never married while 26 (33%) were either divorced/separated or widowed.

### *Years of Completed Education/Type of Education*

Respondents completed a mean of 11.6 years of schooling. The range was 5-20 years. Fifty-two point six percent (52.6%) of the sample had some high school or had completed high school while 24 respondents had some college/university or had completed university.

### *Income Level*

Income ranged from  $\leq$ \$9,999 to  $\geq$ \$60,000. Two respondents refused to report an income level. Of the 76 respondents who did report, 60.1% indicated they had yearly incomes between \$10,000-\$30,999.

Table 13  
Modifying Factors of Respondents (n=78)

<u>Respondent Characteristics</u>	<u># of respondents</u>	<u>% of sample</u>
<u>Age</u>		
65-70	16	20.5
71-74	18	20.5
75-80	27	33.3
81-84	15	17.9
85-90	<u>6</u>	<u>7.7</u>
Total	78	100.0
Mean (years)	76.23	
Range	65-89	
<u>Gender</u>		
Male	22	28.2
Female	<u>56</u>	<u>71.8</u>
Total	78	100.0
<u>Marital Status</u>		
Married	43	55.1
Not married	<u>35</u>	<u>44.9</u>
Total	78	100.0
<u>Years of Completed Education</u>		
5-8 years	13	16.7
9-12 years	41	52.5
≥13 years	<u>23</u>	<u>30.8</u>
Total	78	100.0
Mean (years)	11.55	
Range	5-20	
<u>Income Level</u>		
≤\$9,999	4	5.1
\$10,000-\$20,999	20	26.3
\$21,000-\$30,999	27	34.6
\$31,000-\$40,999	12	15.4
\$41,000-\$50,999	7	9.0
≥\$60,000	4	7.7
Refused	<u>2</u>	<u>2.6</u>
Total	78	100.0
<u>Area of Residence</u>		
Worse than average	1	1.3
Average	60	76.9
Better than average	<u>17</u>	<u>21.8</u>
Total	78	100.0

#### *Area of Residence & Socioeconomic Factor Index (SEFI)*

The majority of the sample (76.9%) resided in areas of Winnipeg which were rated as "average" while 21.8% lived in areas considered "better than average". As described elsewhere, the area rating scheme was based upon standardized SEFI ratings attributed to the particular neighborhood areas of Winnipeg. "Average" areas of the city



had SEFI ratings between -.47 to .44 while those in “better than average” areas had SEFI ratings between -.51 to -.76. Only one respondent resided in a “worse than average” area of the city.

### ***Structural Factors of the Sample (n=78)***

The structural factors of the Health Belief Model measured in this thesis study included a measure of respondents’ overall health status and their functional health status. As described previously the number and type of chronic conditions were collected as a measure of overall health status and respondents’ ADL and IADL limitations were collected as a measure of functional health (Table 14).

### ***Overall Health Status***

The number of chronic conditions of respondents ranged from 0 to 11. The average number of health conditions was 3.6. There were 4 respondents who reported no chronic health conditions. Thirty-five respondents (44.9%) reported 4 or more chronic conditions. The 4 most frequent conditions reported were arthritis (57.7%); eye troubles (47.4%); stomach (gastrointestinal) problems (37.2%) and heart problems (30.8%). Twenty-five indicated they had “other” conditions or problems not identified in the standard list. These included such things as allergies; hip and back difficulties not related to arthritis as well as breast and bladder cancer.

### ***Functional Health Status***

Respondents’ overall functional health was characterized by their limitation(s) or lack of limitation(s) in both basic ADL’s and IADL’s. Respondents ranged from having zero to 17 activities that required assistance of some form. Only 3 respondents were independent in all 22 activities.

For the 7 basic ADL's there were no respondents requiring assistance with all the activities. The range of activities requiring assistance was 0-4.

The mean number of limitations was 0.6. Forty-nine respondents (62.8% of the sample) were independent with all the activities. Nineteen respondents (24.4% the sample) required help with only one activity. The most frequently identified activity requiring assistance was taking a shower or a bath (28.2%). Of those requiring assistance with showering or bathing, the majority (20.5%) required the use of a device only. The remaining 7.7% required either help from a person or from both a person and a device.

The mean number of IADL limitations was 3.6. In comparison to basic ADL's there were only 4 respondents (5.1% of the sample) who were independent in all 15 IADL's. The range of activities requiring assistance was wider for the IADL's, namely 0-13. Only 11 respondents (14.1%) required assistance with one activity. Forty-four respondents (56.4% of the sample) required assistance with 1 to 3 activities while 13 respondents (16.8% of the sample) required assistance with 6 or more IADL's. The most frequently identified IADL activity requiring at least the assistance of another person was the larger banking responsibilities such as long term financial planning. Sixty-one respondents (78.2% of the sample) required assistance with this activity.

Table 14  
Structural Factors of Sample (n=78)

<u>Respondent</u> <u>Characteristics</u>	<u># of respondents</u>	<u>% of sample</u>
<u>Health Conditions</u>		
Mean (# of conditions)	3.59	
Median (# of conditions)	3.00	
Range	0-11	
<u>Total Limitations</u>		
0 limitations	3	3.8
1 limitation	10	12.8
2 limitations	13	16.7
3 limitations	17	21.8
4 limitations	6	7.7
5 limitations	11	14.1
6+ limitations	<u>18</u>	<u>23.1</u>
Total	78	100.0
Mean	4.20	
Median	3.00	
Range	0-17	
<u>Basic ADL Limitations</u>		
0 limitations	49	62.8
1 limitations	19	24.4
2 limitations	7	9.0
3 limitations	1	1.3
4 limitations	<u>2</u>	<u>2.6</u>
Total	78	100.0
Mean	0.56	
Median	0.10	
Range	0-4	
<u>IADL Limitations</u>		
0 limitations	4	5.1
1 limitation	11	14.1
2 limitations	12	15.4
3 limitations	21	26.9
4 limitations	7	9.0
5 limitations	10	12.8
6+ limitations	<u>13</u>	<u>16.8</u>
Total	78	100.0
Mean	3.64	
Median	3.00	
Range	0-13	

### ***Sociopsychological & Cue to Action Factors of the Sample*** (Table 15)

The sociopsychological factors of the Health Belief Model measured in this study included measures of respondents' self-rated health, their health locus of control (including internal, powerful others and chance) as well as measures of medical skepticism including skepticism about what doctor's say and skepticism about what doctor's do. The one cue to action factor was a measure of the respondents' social network. As one factor cannot be considered a block on its own for multivariate analysis, this factor was included together with the sociopsychological factors block.

#### ***Self-Rated Health***

Respondents were asked to rate their own health status. Twenty-eight respondents (35.9% of the sample) indicated their health was either poor /bad or fair. A very small percent, 2.6% (2) in fact, indicated their health was poor/bad. Less than half the sample, 33.3% (n=26), rated their health as fair while the majority of the sample, 64.1% of respondents (n=50) indicated their health was good or excellent. Distinguishing between good and excellent, 36 respondents rated their health as good while 14 rated their health as being excellent.

#### ***Health Locus of Control***

When examining the results of the Multidimensional Health Locus of Control scales, overall the sample scored higher in the Internal Health Locus of Control scale. The average score for this scale was 23.8 with a median score of 24.0. The average scores for the Powerful Others Health Locus of Control and Chance Health Locus of Control scales were 20.3 and 18.6 respectively. The median scores for these scales were 21.0 and 19.0 respectively.

***Medical Skepticism regarding what Doctor's do & say***

The medical skepticism scales which looked at the skeptical attitudes of respondents concerning what medical doctor's do and say revealed very similar mean scores. The average score on the scale concerning skepticism about what doctor's say was 8.9 with a range of scores between 4 to 13. Scores on the scale concerning skepticism concerning what doctor's do was 9.2. with a range of scores from 6 to 13.

Table 15  
Sociopsychological & Cue to Action Factors of Sample (n=78)

<u>Respondent Characteristics</u>	<u># of respondents</u>	<u>% of sample</u>
<u>Self Rated Health</u>		
Poor/bad or Fair	28	35.9
Good or Excellent	50	64.1
Total	78	100.0
<u>Health Locus of Control</u>		
<u>Internal</u>		
Mean score	23.79	
Median score	24.00	
Range	12.0-33.0	
<u>Powerful Others</u>		
Mean score	20.29	
Median score	21.00	
Range	8.00-34.00	
<u>Chance</u>		
Mean score	18.63	
Median score	19.00	
Range	8.00-30.00	
<u>Medical Skepticism</u>		
<u>Skepticism re: what MD's say</u>		
Mean score	8.94	
Median score	9.0	
Range	4-13	
<u>Skepticism re: what MD's do</u>		
Mean	9.23	
Median	9.0	
Range	6-13	
<u>Social Network</u>		
Mean	31.28	
Median	32.50	
Range	11-47	

### ***Social Network***

The respondents were asked questions which comprised the Lubben Social Network Scale (LSNS). The higher the score the less likely there was a risk for social isolation. The range of scores was from a low of 11 to a high of 47. The average score was 31.3. The literature has suggested that persons with a score of less than 20 would be considered isolated while those scoring 21-25 would be at high risk for social isolation. Scores between 26-30 would be considered to represent a moderate risk for social isolation and while scores of 31 or greater would represent a low risk for social isolation (Rubenstein, Lubben & Mintzer, 1994). Frequency distribution tables of the scores indicate that 11 respondents in the sample scored  $\leq 20$ . Five respondents scored between 21-25 while 15 respondents scored between 26-30 and 47 respondents scored  $\geq 31$ .

### ***Perception Factors of Sample*** (Table 16)

#### ***Severity***

Respondents were requested to choose a number on a scale ranging from 1 to 10 which most accurately represented how severe the harm would be to them if they became constipated. Zero represented no harm at all while 10 represented extreme harm. The mean score for the sample was 5.6 with a median of 5. Interestingly enough 2 respondents (2.6% of the sample) indicated that constipation would cause no harm at all. Twenty-six respondents (33.3% of the sample) chose severity scores between 1-4. Nineteen respondents, 24.2% of the sample, indicated a score of 5 while 21.8% of the sample indicated scores between 6-9. The remaining 14 respondents (17.9% of the sample) indicated that constipation would cause extreme harm and chose a score of 10 on the severity scale.

### ***Susceptibility/Likelihood of experiencing constipation***

When rating themselves against others of their peer group with respect to the likelihood of experiencing constipation, one person did not choose a score. Just over half of the sample, 41 respondents (56.2%) indicated they were “less likely than others” to become constipated while 22 respondents (28.2% of the sample) indicated they were “about as likely as others” to experience constipation.

Table 16  
Perception Factors of Sample (n=78)

<b>Respondent Characteristics</b>	<b># of respondents</b>	<b>% of sample</b>
<b>Severity</b>		
Mean score	5.60	
Median score	5.00	
Range	0-10	
<b>Susceptibility</b>		
Less likely than others	41	56.2
About as likely as others	22	28.2
More likely than others	<u>14</u>	<u>17.9</u>
Total	77	100.0
Missing	1	

The smallest portion of the sample, 17.9% indicated that they were “more likely than others” to experience constipation.

### ***Bivariate Data Analysis for MD recommended Methods***

The characteristics of respondents who utilized physician recommended methods to treat or prevent constipation (MD rec group) were compared to respondents who did not use physician recommended methods (non-MD rec group). The bivariate analysis was conducted with all 78 respondents. Fifty-one respondents did not use physician recommended methods and 27 respondents used at least 1 physician recommended method.

***Modifying Factors*** (Table 17).

Demographically there were no statistical differences between the groups. The mean age for the MD rec group was 76.3 years. This was virtually identical to the non-MD rec group's mean age of 76.2 years.

In terms of gender there were again no significant differences between the two groups. Of the 22 men in the sample, 16 did not use any MD recommended methods and 6 used at least one method recommended by an MD. Of the 56 women in the sample, 35 did not use any MD recommended methods and 21 used at least one method recommended by an MD.

In regards to marital status there were no statistically significant differences between those who were married and those who were not married. Of the 35 respondents who were not married, 25 (71.4%) did not use an MD recommended method and 10 (28.6%) used at least one MD recommended method. Of the 43 respondents who were married, 26 (60.5%) did not use an MD recommended method and 17 (39.5%) used at least one MD recommended method.

Educationally speaking the groups did not differ significantly. For the MD rec group the mean number of years of completed education was 10.8 whereas for the non-MD rec group the mean number of years of completed education was 11.9.

In regards to income, one respondent from each group refused to identify which income category best described their situation. There was no statistically significant difference between the groups. Similarly, in regards to SEFI and area of residence, there were no statistically significant results.



Table 17  
Bivariate Comparison of Modifying Factors of Respondents using MD and Non-MD recommended Methods

<u>Respondent Characteristics</u>	<u>MD rec group</u> n=27 # (%)	<u>Non-MD rec group</u> n=51 # (%)	<u>p</u>
<u>Age</u>			
Mean (years)	76.26	76.22	.975
<u>Gender</u>			
Male	6 (22.2)	16 (31.4)	
Female	21 (77.8)	35 (68.6)	
Total	27 (100.0)	51 (100.0)	.393
<u>Marital Status</u>			
Married	17 (63.0)	26 (51.0)	
Not married	10 (37.0)	25 (49.0)	
Total	27 (100.0)	51 (100.0)	.311
<u>Years of Completed Education</u>			
Mean (years)	10.81	11.94	.159
<u>Income Level</u>			
≤\$9,999	2 ( 7.7)	2 (4.0)	
\$10,000-\$20,999	7 (26.9)	13 (26.0)	
\$21,000-\$30,999	10 (38.5)	17 (34.0)	
\$31,000-\$40,999	4 (15.4)	8 (16.0)	
\$41,000-\$50,999	2 (7.7)	5 (10.0)	
≥\$60,000	1 (3.8)	5 (10.0)	
Total	26 (100.0)	50 (100.0)	
Refused	1	1	.917
<u>Area of Residence</u>			
Worse than average	0 ( 0.0)	1 ( 2.0)	
Average	23 (85.2)	37 (72.5)	
Better than average	4 (14.8)	13 (25.5)	
Total	27 (100.0)	51 (100.0)	.403

### ***Structural Factors*** (Table 18)

Comparison of the structural factors of the MD rec group and the Non-MD rec group revealed a number of statistically significant results. In regards to the number of chronic health conditions the MD rec group had a mean number of 4.4 conditions while the Non-MD rec group had a mean number of 3.2 conditions. This difference was significant ( $p=.019$ ).

In regards to activity limitations, overall the MD rec group had a greater number of limitations when both ADL and IADL activities were combined. The MD rec group

had a mean of 5.5 limitations while the Non-MD rec group had a mean of 3.5 limitations.

This difference was significant ( $p=.014$ ).

Table 18  
Bivariate Comparison of Structural Factors of Respondents using MD and Non-MD recommended Methods

<u>Respondent Characteristics</u>	MD rec group n=27	Non-MD rec group n=51	p
<u>Health Conditions</u>			
Mean Rank Sum	1312.00	1769.00	.009*
Mean	4.41	3.16	.019*
<u>Total Limitations</u>			
Mean Rank Sum	1323.50	1757.50	.006*
Mean	5.4815	3.5294	.014*
<u>Basic ADL Limitations</u>			
Mean Rank Sum	1246.50	1834.50	.028*
Mean	0.8148	0.4314	.075
<u>IADL Limitations</u>			
Mean Rank Sum	1325.00	1756.00	.006*
Mean	2.9742	2.3431	.013*

\*Significance  $\geq 0.05$

### *Sociopsychological & Cue to Action Factors* (Table 19)

The bivariate results of the self-rated health question indicate that there was no statistically significant difference between the MD rec group and the Non-MD rec group. Both groups had very similar splits between those who indicated their health was poor/bad or fair and those who indicated their health was good or excellent. In both cases it was fairly close to a 40%-60% split. Specifically, the MD rec group had 10 respondents (37.0%) who indicated their health was poor/bad or fair while the Non-MD rec group similarly had 18 (35.3%) people who felt their health was poor/bad or fair. At the other end of the spectrum, 17 respondents (63.0%) in the MD rec group felt their health was good or excellent while 33 respondents (64.7%) in the Non-MD rec group indicated their health was good or excellent.

The results of the Multidimensional Health Locus of Control Scale indicated that the sample was internally oriented. In both the MD rec group and the Non-MD rec group the mean scores were highest on the Internal Health Locus of Control Scale as compared to the Powerful Others Health Locus of Control and Chance Health Locus of Control scales. The average scores for the MD rec group versus the Non-MD rec group on the Internal Health Locus of Control scales was 24.9 and 23.2 respectively. There was no statistically significant difference between the scores. The second highest scores were obtained by both groups on the Powerful Other Health Locus of Control scales. There was not a large variation in the mean score in either group. The MD rec group had a mean score of 20.9 while the Non-MD rec group had a mean score of 20.0. Again there was no statistically significant difference between the scores. The lowest mean scores by both groups were obtained on the Chance Health locus of Control scale. The MD rec group scored a mean of 4.7 while the Non-MD rec group scored a mean of 5.4. As with the previous two scales there was no significant difference between the groups on the basis of this scale.

Investigation of the medical skepticism of the two groups revealed little difference in regards to respondents' skepticism involving what physicians say and do. Both groups had lower scores on the skepticism regarding what MD's say scales. The MD rec group had a mean score of 8.6 while the Non-MD rec group had a mean score of 9.1. There was no significant difference between these scores. In regards to skepticism revolving around what MD's do, the MD rec group again had an overall lower mean score of 9.1 while the Non-MD rec group had a higher mean score of 9.3. Again, there was no statistically significant difference between the groups with respect to these scores.

In regards to social contacts and the risk of social isolation, there was no difference statistically significant difference between the MD rec group and the Non-MD rec group. The mean score for both groups was almost identical at 31.5 and 31.2 respectively.

Table 19  
Bivariate Comparison of Sociopsychological & Cue to Action Factors of Respondents using MD and Non-MD recommended Methods

<u>Respondent Characteristics</u>	<u>MD rec group</u> n=27 # (%)	<u>Non-MD rec group</u> n=51 # (%)	<u>p</u>
<u>Self Rated Health</u>			
Poor/bad or Fair	10 (37.0)	18 (35.3)	
Good or Excellent	17 (63.0)	33 (64.7)	
Total	27(100.0)	51(100.0)	.879
<u>Health Locus of Control</u>			
<u>Internal</u>			
Mean score	24.9	23.2	.198
<u>Powerful Others</u>			
Mean score	20.9	20.0	.506
<u>Chance</u>			
Mean score	4.7	5.4	.156
<u>Medical Skepticism</u>			
<u>Skepticism re: what MD's say</u>			
Mean score	8.6	9.1	.360
<u>Skepticism re: what MD's do</u>			
Mean	9.1	9.3	.239
<u>Social Network</u>			
Mean	31.5	31.2	.870

### ***Perception Factors*** (Table 20)

Perceptions of severity and susceptibility were measured as previously described. Those respondents in the MD rec group chose a mean score of 5.9 to indicate how severe the harm would be to them if they became or experienced constipation. Similarly, the Non-MD rec group chose a mean score of 5.5 on the same scale. There was no significant difference between these scores.

In regards to susceptibility to constipation over half of the respondents in both groups indicated they were 'less likely than others' to experience constipation. Fifty-one point nine percent (51.9% -14 respondents) in the MD rec group and 54.0% (27 respondents) in the Non-MD rec group all described themselves as being 'less likely than others' to experience constipation. Six respondents (22.2%) in the MD rec group indicated they were 'about as likely as others' to experience constipation while 7 respondents (25.9%) in this group indicated they were 'more likely than others' to experience constipation. Thirty-two percent (32.0% - 16 respondents) in the Non-MD rec group indicated they were 'about as likely as others' to experience constipation while a further 14.0% (7 respondents) in this group believed they were 'more likely than others' to experience constipation. Overall there was no statistically significant difference between the two groups in regards to susceptibility to constipation.

Table 20  
Bivariate Comparison of Perception Factors of Respondents using MD and Non-MD recommended Methods

<u>Respondent Characteristics</u>	<u>MD rec group</u> n=27 # (%)	<u>Non-MD rec group</u> n=51 # (%)	<u>p</u>
<u>Severity</u>			
Mean	5.9	5.5	.507
<u>Susceptibility</u>			
Less likely than others	14 (51.9)	27 (54.0)	
About as likely as others	6 (22.2)	16 (32.0)	
More likely than others	<u>7 (25.9)</u>	<u>7 (14.0)</u>	.373
Total	27 (100.0)	50 (100.0)	
Missing	0	1	

#### ***Multivariable Findings for MD Recommended Methods***

Hierarchical multiple logistic regression analysis was conducted to investigate the factors which might be associated with the use of MD recommended methods to prevent

constipation or maintain normal bowel function versus non-MD recommended methods. Additionally, a second hierarchical multiple logistic regression analysis was conducted to investigate the factors which might be associated with the use of professional recommended methods to prevent constipation or maintain normal bowel function versus non-professionally recommended methods. This variable included methods recommended by any type of professional including: MD, RN, Pharmacist, Dietician, OT, PT as compared to non-professional sources such as alternative care providers, family/friends, literature/advertising; self-taught methods etc.

In both models the selection of variables for inclusion was based upon the results of bivariate analysis, multicollinearity testing and theoretical support in the literature. These inclusion criteria are supported in the literature (Hawranik, 1997; Hosmer & Lemeshow, 1989). For each regression model, the variables were entered in blocks according to HBM conceptual groupings. A review of the literature did not reveal a standardized approach to the order of entering HBM conceptual groupings into the logistic regression (Becker et.al, 1977; Champion, 1985; Dolman & Chase, 1996; Fulton, Buechner, Scott, DeBuonon, Feldman, Smith & Kovenock, 1991; Glanz et al, 1999; Nexoe, Kragstrup & Sogaard, 1998). As such the order of inclusion was determined by the researcher and the following order was used: perception variables of severity and susceptibility; modifying/demographic factors of gender, age, marital status, years of education and area of residence; modifying/sociopsychological factors of self rated health, health locus of control, medical skepticism and social network; and lastly structural factors of chronic health conditions and total ADL/IADL limitations.

The log-likelihood, which is used as the criterion for selecting parameters in the logistic regression model, is presented as the log-likelihood when multiplied by -2. The reason behind multiplying the log-likelihood by -2 is that with this adjustment it has an approximate chi-square distribution and is presented as a positive statistic. It is abbreviated as -2LL and smaller -2 LL values mean that the model fits the data better; a perfect model has a -2 LL value of zero. Consequently the larger -2 LL value the worse is the prediction of the dependent variable (George & Mallery, 2001; Menard, 1995). The beta ( $\beta$ ) indicates the effect of the predictor variable on the dependent variable. A positive  $\beta$  indicates a corresponding increase in the value of the dependent variable whereas a negative value for  $\beta$  indicates a decrease in the value of the dependent variable (George & Mallery, 2001). The Wald is the measure of significance of  $\beta$  for the given variable. Higher values of the Wald in combination with the degrees of freedom indicate significance (George & Mallery, 2001). The R is the significance of the Wald test (George & Mallery, 2001).

#### *Use of MD Recommended Methods*

The results of the logistic regression model for the use of methods recommended by MD are presented in Table 21. The first block of variables namely, severity and susceptibility, resulted in a non-significant Chi-square and a large -2LL (97.66) indicating that the perception variables of severity and susceptibility did not contribute to the goodness-of-fit of the model to the data. In successive steps the results were similarly not significant. As such none of the independent variables contributed much to the explanation of the outcome variable. Of all the steps the final step 4 wherein the independent variables of number of chronic health conditions and number of limitations

in ADL/IADL were entered fared the best. However these variables did not make a significant contribution to the explanation of the use of MD recommended methods to treat constipation or to maintain normal bowel functioning.



Table 21  
Hierarchical Stepwise Logistic Regression Model for Use of MD recommended methods

<u>Independent Variables</u>	Step 1			Step 2			Step 3			Step 4			
	$\beta$	Wald	R	$\beta$	Wald	R	$\beta$	Wald	R	$\beta$	Wald	R	
<b><u>Perception Variables</u></b>													
Severity	.04	.17	ns										
Susceptibility(1)	-.64	1.05	ns										
Susceptibility (2)	-.95	1.71	ns										
<b><u>Modifying/Demographic Factors</u></b>													
Gender				.55	.84	ns							
Age				-.002	.003	ns							
Marital Status				.83	2.38	ns							
Years of Education				-.11	1.91	ns							
Area of Residence				-.74	1.26	ns							
<b><u>Modifying/Sociopsychological Factors</u></b>													
Self rated Health							-.16	.08	ns				
Internal Health Locus of Control							.07	1.89	ns				
Powerful Others Health							-.003	.004	ns				
Chance Health Locus of Control							.07	1.97	ns				
Medical Skepticism re: what MD's say							-.17	1.54	ns				
Medical Skepticism re: what MD's do							-.07	.23	ns				
Social Network							.01	.03	ns				
<b><u>Structural Factors</u></b>													
Chronic Health Conditions										.18	2.21	ns	
Limitations in adl/iadl										.13	2.25	ns	
				-2LL= 97.66			-2LL=93.89			-2LL=94.59			-2LL=92.42
				Model $\chi^2= 6.76$			Model $\chi^2=10.11$			Model $\chi^2=5.15$			Model $\chi^2= 6.4$
				df=7 p=.45			df=8 p=.26			df=8 p=.74			df=8 p=.59

### *Bivariate Data Analysis for Professional Recommended Methods*

The characteristics of respondents who utilized professional recommended methods to treat or prevent constipation (Prof rec group) were compared to respondents who did not use professionally recommended methods (Non-Prof rec group). The bivariate analysis was conducted with all 78 respondents. Forty-six respondents did not use professionally recommended methods and 32 respondents used at least 1 professionally recommended method.

*Modifying Factors* (Table 22).

Demographically there were no statistical differences between the groups. The mean age for the Prof rec group was 76.6 years. This was virtually identical to the non-Prof rec group's mean age of 75.9 years.

In terms of gender there were again no significant differences between the two groups. Of the 22 men in the sample, 16 did not use any professionally recommended methods and 6 used at least one method recommended by a professional. Of the 56 women in the sample, 30 did not use any professionally recommended methods and 26 used at least one method recommended by a professional.

In regards to marital status there were no statistically significant differences between those who were married and those who were not married. Of the 35 respondents who were not married, 21 (60.0%) did not use a professionally recommended method and 14 (40.0%) used at least one professionally recommended method. Of the 43 respondents who were married, 25 (58.1%) did not use a professionally recommended method and 18 (41.9%) used at least one professionally recommended method.

Educationally speaking the groups did not differ significantly. For the Prof rec group the mean number of years of completed education was 11.1 whereas for the non-Prof rec group the mean number of years of completed education was 11.9.

In regards to income, one respondent from each group refused to identify which income category best described their situation. There was no statistically significant difference between the groups. Similarly, in regards to SEFI and area of residence, there were no statistically significant results.

Table 22  
Bivariate Comparison of Modifying Factors of Respondents using Professional recommended and Non-Professional recommended Methods

<u>Respondent Characteristics</u>	<u>Prof rec group</u> n=32 # (%)	<u>Non-Prof rec group</u> n=46 # (%)	<u>p</u>
<u>Age</u>			
Mean (years)	76.6	75.9	.649
<u>Gender</u>			
Male	6 (18.8)	16 (34.8)	
Female	<u>26 (81.3)</u>	<u>30 (65.2)</u>	.122
Total	32 (100.0)	46 (100.0)	
<u>Marital Status</u>			
Married	18 (56.3)	25 (54.3)	
Not married	<u>14 (43.8)</u>	<u>21 (45.7)</u>	.868
Total	32 (100.0)	46 (100.0)	
<u>Years of Completed Education</u>			
Mean (years)	11.1	11.9	.285
<u>Income Level</u>			
≤\$9,999	2 (6.5)	2 (4.4)	
\$10,000-\$20,999	10 (32.3)	10 (22.2)	
\$21,000-\$30,999	11 (35.5)	16 (35.6)	
\$31,000-\$40,999	5 (16.1)	7 (15.6)	
\$41,000-\$50,999	2 (6.5)	5 (11.1)	
≥\$60,000	<u>1 (3.2)</u>	<u>5 (11.1)</u>	
Total	31 (100.0)	45 (100.0)	.742
Refused	1	1	
<u>Area of Residence</u>			
Worse than average	0 ( 0.0)	1 ( 2.2)	
Average	27 (84.4)	33 (71.7)	
Better than average	<u>5 (15.6)</u>	<u>12 (26.1)</u>	.361
Total	32 (100.0)	46 (100.0)	

### ***Structural Factors (Table 23)***

Comparison of the structural factors of the Prof rec group and the Non-Prof rec group revealed a number of statistically significant results. In regards to the number of chronic health conditions the Prof rec group had a mean number of 4.3 conditions while the Non-Prof rec group had a mean number of 3.2 conditions. This difference was significant ( $p=.034$ ).

In regards to activity limitations, overall the Prof rec group had a greater number of limitations when both ADL and IADL activities were combined. The Prof rec group

had a mean of 5.3 limitations while the Non-Prof rec group had a mean of 3.4 limitations.

This difference was significant ( $p=.014$ ).

Table 23

Bivariate Comparison of Structural Factors of Respondents using Professional recommended and Non-Professional recommended Methods

<u>Respondent Characteristics</u>	<u>Prof rec group</u> n=32	<u>Non-Prof rec group</u> n=46	<u>p</u>
<u>Health Conditions</u>			
Mean Rank Sum	1505.5	1575.5	.013*
Mean	4.3	3.2	.034*
<u>Total Limitations</u>			
Mean Rank Sum	1539.5	1541.5	.005*
Mean	5.3	3.4	.014*
<u>Basic ADL Limitations</u>			
Mean Rank Sum	1405.5	1675.5	.094
Mean	0.7188	0.4565	.211
<u>IADL Limitations</u>			
Mean Rank Sum	1551.5	1529.5	.003*
Mean	4.6	2.9	.008*

\*Significance  $\geq 0.05$

### *Sociopsychological & Cue to Action Factors (Table 24)*

The bivariate results of the self-rated health question indicate that there was no statistically significant difference between the Prof rec group and the Non-Prof rec group. Specifically, the Prof rec group had 12 respondents (37.5%) who indicated their health was poor/bad or fair while the Non-Prof rec group had 16 (34.8%) people who indicated their health was poor/bad or fair. At the other end of the spectrum, 20 respondents (62.5%) in the Prof rec group felt their health was good or excellent while 30 respondents (65.2%) in the Non-MD rec group indicated their health was good or excellent.

In regards to the Multidimensional Health Locus of Control Scale both the Prof rec group and the Non-Prof rec group had the highest mean scores on the Internal Health Locus of Control scale as compared to the Powerful Others Health Locus of Control and Chance Health Locus of Control scales. The average scores for the Prof rec group versus the Non-Prof rec group on the Internal Health Locus of Control scales was 24.5 versus

23.3 respectively. There was no statistically significant difference between these scores. The second highest scores were obtained by both groups on the Powerful Other Health Locus of Control scales. There was not a large variation in the mean score in either group. The Prof rec group had a mean score of 20.8 while the Non-Prof rec group had a mean score of 19.9. Again there was no statistically significant difference between these scores. The lowest mean scores by both groups were obtained on the Chance Health Locus of Control scale. The Prof rec group scored a mean of 19.4 while the Non-Prof rec group scored a mean of 18.1. As with the previous two scales there was no significant difference between the groups on the basis of this scale.

Investigation of the medical skepticism of the two groups revealed little difference in regards to respondents' skepticism involving what physicians say and do. Both groups had lower scores on the skepticism regarding what MD's say scales. The Prof rec group had a mean score of 8.8 while the Non-Prof rec group had a mean score of 9.0. There was no significant difference between these scores. In regards to skepticism revolving around what MD's do, the Prof rec group again had an overall lower mean score of 9.1 while the Non-Prof rec group had a higher mean score of 9.3. Again, there was no statistically significant difference between the groups with respect to these scores.

In regards to social contacts and the risk of social isolation, there was no difference statistically significant difference between the Prof rec group and the Non-Prof rec group. The mean score for both groups was almost identical at 31.0 and 31.4 respectively.

Table 24  
Bivariate Comparison of Sociopsychological & Cue to Action Factors of Respondents using Professional recommended and Non-Professional recommended Methods

<u>Respondent Characteristics</u>	<u>Prof rec group</u> n=32 # (%)	<u>Non-Prof rec group</u> n=46 # (%)	<u>p</u>
<u>Self Rated Health</u>			
Poor/bad or Fair	12 (37.5)	16 (34.8)	.806
Good or Excellent	20 (62.5)	30 (65.2)	
Total	32 (100.0)	46 (100.0)	
<u>Health Locus of Control</u>			
<u>Internal</u>			
Mean score	24.5	23.3	.326
<u>Powerful Others</u>			
Mean score	20.8	19.9	.505
<u>Chance</u>			
Mean score	19.4	18.1	.292
<u>Medical Skepticism</u>			
<u>Skepticism re: what MD's say</u>			
Mean score	8.8	9.0	.612
<u>Skepticism re: what MD's do</u>			
Mean	9.1	9.3	.516
<u>Social Network</u>			
Mean	31.0	31.4	.790

### *Perception Factors* (Table 25)

Perceptions of severity and susceptibility were measured as previously described. Those respondents in the Prof rec group chose a mean score of 6.1 to indicate how severe the harm would be to them if they became or experienced constipation. Similarly, the Non-Prof rec group chose a mean score of 5.3 on the same scale. There was no significant difference between these scores.

In regards to susceptibility to constipation over half of the respondents in both groups indicated they were 'less likely than others' to experience constipation. Fifteen respondents (46.9%) in the Prof rec group and 26 respondents (57.8%) in the Non-Prof rec group all described themselves as being 'less likely than others' to experience constipation. Nine respondents (28.1%) in the Prof rec group indicated they were 'about

as likely as others' to experience constipation while 8 respondents (25.0%) in this group indicated they were 'more likely than others' to experience constipation. Thirteen respondents (28.9%) in the Non-Prof rec group indicated they were 'about as likely as others' to experience constipation while a further 6 respondents (13.3%) in this group believed they were 'more likely than others' to experience constipation. Overall there was no statistically significant difference between the two groups in regards to susceptibility to constipation.

Table 25  
Bivariate Comparison of Perception Factors of Respondents using Professional recommended and Non-Professional recommended Methods

<u>Respondent Characteristics</u>	<u>Prof rec group</u> n=32 # (%)	<u>Non-Prof rec group</u> n=46 # (%)	<u>p</u>
<u>Severity</u>			
Mean	6.1	5.3	.190
<u>Susceptibility</u>			
Less likely than others	15 (46.9)	26 (57.8)	
About as likely as others	9 (28.1)	13 (28.9)	
More likely than others	8 (25.0)	6 (13.3)	.402
Total	32 (100.0)	45 (100.0)	
Missing	0	1	

### *Multivariable Findings for Professional Recommended Methods*

To investigate if there was an impact on the dependent variable (ie. the use of professionally recommended methods to treat or prevent constipation versus non-professionally recommended methods) a second logistic regression model was developed. The results of the logistic regression model for the use of professionally recommended methods are presented in Table 26 (page 150). The entry of independent variables into the model was as described beforehand in the previously discussed logistic regression model.

Unfortunately the results were little different than the Hierarchical Stepwise Logistic Regression Model for Use of MD recommended methods. The first block of variables namely, severity and susceptibility, resulted in a non-significant Chi-square and a large  $-2LL$  (101.40) indicating that the perception variables of severity and susceptibility did not contribute to the goodness-of-fit of the model to the data. In successive steps the results were similarly not significant. As such none of the independent variables contributed much to the explanation of the outcome variable. Of all the steps, the final step 4, provided some improvement. In this block the independent variables of number of chronic health conditions and number of limitations in ADL/IADL were entered. Again, however, the variables did not make a significant contribution to the explanation of the use of professionally recommended methods to treat constipation or to maintain normal bowel functioning.

### ***Summary***

This chapter presented the study findings and results of data analysis. Thematic analysis of the qualitative data was initially discussed. Univariate findings and bivariate findings followed. Lastly results of testing for multicollinearity and multivariable findings concluded the chapter.



Table 26  
Hierarchical Stepwise Logistic Regression Model for Use of Professional recommended methods

<u>Independent Variables</u>	Step 1			Step 2			Step 3			Step 4		
	$\beta$	Wald	R	$\beta$	Wald	R	$\beta$	Wald	R	$\beta$	Wald	R
<b><u>Perception Variables</u></b>												
Severity	.10	1.31	ns									
Susceptibility (1)	-.81	1.64	ns									
Susceptibility (2)	-.57	.65	ns									
<b><u>Modifying/Demographic Factors</u></b>												
Gender				.90	2.36	ns						
Age				.02	.24	ns						
Marital Status				.42	.68	ns						
Years of Education				-.06	.54	ns						
Area of Residence				-.59	.94	ns						
<b><u>Modifying/Sociopsychological Factors</u></b>												
Self rated Health							-.12	.05	ns			
Internal Health Locus of Control							.05	1.10	ns			
Powerful Others Health										.004	.006	ns
Chance Health Locus of Control							.05	.91	ns			
Medical Skepticism re: what MD's say							-.08	.43	ns			
Medical Skepticism re: what MD's do							-.10	.50	ns			
Social Network							-.01	.08	ns			
<b><u>Structural Factors</u></b>												
Chronic Health Conditions										.14	1.33	ns
Limitations in adl/iadl										.14	2.61	ns
				-2LL=101.40			-2LL=99.56			-2LL=102.21		
				Model $\chi^2=12.22$			Model $\chi^2=9.35$			Model $\chi^2=13.99$		
				df=8 p=.14			df=8 p=.31			df=8 p=.08		
										-2LL=98.12		
										Model $\chi^2=5.91$		
										df=7 p=.55		

## **Chapter Six**

### **Discussion and Implications**

The purpose of this exploratory study was to examine the factors associated with the older adults' health behaviour practices to maintain normal bowel functioning and prevent constipation. The following chapter opens with an overview of the theoretical framework, the Health Belief Model (HBM) used for this study and its likely impact on the study findings. This is followed by a discussion of the study findings with proposals for possible explanations. Specifically four study areas are examined. These include 1) factors associated with use or non-use of physician recommended/prescribed methods; 2) factors associated with use or non-use of professional recommended methods; 3) methods used by the respondents to maintain normal bowel functioning and prevent constipation; 4) consultation practices regarding methods used and 5) definitions of normal bowel functioning and constipation. In the last section identification of factors that limited study generalizability is undertaken followed by discussions of implications for nursing practice and future research. The chapter closes with a brief conclusion.

#### ***Explanations for Research Findings***

##### ***Overview of Theoretical Framework and Possible Impact on Findings***

The HBM was originally created in the 1950's by a group of social psychologists to provide a framework for the study of why people did not participate in the large-scale health prevention programs of the day (Rosenstock, 1974). The HBM suggests that the likelihood of action is based upon the interplay of the value an individual attaches to a goal and the individual's perceptions regarding the likelihood of achieving the goal utilizing certain behaviours or actions (Becker, 1990; Duncan & Travis, 1998). The framework attempts to explain action in a choice situation as it relates to an individual's

decision about possible health behaviours. It assumes that self-care health behaviours are due to subjective perceptions and that individuals have some volitional control over their behaviour (Prohaska, 1998). As such the HBM attempts to explain health-related behaviour at the individual decision-making level (Mikhail, 1981). There is substantial empirical evidence supporting the contribution of the HBM concepts in explaining and predicting health-related behaviours (Janz & Becker, 1984). A criticism of the model is that the focus on beliefs limits the scope of the model, as behaviour cannot always be accounted for on this basis. Other drawbacks and limitations of the HBM in the literature include: 1) a lack of uniformity in testing the model and as such there is no uniformity to conceptualization and variable operationalization (Mikhail, 1981; Poss, 2001; Yarbrough & Braden, 2001); 2) there are no refined or standardized tools to measure the concepts (Maiman, Becker, Kirscht, Haefner & Drachman, 1977; Poss, 2001; Yarbrough & Braden, 2001); 3) there is lack of congruence between studies with respect to overall application of the model in regards to relationships between variables being additive or multiplicative and whether they are linear or non-linear (Poss, 2001; Yarbrough & Braden, 2001); 4) because the HBM is a psychosocial model its explanatory power is limited to the extent that attitudes and beliefs influence action (Poss, 2001; Rosenstock, 1990) and 5) cultural and normative factors are not readily acknowledged in the HBM and as such the model places responsibility of action on the shoulders of the individual. This may not be entirely acceptable as certainly there are other factors such as family history, social connectedness, prior health experiences as well as larger issues like poverty and public policy which can all impact on health seeking behaviour and use/non-

use/over-use of different types of health care systems and treatments (Burns, 1992; Duncan & Travis, 1998; Poss, 2001).

A review of 14 different models used in the literature to explain health actions, including the HBM, was undertaken by Cummings, Becker and Maile (1980). The suggestion was put forth that no one model would be able to explain health actions in their entirety however if elements of several models were combined the prediction and explanation of health behaviours would be greatly improved (Cummings, Becker and Maile, 1980). Despite the noted limitations a total departure from the HBM is not warranted as its basic structure has been extensively researched in varying degrees. Burns (1992) suggests constructs such as emotional influences, social dynamics and normative expectations be included. Poss (2001) further supports the decision not to abandon the HBM but suggests that it be combined with a more culturally based model such as the Theory of Reasoned Action in order to build upon its strengths and compensate for its limitations.

In light of the foregoing discussion, it is reasonable to believe that the choice to utilize the HBM framework as the sole theoretical foundation for this thesis project may in fact have predisposed the study to findings of limited significance. In particular, other studies have noted that the HBM variables in combination or alone have limited success in accounting for variability. In fact, the variability accounted for is reported by some to be as high as 47% and as low as 6% (McDonald-Miszczak, Wister & Gutman, 2001; Yarbrough & Braden, 2001). The variables included in this thesis study were found to have little to no success in accounting for the outcome variable when observed individually or in combination.

***Factors associated with use or non-use of physician recommended/prescribed methods***

Review of the bivariate analysis results as they pertain to use of physician recommended/prescribed methods indicates limited statistically significant findings. There were in fact no statistical differences between the MD rec group (respondents who utilized physician recommended/prescribed methods) and the non-MD rec group (those who did not use physician recommended/prescribed methods) in regards to modifying factors (demographics), sociopsychological factors (self rated health, health locus of control and medical skepticism) or perception factors (perceived severity and susceptibility). In fact the only factors wherein a statistical difference was found at the bivariate level pertained to structural factors. The structural factors conceptual grouping consisted of measures of the number of chronic health conditions and functional limitations (ADL and IADL) that respondents had. In comparison to the non-MD rec group the MD rec group had a higher average number of chronic health conditions, namely, 4.4 versus 3.2. In regards to ADL limitations the MD rec group had a mean of 0.8 ADL limitations whereas the non-MD rec group had a mean of 0.4 limitations. Similarly in regards to IADL limitations the MD re group had a higher mean number of limitations as compared to the non-MD rec group, namely 2.9 versus 2.3. While these findings were statistically significant they are also theoretically plausible as those with poorer function and more health concerns are likely to visit their family physician on a more frequent basis and thus have a greater likelihood of receiving recommendations for methods to prevent constipation simply based on frequency of contact with their MD.

***Factors associated with use or non-use of professional recommended methods***

Review of the bivariate analysis results as they pertain to use of professional recommended methods (Prof rec group) (respondents who utilized physician, nurse, pharmacist, physiotherapy or dietician recommended methods) versus non-professional recommended methods (respondents who did not utilize physician, nurse, pharmacist, physiotherapy or dietician recommended methods but rather utilized methods recommended by family members, friends, self taught methods, methods influenced by literature or advertising) (Non-Prof rec group) revealed results similar to those found with analysis of the Physician versus Non-Physician recommended/prescribed methods. There were a limited number of statistically significant findings. In regards to age, gender, marital status, income and education there were no statistical differences between the Prof rec group and the Non-Prof rec group. Similarly, in regards to SEFI and area of residence there were again no differences between the groups. Comparison of the structural factors revealed results similar to those found with the MD rec group versus the Non-MD rec group. The Prof rec group had a larger mean number of chronic health conditions when compared to the Non-Prof rec group. The means were 4.3 and 3.2 respectively. Similarly the Prof rec group had a greater number of activity limitations when both ADL and IADL activities were combined. The Prof rec group had a mean of 5.3 limitations whereas the Non-Prof rec group had a mean of 3.4 limitations. While these findings were statistically significant they were also theoretically plausible as well. It is reasonable to assume that again, like those in the MD rec group, those in the Prof rec group may have been realistically more likely to visit their physician or be in contact with a variety of health care professionals simply based on the number of health conditions

and activity limitations they had. As such they would again have a greater likelihood of receiving recommendations for methods to prevent constipation simply based on the frequency of contact with various members of the health care team. As well this group may have actually been receiving in home health care services through the Home Care program or they may have been attending a community program with access to various health professionals. Although these factors were not investigated in the study they are plausible explanations for increased contact with various health professionals. As such respondents would again have a greater likelihood of receiving recommendations from professional sources.

A comment is required here in regards to a plausible explanation as to why greater numbers of significant findings and relevant variables were not found. It is apparent that the scales utilized in this study may have in fact been a large contributor to the non-significant findings. Review of the psychometric properties of the instruments (reported elsewhere) utilized in this thesis study indicates that some of them had reliabilities lower than 0.70. According to the literature instruments with such low reliabilities are highly susceptible to random, extraneous influences and as such are predisposed to being unreliable (Polit & Hungler, 1999). It may be then that relationships do exist between independent and dependent study variables however because of the influence of the unreliable tools the relationships were not found.

#### ***Methods used by Respondents to maintain normal bowel functioning and prevent constipation***

In this thesis study it was of interest to find out which types of methods were being used by the respondents. There were two categories of methods used. These included lifestyle methods and bowel function agents. Lifestyle methods used included

dietary practices, exercise and alternative therapies such as reflexology and massage therapy. Bowel function agents included ingestion of alternative herbal products and mega-vitamin products, traditional laxatives as well as the use of pharmaceutical agents inserted into bodily orifices, like enemas and suppositories.

The majority of the respondents, 55.1% (43 respondents), used only lifestyle methods while 44.9% (35 respondents) used a combination of bowel function agents and lifestyle agents. Interestingly 94.8% (74 respondents) used at least 1 lifestyle method on a daily basis to prevent constipation and maintain bowel regularity. The average number of lifestyle methods used daily was 4.1. The most frequently mentioned daily dietary practices in descending order respectively were fresh fruit or vegetables, water, and bran. Walking was the most frequently identified daily exercise. It is interesting to note that compared to the literature this study found a higher proportion of respondents using lifestyle methods to maintain bowel function and prevent constipation.

A study by Wolfson and colleagues (1993) (N=70) found that only 7% mentioned exercise and 4% mentioned routine bowel habits to manage or prevent constipation. In contrast to the Wolfson et al. (1993) study where 27% (N=70) used a combination of dietary and medication, this thesis study found 44.9% (35 respondents) used a combination of methods, which included dietary, exercise and medication. Of the medications used by the Wolfson et al. (1993) sample 50% used stool softeners and 24% used bulking agents. In this thesis study 4 respondents used stool softeners (11.4%) and 10 respondents (28.6%) used bulking agents. As in this thesis study, the Wolfson et al (1993) study did not consider bran to be a bulking laxative agent but rather a dietary method. Review of the literature indicates an inconsistency as to whether bran is



considered to be a bulking agent or a dietary method (Andersson, Bosaeue, Falkheden & Melkersson, 1979; Brocklehurst, 1977; Darnton-Hill, Suomela & Nair, 1999; Fioramonti & Buéno, 1994; Harari, Gurwitz, Avorn, Bohn & Minaker, 1996,1997; Koch & Hudson, 2000; Lennard-Jones, 1994; Sonnenberg, Everhart & Brown, 1994; Woodward, 1999). This certainly raises the question as to whether this could be an influencing factor in the high rates of reported laxative use by older adults in the literature. To illustrate: if bran was considered a laxative bulking agent in this thesis study then the use of bowel function agents used would increase to 61.5% of the entire sample and the percentage of respondents using bulking laxative agents would rise to 47.9%.

In the Wolfesen et al. (1993) study 19% used stimulant laxatives while 12% used osmotics. In comparison this thesis study found 42.9% (15 respondents) used stimulant laxatives while only one respondent used an osmotic (2.9%). The most frequently identified stimulant laxative was Senokott. Two respondents (5.7%) used a saline laxative, specifically Milk of Magnesia, 8 respondents (22.9%) used a herbal laxative and 7 respondents (20%) used suppositories or enemas. There were 3 respondents who used alternative type methods. These included bee pollen, vitamin C compound and cod liver oil. Unfortunately a search of the literature failed to produce other studies providing such a specific breakdown of the particular types of laxatives utilized in either the community or institutionalized older adults. The closest description is provided by Heaton and Cripps (1993) in their study of 1892 subjects from England (aged 25-69 years). These researchers found that their subjects identified 25 different laxatives. The most popular were identified as follows: 27% used phenolphthalein preparations (chocolate based);

23% used senna-based products and 12% used magnesium compounds (Heaton & Cripps, 1993).

The literature indicates that polypharmacy has been associated with self reported constipation (Campbell et al., 1993; Harari et al., 1995; Kinnunen, 1991; Whitehaed et al., 1989) and that number of medications is an important predictor of constipation (Stewart, Moore, Marks & Hale, 1992). A study of 694 institutionalized older Americans by Harari and colleagues in 1995 identified some correlates of laxative use. In particular, poor mobility, Parkinson's disease, diabetes mellitus and the use of certain medications (iron, calcium channel blockers and antidepressants with moderate to strong anticholinergic effects) were significantly correlated to the use of laxatives in the study sample. Additionally another finding of particular concern was brought to light in review of the literature: medications are sometimes used to counteract the adverse effects of other medications and symptoms, which are undiagnosed (American Geriatrics Society, 1996; Harari et al, 1995; Montamat, Cusack & Vestal, 1989). Older persons reportedly use two to three times the number of both prescription and over-the-counter medications as compared to younger adults (American Geriatric Society, 1996). Respondents in this thesis study were not asked to identify the type or number of non-laxative medications they were taking nor were they asked to identify which symptoms of constipation they were currently experiencing. These two variables certainly may have provided additional insight into which factors correlate with the use of type of method(s) used to prevent constipation and maintain normal bowel function.

### *Consultation Practices regarding Methods Used*

In this study, the sources of recommendation for the various methods chosen by respondents to maintain normal bowel functioning and prevent constipation were gathered. Given the suggestion in the literature that many laxatives are used by older adults and that many prescriptions are written for laxatives the assumption could be correctly made that physicians would likely be a prominent source of recommendations for various methods to prevent constipation and maintain normal bowel function (Koch & Hudson, 2000; O'Keefe, et al., 1995). The results of this thesis study did not support this assumption. In fact there were only 27 respondents, or 34.6% of the sample who indicated that at least one of the methods they described was recommended for use by their physician. This finding could have been influenced by a number of factors namely; overall health of the sample; availability of family MD and current state of bowel health.

The sample may have been made up of relatively healthy persons thus lessening the chance that they would seek medical care from a physician. In regards to health status and physician consultation practices, the literature indicates that older adults who have greater numbers of symptoms, more chronic conditions and higher levels of physical/functional limitation are likely to consult physicians at greater rates than their counterparts with fewer concerns (Pendry, Barrett & Victor, 1998). Similarly, Strain (1993) indicated that older adults who define health in terms of functioning, (greater functional limitations means poorer overall health) use more services than those who define health in terms of a sense of well-being. In terms of this thesis study and the MD rec group versus the non-MD rec group the average number of health concerns were 4.4 and 3.2 respectively. In this thesis study, the overall average number of health concerns

was 3.6. This is lower than the average number of self-reported health problems reported by individuals aged 65 and older in the 1991-92 Manitoba Study on Health and Aging (MSHA)(Centre on Aging, 1996). Similarly, in this thesis study the men had 3.7 chronic health concerns and the women had 3.6 chronic health concerns. These are lower averages than those reported in the 1991-92 MSHA (Centre on Aging, 1996). At that time the average number of health problems for men and women aged 65 and older were 4.0 and 4.8 respectively. Although health is not only measured by the number of chronic conditions a person has, certainly it is one indicator of overall health and as such it appears that this study sample was in fact relatively healthy when compared to 1991-92 provincial averages.

Interestingly, in a national study of health status of older adults using results from the 1998-1999 Canadian National Population Health Survey, Prus and Gee (2001) found that there was a decrease in the prevalence of certain chronic conditions in older adults and that today's older adults lead healthier lifestyles. This sentiment is echoed by Weaver (2001) wherein she also indicates that American persons age 65 and older tend to take better care of themselves when compared to younger adults. Older adults are less likely to smoke, be overweight or drink alcohol (Weaver, 2001). Although no specific measure of 'healthy lifestyle' was undertaken in this study, it is apparent that the majority of respondents (55.1%) used what could be considered as 'healthy' methods to deal with constipation concerns, namely diet, exercise and fluid intake.

A second possible factor, which could have influenced the study findings, is related to physician accessibility. It is quite possible that the respondents did not have a family physician or they may not have had a doctor whom they saw on a regular basis. As such

it could be that respondents did not have a regular practitioner to speak with or if they had someone they met with irregularly respondents could realistically have been less likely to discuss bowel concerns with that practitioner. This would necessarily impact on the likelihood of obtaining recommendations from a medical physician.

Thirdly the current state of bowel health may have been an influencing factor. The respondents were not specifically asked about the current state of their bowels nor was an evaluation of immediate constipation concern undertaken. As such respondents may not have been experiencing constipation at the time of the interview or they may not have experienced constipation in the recent past and so the likelihood of speaking with a physician about the concern would necessarily be less.

In regards to health professional consultation and recommendation only 18 respondents indicated that at least one of the methods they used was recommended by either a registered nurse (RN), pharmacist, occupational therapist (OT), a physio therapist (PT) or a registered dietician (RD). Specifically, 10 respondents indicated an RN had recommended at least one method to them and 3 respondents indicated that a pharmacist had recommended at least one method to them. The remaining 5 respondents indicated either a RD or a PT recommended at least one method to them. There were no recommendations from OT's. In light of current literature this finding is not surprising. In fact Sheehy and Hall (1998) indicate that dieticians, pharmacists and physiotherapists are poorly consulted when it comes to issues of constipation and bowel maintenance.

The third avenue of consultation evidenced in this thesis study was social or lay consultation. The literature suggests that social communication is an important coping procedure (Cameron, Leventhal & Leventhal, 1993; Lens, 1984; Palo Stoller, 1998).

Social interaction and social influence shape both health and illness behaviour. Lay consultation can have a strong impact on both self-care behaviour and medical consultation practices. The literature suggests that the lay consultation process is one of the most influential with respect to what should be done about health problems (Joos & Hickam, 1990). Many people seek out a lay consultant instead of, prior to or after seeking consultation with a medical professional (Furstenberg & Davis, 1984; Palo Stoller, 1998; Palo Stoller & Forster, 1994; Strain, 1990). In this thesis study the majority of recommendations for methods to prevent constipation and maintain normal bowel function came from social or lay consultation. There were 46 respondents who indicated that no professional had recommended any methods to them. Rather these respondents had received recommendations from various sources including family members, friends, alternative care providers, literature, advertising and methods, which they taught themselves or discerned on their own through a "trial and error" phase. Fifteen respondents indicated that at least one method they used was recommended by a family member (family members could include spouse, sibling(s), (grand) children; friends) and 18 respondents indicated that at least one method was recommended by literature or advertising. These findings are in keeping with a study done by Chappell, Strain & Badger (1988) wherein 70% (N=743) of the individuals experiencing bowel irregularity indicated they would utilize self-care methods as their initial response whereas 15% would contact a health care professional.

Research indicates that strongly tied consultants (relatives and close friends) are more frequently consulted than health professionals and women are more likely to consult various sources including written material (Lenz, 1984). It was not possible to discern the

strength of ties to the consultants used in this thesis study nor were gender differences examined in relation to type of literature or media-based reference consulted. It is interesting to note that the literature indicates that size of social network will impact upon the extent to which lay consultation exerts influence. Research indicates that while larger social networks are more likely to provide more diverse information they exert a weaker influence than smaller more dense networks (Palo Stoller, 1998). Size of social network was not measured in this thesis study.

A seldomly-discussed method of securing health information is identified by Rudd & Glanz (1990) as an internal search. In other words, memory is used to retrieve information previously learned and applied to a current situation. In this thesis study 40 respondents indicated they used at least one method that was self-taught or self recommended. Because no specific avenue of recommendation other than the self was indicated by the respondents it is difficult to ascertain what percentage of the 40 actually used memory or used "trial and error" to decide upon their method(s) used.

A final factor which was not measured in this study and which certainly could be influential in the decision to contact an MD, another professional or to utilize alternative or culturally based treatments is ethnicity and cultural background. The literature indicates, "Every patient has his or her own unique belief system about illness..." (Hall & Stone, 1998, p. 46). Beliefs, values, lifestyle and problem solving strategies are inextricably linked to one's cultural or ethnic heritage as well as familial influences (Danielson, Hamel-Bissell & Winstead-Fry, 1993; Hunt, 2001; Pender, 1996). Certainly the reasons for not including this factor in this thesis study have been discussed

previously however it must be indicated that this factor may have contributed to the outcome.

### ***Definitions of Normal Bowel Functioning and Constipation***

In order to investigate what older adults' concept of constipation was respondents were asked what they thought the word meant. Additionally respondents were asked to describe the symptoms they believed to be associated with constipation.

The most frequent definitional component of constipation included descriptions of negative symptoms that were related to the actual act of evacuation. Approximately 30% of the sample indicated that hard stools, difficulty passing stools and straining were the cardinal definitional components of constipation. These findings are similar to definitional components used by older adults documented in the literature (De Lillo & Rose, 2000; Harari, Gurwitz, Avorn, Bohn & Minaker, 1997; Shamburek & Farrar, 1990; Whitehead, Drinkwater, Cheskin Heller & Schuster, 1989; Wolfsen, Barker & Mitteness, 1993). It is interesting that only a small number of the respondents also indicated that constipation meant a change in frequency of bowel movements from their normal rate. This finding has been noted in the literature as well-that changes in frequency of stool passage are less often included in older adults' definitions of constipation (Wolfsen et al, 1993). It is important to note that this definitional element is one of the key differences between lay definitions of constipation and the medical definition of constipation. The point where the lay definition and the professional medical definition depart is related to the actual frequency change. In this study respondents indicated that any decrease in frequency constituted constipation whereas the medical definition suggests fewer than three bowel movements per week indicates constipation (Shamburek & Ferrar, 1990;



Whitehead et al. 1989; Wolfsen et al, 1993). This is an obvious discrepancy, which certainly would cause lay and professional definitions to vary widely.

In terms of qualitative descriptions of the effects of constipation on health, social life and life in general the respondents provided a variety of responses. Twenty nine respondents (35.3%) indicated that constipation had a general negative effect on one's life. Discomfort affecting one's whole body both physically and emotionally was common. General descriptors like "uncomfortable" were used as well as energy-focussed descriptors such as "sluggish" were common. The physical discomforts related to "not feeling well" were also implicated in limitations on social contact and social outings. One respondent (# 53) indicated that her friend's social life was limited due to constipation, "...it limits her ability to go out. I can understand that, if you're not feeling good it limits your ability to take part in everything". Psychological descriptions clearly indicated that anxiety, worry and constipation were linked. Worry and anxiety were described as related to the physical environment as well as the potential for embarrassment in a social situation. Concerns relating to the availability and accessibility of washrooms were identified as a source of anxiety negatively impacting on one's social life. Worries that flatus may create an embarrassing situation was also a source of psychological discomfort. Although some researchers (Drossman, 1994; Whitehead, 1994) have proposed a causal link between constipation and psychological issues like anxiety and depression the fact that psychological impacts were identified in this thesis study as effects of constipation is revealing.

A review of the literature revealed few references in the way of descriptive-emotive work related to the biopsychosocial nature of constipation. A study by O'Keefe,

Talley, Zinsmeister and Jacobsen (1995) investigating the relationship between chronic gastrointestinal symptoms and functional status of older adults (N= 530) living independently in the community revealed that subjects experiencing constipation, who visited a physician for evaluation of gastrointestinal complaints in the previous year, had lower median scores on scales measuring social functioning (fewer social contacts with family and friends in the month prior to the study), mental health (greater symptoms of anxiety and depression as well as poorer overall psychological well-being). Similar findings with respect to psychological well-being and constipation have been identified in several other studies (Campbell et al., 1993; Donald et al., 1985; Whitehead et al., 1989; Wolfsen, Barker & Mitteness, 1993). Koch and Hudson (2000) found that study participants described compromised health and general wellness due to constipation.

#### ***Factors Influencing Study Findings and Limiting Generalizability***

There are a number of possible factors, which may have negatively influenced the ability of this thesis study to produce statistically significant results. These include sample size, sample selection, study design and theoretical orientation of the study.

The overall sample size is certainly a likely factor. Originally the study was determined to require a minimum of 130 respondents based upon the number of independent variables being used. Unfortunately the study ended up including only 78 participants. This certainly may have negatively impacted on the ability to discern any significant differences.

The fact that this study utilized a non-probability sampling method for subject recruitment may also have impacted on the findings and certainly limits the generalizability. Due to the non-random method of sample selection it must also be

recognised that the use of inferential statistics was done cautiously as the assumptions of normal data distribution and random selection were not upheld. As such results cannot be generalized beyond the thesis study sample. Furthermore self-selection and self-report are two highly influential factors, which the literature indicates, can negatively effect the outcomes of a study (Mullen et al, 1987). As the respondents were self-selected they would necessarily be more inclined to speak about the topic of constipation. It may be that they were also biased in their reporting as they may have tended to under report behaviours, which they felt, might be perceived as "less than desirable" and may have over reported those behaviours that they perceived to be "more desirable". There was also very little variance in income levels because of the convenience and snowball sampling. Therefore, those of similar income (socio-economic status) may have similar practices. The literature reviewed indicated that income level has been associated with use of certain methods/therapies. Particularly, those of middle to upper income brackets have been found to utilize the more expensive alternative type of methods (Astin, 2000; Hodge & Ullrich, 1999; Johnson, 1999).

A third influence which may have impacted on the ability of this thesis study to generate statistically significant results could be the overall retrospective study design. The retrospective design may have placed the thesis study in jeopardy as the literature indicates that retrospective studies assume that the particular beliefs, attitudes and perceptions are in fact constant (Mikhail, 1981; Rosenstock, 1974; Rundall & Wheeler, 1979). In other words, the beliefs and attitudes of the respondents measured during a study are assumed to be in existence prior to the health behaviour being measured. This assumption, however, may not be a valid one (Mikhail, 1981; Rosenstock, 1974; Rundall

& Wheeler, 1979). As such in this thesis study the beliefs expressed by the respondents, at the time of the interview, may not have actually been the ones impacting upon the original decision to utilize the particular method(s) when respondents first put the method(s) use. Consequently, a lack of significant relationships may be due in part to the actual study design.

A final influence that may have negatively impacted on the outcomes of this thesis study is the overall theoretical orientation. This study, as identified earlier, was based upon the HBM, which incorporates a medical illness approach to self-care. It may be that this was not the most applicable orientation. It may be that this thesis study should rather have utilized a health promotion focus on self-care. Reasons for this conclusion stem from the fact that respondents were functionally advantaged and the majority subjectively described their health to be "good" or "excellent".

It appears the study sample was in fact comprised of rather able-bodied older adults with few functional concerns and a limited number of chronic conditions. Although 95% of the sample indicated they required assistance with at least one IADL it must be noted that the top three IADL concerns were 1) 61% required assistance with long term banking/finances, 2) 42% required assistance with yard work and 3) 60% required help doing stairs with most respondents indicating they use a hand rail for support. 63% of the sample indicated no ADL limitations whatsoever. These findings are comparable to the functional capacity of persons 65 years and over measured in the 1991-1992 Manitoba Study of Health and Aging (Centre on Aging, 1996). In the 1991-1992 Manitoba survey 40.9% of persons aged 65 years and over required assistance with yard work, 32% required assistance doing stairs and 22% required assistance doing long

term finances; while 80% did not require assistance with ADL's (Centre on Aging, 1996). Additionally the sample had an average of 3.6 chronic conditions per person which is lower than the average number of health problems reported by persons aged 65 years and older on the 1991-1992 Manitoba Study of Health and Aging (Centre on Aging, 1996).

In regards to subjective health status or self-rated health, the majority of respondents (64%) indicated that their health was 'good' or 'excellent'. This is similar to the perceived health status of persons 65 years and over measured in the 1991-1992 Manitoba Study of Health and Aging wherein 75% indicated their health was 'very good' or 'pretty good' (Centre on Aging, 1996). Similarly the perceived health status of persons 65 years and over measured in the 1990 Canadian Health Promotion Survey (Elliot, Hunt & Hutchison, 1996) 43% of Canadian males aged 65 years and over described their health as 'very good' or 'excellent' and 44% of Canadian females aged 65 years and over described their health as 'very good' or 'excellent'. In comparison to these findings it is reasonable to assume that this thesis sample was of fairly good health status. As such, the focus of the sample may have been more proactive health promotional perspective. If this were in fact the case then this perspective would not fit well with the HBM, which has a medical illness focus. Rather a model which promotes self-care and proactive self-directed approaches to health, such as the Health Promotion Model (Pender, 1996) may have been more applicable.

### ***Implications for Nursing Practice***

Health promotion, disease prevention and illness management are essential concepts in the Canadian health care system (Beckingham & DuGas, 1993). The essential

tenets of these concepts involve nurses' work. Essentially all nurses work to provide interventions, which include direct care, education, counselling, liaison coordination and advocacy. These activities are necessary in order to assist individuals in meeting their basic needs. In order to realize success it is imperative that nurses undertake assessment and interventions within a framework of respect for client capabilities, limitations and cultural preferences (Beckingham & DuGas, 1993). Partnership with older adults is required in order for success to be realised. Partnership can only be established if nurses take the initiative to understand clients' perspectives regarding health and illness (Pender, 1996). This essentially involves the nurse in the role of "cultural broker" (Hall, Stone & Fiset, 1998). Cultural brokering involves elicitation of key factors that provide the social and personal meaning of health and illness for the individual. The literature indicates that older adults are more likely to incorporate recommendations and advice about health and illness that agrees with their personal definition of health and illness (Beckingham & DuGas, 1993; Danielson, Hamel-Bissell & Winstead-Fry, 1993; Hunt, 2001). As such thorough assessment of the client's beliefs about health and illness, the meaning of health and illness in both personal and social terms as well as the older adult's expectations concerning the course of illness and the expected outcomes of the client-nurse interaction are key elements for the nurse to understand and incorporate into his/her care plan (Hall, Stone & Fiset, 1998). In doing this assessment the nurse will be better equipped to understand the values, beliefs, customs, desires, expectations and capabilities of the older adult which will necessarily impact upon any course of advice or intervention.

In this thesis study the majority of the sample did not use MD's for consultation. Similarly the use of RN's and Pharmacists was minimal. This finding indicates that there

is a greater role to be played by both these professional groups with respect to prevention of constipation and maintenance of normal bowel function in the community.

A large proportion of this thesis study's sample (55.1%) was practicing fairly healthy bowel maintenance and constipation prevention practices. This finding provides positive evidence that older adults are in fact interested and willing to incorporate healthy lifestyle practices into their daily routines. As such nurses need to continue with health promotion teaching.

Linked to a client's health belief system is the way in which older adults seek out and obtain information about health and illness issues as many of them are indeed engaged in self care health activities (Novak, 1993). Research has shown that older adults spend a good deal of their leisure time reading, watching television as well as visiting with family and friends (Novak, 1993). As mass media, both television and printed material, exhibits a considerable influence over health behaviours it is important for the nurse to investigate the source(s) of information older adults are using when they are deciding on a self-care treatment method (Pender, 1996). It is important that nurses evaluate older adults' knowledge about the methods/products they are using and clarify any misleading information that the older adult may assume to be true. Correct information about side effects and potential interactions between treatment modalities is a necessary component of nursing assessment and intervention. This is particularly important in regards to herbal and traditional methods used for prevention of constipation and maintenance of normal bowel function. For example, licorice has known laxative properties and has a long folklore history (about 4000 years) for many illnesses and conditions including constipation. Similarly flax has also been used to treat a variety of

gastrointestinal problems including constipation. What many may not know is that licorice is contraindicated in persons with liver disease, kidney insufficiency, hypokalemia, cardiac problems, hypertension, diabetes and those who are overweight (Boon, 2000; Chandler, 2000). As well flax may delay the absorption of some drugs and it should be used with caution in persons with bleeding disorders as it may increase bleeding times (Boon, 2000; Chandler, 2000).

### ***Implications for Future Research***

Prevention and promotion aspects as they relate to constipation cannot be teased out of the current study data as no specific questions were asked to identify whether the respondents considered their methods to be prevention or treatment focussed. As well, no questions were asked to determine if in fact the respondents considered themselves to be constipated at the time of the interview or not. This may in fact be a key for future research endeavours: to investigate whether one's current biological state with respect to constipation is an influencing factor in the types of methods chosen to maintain normal bowel function and to prevent constipation. Does active constipation result in more aggressive treatment methods?

Another research focus brought out by the current study relates to the definition and measurement of laxative use in the older adult population. As indicated previously, current literature does not provide a consistent classification of bran as either a laxative or a dietary agent. This inconsistency requires further investigation. Does inclusion of bran as a laxative agent rather than a dietary agent in fact inflate the reports of laxative use amongst older adults?



A third opportunity for research related to constipation involves the interrelatedness of psychosocial factors and the use of laxatives. The current study did not examine mood and the presence or absence of depression, anxiety or other psychological states which the literature indicates could be related to the frequency of taking medication, the type of medication and the frequency of health care visits (Drossman, 1994). Investigation into the connection between psychological well-being and the prevention of constipation and the maintenance of bowel regularity is a research opportunity which could provide greater understanding of constipation and how older adults decide to manage their bowels and constipation.

### ***Summary and Conclusion***

In summary this chapter has discussed the major findings of this thesis study and has explored a number of plausible explanations for the findings in light of current literature. Limitations of the study were outlined and recommendations for improvements were outlined as were implications for nursing practice and future research. This study has contributed to an understanding of the limited conceptual clarity and qualitative information available to nurses regarding prevention of constipation and maintenance of normal bowel function in older adults. It is clear that further exploratory research is warranted.

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**Appendix B**

**University of Manitoba Education/Nursing Research Ethics Board Approval**



UNIVERSITY  
OF MANITOBA

Office of the President

Office of Research Services  
244 Engineering Building  
Winnipeg, MB R3T 5V6  
Canada  
Telephone (204) 474-8418  
Fax (204) 261-0325

### APPROVAL CERTIFICATE

30 November 2001

**TO:** **Kimberly Wiebe**  
Principal Investigator (Advisor P. Hawranik)

**FROM:** **Lorna Guse, Chair**  
Education/Nursing Research Ethics Board (ENREB)

**Re:** **Protocol #E2001:094**  
**"Factors Associated with Prevention of Constipation and  
Maintenance of Normal Bowel Functioning in Community Dwelling  
Older Adults"**

---

Please be advised that your above-referenced protocol has received human ethics approval by the **Education/Nursing Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement. This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

**Appendix C**

**Winnipeg Regional Health Authority Approval**



Winnipeg Regional  
Health Authority

Office régional de la  
santé de Winnipeg

1800-155 Carlton St.  
Winnipeg, Manitoba  
R3C 4Y1 CANADA

TEL: 204 / 926.7000  
FAX: 204 / 926.7007  
www.wrha.mb.ca

155, rue Carlton, suite 1800  
Winnipeg, Manitoba  
R3C 4Y1 CANADA

TÉLÉ: 204 / 926.7000  
TÉLÉC: 204 / 926.7007  
www.wrha.mb.ca

February 28, 2002

Ms. Kimberly A. Wiebe

Dear Ms. Wiebe:

**Re: Proposal "Factors Associated with Prevention of Constipation & Maintenance of Normal Bowel Functioning in Community Dwelling Older Adults"**

We are pleased to inform you that your research access request for the above named study has been approved by the Winnipeg Regional Health Authority (WRHA). You may proceed with your study once the following conditions are met or agreed to:

- You, your co-investigators, and your research assistants comply with the WRHA Personal Health Information Act (PHIA) and Freedom of Information and Protection of Privacy Act (FIPPA) Policies, which includes reviewing, signing and returning the enclosed Pledge of Confidentiality;
- You agree not to report or publish personal health information in a form that could reasonably be expected to identify the individuals concerned;
- You agree to use any personal health information solely for the purposes of the approved research project;
- You ensure that you have safeguards to protect the confidentiality and security of any personal health information, including procedures for removing identifying information, and plans to destroy your data at the earliest opportunity and in accordance with the purposes of the project;
- You submit to our attention any significant changes in your proposal prior to implementation or any significant changes during the course of the study;
- You inform us when your data collection is complete;
- You submit a summary of the final results of the study to the WRHA and provide us with a copy of any publications arising from the study;
- You agree to submit any article or report that names the WRHA for review prior to submitting for publication;
- You sign this letter on the line indicated below and on the copy, and return one of the signed letters to the Chair/Acting Chair, Research Review Committee.

Thank you for selecting the Winnipeg Regional Health Authority as the site for recruiting participants for your study. Please let us know should you encounter any site-related difficulties during the course of your study.

We extend best wishes for successful completion of your study.

Sincerely,

Val Austen-Wiebe  
Acting Director, Community Health Assessment  
Acting Chair, Research Review Committee  
Ph. (204) 926-8036

---

I agree to the conditions as stipulated in this letter:

\_\_\_\_\_  
(Signature of Principal Investigator)

March 12/02  
(Date)

---

cc. Dr. B. Postl

Encl: Confidentiality Policy and Pledge

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### **Appendix D Recruitment Script**

Kimberly Wiebe is a Registered Nurse who works with older adults in the city of Winnipeg. Ms. Wiebe is also a student at the University of Manitoba in the master's program of the Faculty of Nursing. Ms. Wiebe is conducting a research study investigating the problem of constipation and what methods older adults use to treat and prevent it.

Ms. Wiebe is interested in interviewing seniors about this. Are you interested in talking to her about participating in the study? If you are do I have your permission to give her your name and phone number?

NOTE: If the person is not interested they need to be thanked for their time and consideration of the matter.

## Appendix E

### Factors associated with prevention of constipation and maintenance of Normal Bowel Functioning in Community Dwelling Older Adults Study Participation Information for Respondents

You are invited to participate in the research study concerning constipation being conducted by myself, Ms. Kimberly Wiebe. I am a nurse who works with older adults in the community and I am a graduate student in the Faculty of Nursing at the University of Manitoba. I am exploring the problem of constipation and what methods older adults use to prevent it and to maintain normal bowel function.

There are no direct benefits to you for your participation in this study. However, it is expected that the shared information of people like yourself will help to further educate and inform people who work in the health field with older adults, particularly nurses.

The interview will be about an hour in length and involves answering a questionnaire. The costs to you involve your time spent answering my questions.

You are under no obligation to participate. If you decide not to participate this will have no effect on the health care services you currently receive or will receive in the future.

This study has been approved by the Research Ethics Board of the Faculty of Nursing at the University of Manitoba and the Research Review Committee of the Winnipeg Regional Health Authority. This study will be conducted in compliance with the Personal Health Information Act of Manitoba. All information provided is confidential. All information will be stored in a locked box and will be kept for a period of seven years after which time it will be destroyed.

At no time will it be possible for individual study respondents to be identified in any of the written or oral reports that are produced from this study. Any details which could possibly identify individual respondents will be excluded. All survey questionnaires will be identified with a coded identification number. No names or addresses will be used. Only myself, my thesis committee chairperson (Dr. Pamela Hawranik) and a statistician will have access to the completed questionnaires.

## **Appendix F Consent Form**

You are invited to participate in the research study "Factors associated with Prevention of Constipation and Maintenance of Normal Bowel Functioning in Community Dwelling Older Adults" being conducted by Ms. Kimberly Wiebe, RN BN. Ms. Wiebe is a nurse who works with older adults in the community and is also a graduate student in the Faculty of Nursing at the University of Manitoba. Ms Wiebe is exploring the problem of constipation and what methods older adults use to prevent it and to maintain normal bowel function. This study has received ethical approval from the Faculty of Nursing Research Ethics Board at the University of Manitoba. It has also received access approval from the Research Review Committee of the Winnipeg Regional Health Authority and the pastoral team of the Fort Garry Mennonite Brethren Church.

This study will be conducted in compliance with the Personal Health Information Act of Manitoba. All information provided is confidential. All information will be stored in a locked box and will be kept for a period of seven years after which time it will be destroyed.

At no time will it be possible for individual study respondents to be identified in any of the written or oral reports that are produced from this study. Any details which could possibly identify individual respondents will be excluded. All survey questionnaires will be identified with a coded identification number. No names or addresses will be used. Only Ms. Wiebe, her advisor/thesis committee chairperson, Dr. Pamela Hawranik and a statistician will have access to the completed survey questionnaires.

There are no direct benefits to you for your participation in this study. However, it is expected that the shared information of people like yourself will help to further educate and inform those who work in the health field with older adults, particularly nurses.

The interview will be about an hour in length and involves answering a questionnaire. The costs to you involve your time spent answering questions.

You are under no obligation to participate in this study and your participation is completely voluntary. You may withdraw from the study at any time. You are free to not answer certain questions if you so choose. If you decide not to participate in this study this will have no effect on the health care services you currently receive or will receive in the future.

If you have any questions about the study, you may ask them at any time during the interview or you may call Ms. Wiebe or her advisor at the Faculty of Nursing at the numbers listed below. You will be given a copy of this consent form. If you wish, a summary of the study findings will be made available to you once the study is completed.

Your signature below indicates that you agree to participate and that you understand the previous details about your involvement in the study.

The importance of your participation is fully recognized and gratefully acknowledged. Thank-you.

Study Respondent Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I have provided a thorough verbal and written explanation of the research study and content of this consent form to the above study respondent:

Researcher Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Kimberly Wiebe, R.N., B.N.  
Graduate Student  
Faculty of Nursing  
University of Manitoba  
736-4731

Pamela Hawranik, R.N., PhD.  
Advisor/Thesis Chairperson  
Faculty of Nursing  
University of Manitoba  
474-6716

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\_\_\_\_\_  
(collected if respondent requests a summary of study results)

## Appendix G

### Bowel Care Recipes

#### Recipe #1

##### “Power Pudding”

½ cup prune juice (if needed to blend only)

½ cup applesauce

½ cup wheat bran flakes

½ cup whipped topping (eg. Cool Whip)

½ cup prunes (canned stwed prunes)

(Note: Diabetics may use “no added usges” applesauce and “light” whipped topping).

Blend ingredients, cover and refrigerate. May be kept as long as one week.

Take ¼ cup portions of recipe with breakfast.

(Neal, L. J. (1995). “Power pudding”: natural laxative therapy for the elderly whoa re homebound”. *Home Healthcare Nurse*, 13 (3), 68).

#### Recipe #2

##### “Fiber Supplement”

2 cups Kellog’s All-Bran cereal

2 cups applesauce

1 cup 100% prune juice

(Brown, M. K. & Everett, I. (1990). Gentler Bowel Fitness with Fiber. *Geriatric Nursing*, January-February, 26.)

### Recipe #3

#### Natural Laxative Mixture

2 lbs. raisins

2 lbs. currants

2 lbs. prunes

2 lbs figs

2 lbs. dates

2 – 28 oz. Containers of undiluted prune concentrate

Put fruit through a grinder/mixer. Mix with prune concentrate in larger mixer (mixture will be very thick). Store in large-mouthed plastic container. Refrigerate.

(Note: any dried fruit can be added.)

Beverley, L. & Travis, I. (1992). Constipation Proposed Natural Laxative Mixtures. *Journal of Gerontological Nursing, October, 8.*

**Appendix H**  
**Questionnaire for Study on Factors**  
**Associated with Prevention of Constipation & Maintenance of Normal Bowel**  
**Functioning in Community Dwelling Older Adults**

ID # \_\_\_\_\_

Date of interview (DD/MM/YY) \_\_\_\_\_ Time Interview Began \_\_\_\_\_

Time Interview Finished \_\_\_\_\_

Contact source

- 00 Poster
- 01 Presentation
- 02 SHRT
- 03 Pastoral team
- 04 Personal contact
- 05 Other \_\_\_\_\_

Location of interview

DWELLING

- 00 single family dwelling
- 01 apartment/condo
- 02 guest home/boarding home/ hostel
- 03 Seniors dwelling only
- 04 other \_\_\_\_\_

AREA OF CITY

Postal code \_\_\_\_\_

Investigator: *I would like to begin this (AFTERNOON< MORNING< EVENING) by thanking you so much for agreeing to meet with me. I have quite a few questions to ask you which should take us about an hour or so.*

*As you know I am here because I am doing this research study as part of the requirement to complete my Master of Nursing degree. My area of study pertains to older adults. I am particularly interested in the problem of constipation and what people do to treat it and prevent it.*

*I will be asking you a number of different questions today some of which are directly related to constipation while others are more concerned with general health and function.*

*I will begin with asking some questions concerning your history. Please remember that anything you tell me is strictly confidential. Do you have any questions before we begin?*





- |   | Zero | One | Two | 3-4 | 5-8 | 9+ |
|---|------|-----|-----|-----|-----|----|
| 6.* How many relatives do you see or hear from at least once a month?   | 0    | 1   | 2   | 3   | 4   | 5  |
| 7.* How many relatives do you feel close to? That is, how many of them do you feel at ease with, can talk to about private matters or can call on for help? | 0    | 1   | 2   | 3   | 4   | 5  |
| 8.* Do you have any close friends? That is, do you have any friends with whom you feel at ease, can talk to about private matters or can call on for help?  | 0    | 1   | 2   | 3   | 4   | 5  |
| 9.* Tell me about the friend with whom you have the most contact. How often do you see or hear from that person?  | 0    | 1   | 2   | 3   | 4   | 5  |

*For the next several questions I'd like you to choose your response from these options. (Hand respondent card with response options printed on it.)*

<monthly   monthly   few x/month   weekly   few x/wk   daily

- |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 10.* Tell me about the relative with whom you have the most contact. How often do you see or hear from that person? | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|

<monthly   monthly   few x/month   weekly   few x/wk   daily

- |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 11.* Tell me about the friend with whom you have the most contact. How often do you see or hear from that person? | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|

***For the next several questions I'd like you to choose a response from the ones printed on this card. (Hand respondent card with response options printed on it.)***

Always    Very often    often    sometimes    seldom    never

12.\* When you have an important decision to make, do you have someone you can talk to about it?

5            4            3            2            1            0

13.\* When other people you know have an important decision to make, do they talk to you about it?

5            4            3            2            1            0

14.\* Does anybody rely on you to do something for them each day? For example: shopping, cooking dinner, doing repairs, cleaning house, providing childcare, etc.

No (go on to question 15)

Yes – score 5 (then skip to question 16).

15.\* Do you help anybody with things like shopping, filling out forms, doing repairs, providing childcare etc.?

4            3            2            1            0

16.\* Do you live here alone or with other people? (Note: Includes in-laws with relatives).

- 05    Live with spouse
- 04    Live with other relatives or friends
- 01    Live with other unrelated individuals (eg. paid help)
- 00    Live alone

TOTAL LSNS (sum of \* questions ) \_\_\_\_\_

***I now have one question concerning your financial situation. Please remember that the information you provide to me is completely confidential. It is important for me to get an idea about the income of the people I am speaking with. The information will be used statistically so that I can get an overall idea of the income of the entire group of people I speak with. No one will be able to identify the income of any specific person I interview.***

17. *I have a card here with a number of different income categories printed on it. Please indicate which category number best describes your current income level.*

01	< \$9,999
02	\$ 10,000 - \$ 20,999
03	\$21,000 - \$30,999
04	\$ 31,000 - \$40,999
05	\$41,000 - \$50,999
06	>\$60,000
88	DK
99	NR

*I would now like to move on to some questions about your health in general.*

*(Hand respondent card with question and response options printed on it.)*

18. **For your age, in general, would you say your health is:**

00	Poor/bad
01	Fair
02	Good
03	Excellent

*Now I would like to ask you a few questions about activities of daily living. The questions will deal with things that we all do everyday as part of our daily lives. I would like to know if, today, you can do these activities without any help, or if you require some help to do them, or if you cannot do them at all. Please tell me about your situation today when answering these questions.*

*(Show cue card with response options written on it).*

*I would like you to choose a response for each question from these options on this card.*

19.

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
A). Can you eat	1	2	3	4	5
B). Can you dress & Undress yourself	1 (pick out clothes, dress & undress)	2 (zipper pulls, extenders, long shoe horn)	3	4	5
BB). Can you button a sweater?	No = 2 Yes, with some help = 1 Yes, with no help = 0				
C). Can you take care of your own appearance eg. comb your hair, (shave for men)	1	2	3	4	5
D). Can you walk 5	1 (except a cane)	2 (walker, crutches, or chair)	3	4	

**IF ANSWER WITHOUT ANY HELP OR WITH SOME HELP ask DD).**

DD). How far can you walk out of doors? (assisted or unassisted)

1= 1 mile or more

7= Does not do

2= ¼ mile

8= DK

3= 100 yards

4= 10 yards

5= less than 10 yards

	Without any Help	With some help from a device only	With some help from a person only	With some help from both a person & a device	Unable to do it
E). Can you get about the house	1	2 (walker, crutches, or a chair)	3	4	5
F). Can you go up and down stairs	1	2 (handrails, walker, chairlift)	3	4	5
G). Can you get in and out of bed	1	2 (any type of lift)	3	4	5
H). Can you take a shower or bath	1	2 (shower seat, hand held shower)	3	4	5
I). Can you go to the bathroom or a commode	1	2 (raised toilet seat, walker)	3	4	5
J). Can you use the telephone	1  (look up numbers & dial)	2  (hearing device, special phone, can dial operator in emergency)	3  (help getting numbers, dialing can dial operator in emergency)	4	5
K). Can you get to places out of walking distance	1 (can travel alone on bus, taxi; drives car)	2 (motorized scooter)	3 (need someone to go with you)	4 (Handi-transit)	5 (need special arrange- ments)

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
L). Can you go out of doors in good weather	1	2	3	4	5
M). Can you go out of doors in any weather	1	2	3	4	5
N). Can you go shopping for your groceries or clothes (assuming they have transportation)	1 (take care of all shopping)	2	3 (need someone to go with you on all trips)	4	5
O). Can you prepare You own meals	1 (plan & cook full meals)	2	3 (not full meals)	4	5
P). Can you do your own heavy house- work (eg. scrub floors, vacuum, windows & walls)	1 (scrub floors etc.)	2	3 (can do light but not heavy work)	4	5
Q). Can you do light housework (dusting, dishes, etc.)	1	2	3	4	5
R). Can you do yardwork &/or gardening	1	2	3	4	5

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
S). Can you take your own medicine	1 (in the right doses @ right time)	2 (pill counter)	3 (someone prepares it & reminds you to take it)	4	5
T). Can you care for your feet and cut your toenails	1	2	3	4	5
U). Can you handle your own money (this question refers to day-to-day handling)	1 (write checks, pay bills, etc.)	2	3 (can manage day- to-day buying but need help with check book & paying bills)	4	5
V). Can you handle planning your long term finances (eg. Investments, Banking)	1	2	3	4	5

***Thank you for that information.***

*Now I am going to move onto some questions which are more specific to your health and health concerns.*

*I am going to read a list of health concerns which people sometimes experience.*

**20. Can you tell me if you have had any of the following problems within the last year or if you are still having after effects from having had them earlier?**

**Heart Problem** \_\_\_\_\_

**Stroke** \_\_\_\_\_

**Arthritis or Rheumatism** \_\_\_\_\_

**Palsy (Parkinsons)** \_\_\_\_\_

**Eye trouble** \_\_\_\_\_

**Ear trouble** \_\_\_\_\_

**Dental problems** \_\_\_\_\_

**Chest problems** \_\_\_\_\_

**Stomach trouble** \_\_\_\_\_

**Kidney trouble** \_\_\_\_\_

**Diabetes** \_\_\_\_\_

**Foot trouble** \_\_\_\_\_

**Nerve trouble** \_\_\_\_\_

**Skin problems** \_\_\_\_\_

**Other (specify)** \_\_\_\_\_

**Overall Health Status** \_\_\_\_\_  
(total of all health conditions)

*Thank you for that information.*

*I would now like to move ahead to some questions specifically about constipation and maintaining your bowel function.*

**21. How have your bowels have been over the years?**

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**22. Please tell me in your own words what you consider "normal bowel functioning" to be.**

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**23. What does "regular" (with respect to bowels) mean to you?**

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**24. What would cause you to think your bowels were not functioning "normally"?**

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**25. If you were to say you were constipated what would this mean?**

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**26. What would cause you to think you were constipated? What symptoms do you have (would you have) if/when you are/were constipated?**

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**27. Do you think constipation affects a person's health, their social life, their life in general? How so?**

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*I will now ask you some questions about preventing constipation and keeping/maintaining normal bowel function.*

**28. Please tell me what strategies, that is, what things you do, to keep your bowels working normally and to prevent constipation. (Probes: Do you take any medicines or use any remedies to help keep your bowels working/to keep your bowels regular? Do you eat any particular foods to help with your bowels?) (RECORD ON CHART)**

*Once respondent has completed listing all methods/strategies say "I am going to review the list of methods just to make sure I have the list correct". After each method ask question 29 & 30.*

**29. Is this something your doctor recommended or prescribed?**

**30. Who recommended this method to you?**

**31. Is there anything else you would like to add to this list before we move on?**

**32. Please think about your bowel regimen habits over the past month. Please choose a response option from this card which best describes how often you used each of these methods in the last month.**

(Code table)

**33. For each method I would now like you to think about how long you have been using each method. (eg. bran daily for the past 5 years). Please tell me the length of time you have been using each method. (Code table)**

CODES:

MD Rx

Yes=0, No=1

Non-MD Rx Friend (00); Family (01); Alternative Care provider (02) Specify; RN (03); Pharmacist (04); OT (05); PT(06); Other (07) Specify

Frequency in last month: never (00); <once/wk (01); 1-2 times/wk (02); Alternate days (03); Daily (04)

Duration of Use: a) less than 6 months (00),

b) 6 months to 1 year (01), c) 1 to 5 years (02), d) 6 to 10 years (03), e) more than 10 years (04)



**34. Would you say that you are more likely than others to become constipated, about as likely as others to become constipated or less likely than others to become constipated?**

*(SHOW CUE CARD WITH RESPONSE OPTIONS)*

0= less likely

1= About as likely

2= More likely

**35. I'm going to show you a 10 point scale. I would like you to point to the number on the scale which most accurately represents how severe the harm would be if you became constipated. Zero represents "no harm at all" and Ten represents "extreme harm"**

SEVERITY RATING \_\_\_\_\_ (actual number)

*Thank you. We're almost done.*

*With these last sets of questions I am interested in learning about people's opinions regarding health and illness in general.*

*Please indicate how strongly you agree or disagree with the following statements. Please choose an answer option from those printed on this card. (Hand cue card to respondent).*

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
<b>36.</b> If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
<b>37.</b> No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
<b>38.</b> Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
<b>39.</b> Most things that affect my health happen to me by accident.	1	2	3	4	5	6

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
40. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
41. I am in control of my health.	1	2	3	4	5	6
42. My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
43. When I get sick I am to blame.	1	2	3	4	5	6
44. Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
45. Health professionals control my health.	1	2	3	4	5	6
46. My good health is largely a matter of good fortune.	1	2	3	4	5	6
47. The main thing which affects my health is what I myself do.	1	2	3	4	5	6
48. If I take care of myself, I can avoid illness.	1	2	3	4	5	6
49.. When I recover from an illness, its usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
50. No matter what I do, I'm likely to get sick	1	2	3	4	5	6

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
51. If it's meant to be, I will stay healthy.	1	2	3	4	5	6
52. If I take the right actions, I can stay healthy	1	2	3	4	5	6
53. Regarding my health. I can only do what my Doctor tells me to do.	1	2	3	4	5	6

IHLC Total (sum of 36, 41, 43, 47, 48, 52) \_\_\_\_\_

PHLC Total (sum of 38, 40, 42, 45, 49, 53) \_\_\_\_\_

CHLC Total (cum of 37, 39, 44, 46, 50, 51) \_\_\_\_\_

***There are only 6 more questions and then we will be finished. Thank you for your patience and cooperation.***

***For this last section I am going to read 6 statements to you. After each statement, please indicate to me your level of agreement or disagreement with the statement. Please choose a response from the options listed on this card.***

	SD	D	Neither A/D	A	SA
54. I have my doubts about some things doctors say they can do for you.	1	2	3	4	5
55. Doctors often tell you there's nothing wrong with you when you know there is.	1	2	3	4	5
56. I believe in trying out different doctors to find out which one I think will give me the best care.	1	2	3	4	5

	SD	D	Neither A/D	A	SA
57. If you wait long enough, you can get over most sicknesses without going to a doctor.	1	2	3	4	5
58. Some home remedies are still better than prescribed drugs for curing sickness.	1	2	3	4	5
59. A person understands his/her own state of health better than most doctors.	1	2	3	4	5

Skepticism re: what doctors say total score (sum of 54, 55, 56) \_\_\_\_\_

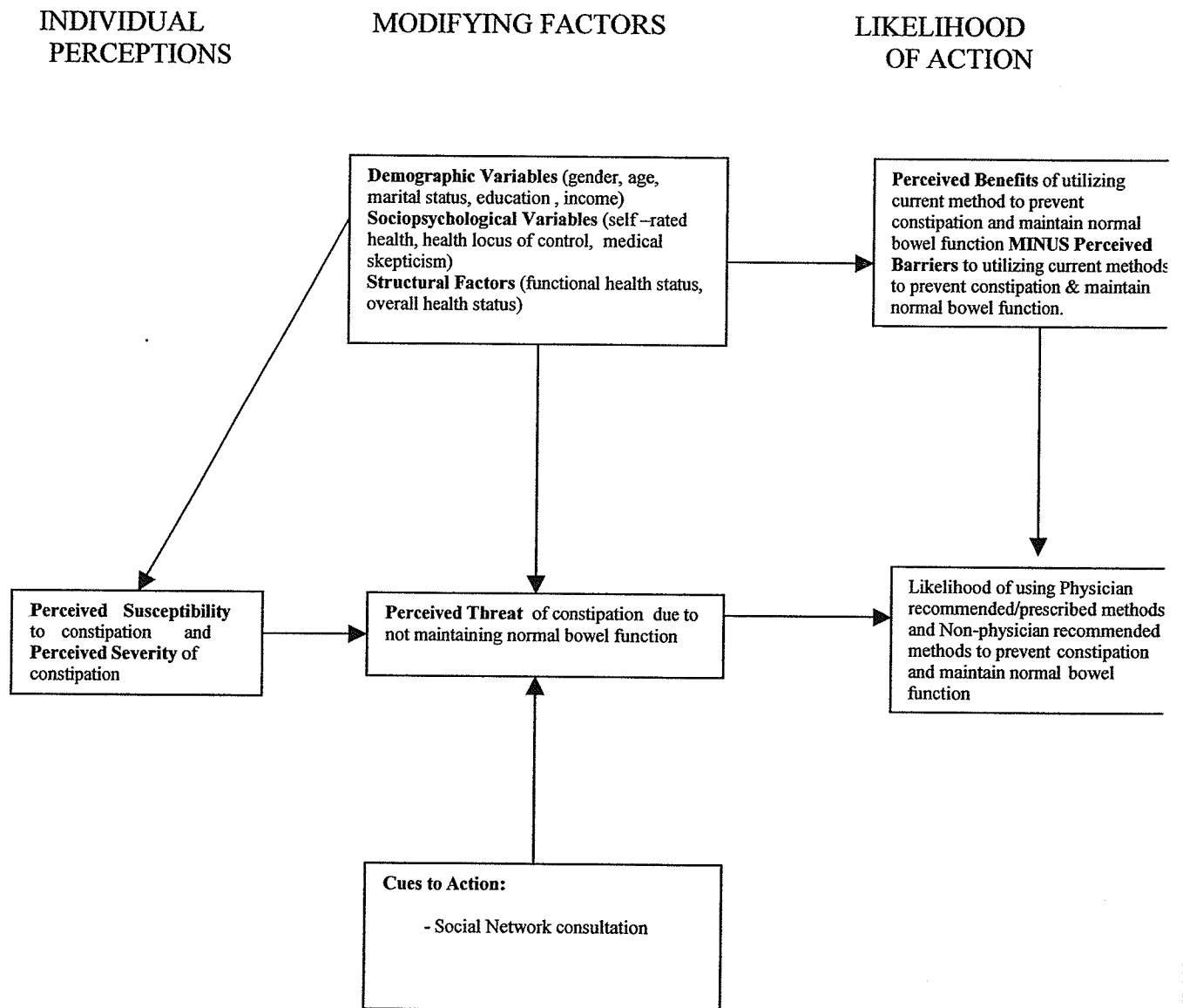
Skepticism re: what doctors do total score (sum of 57, 58, 59) \_\_\_\_\_

***That is all the questions I have. Thank you for your patience and cooperation in answering all of them. I sincerely appreciate your time and participation in my study.***

***Do you have any questions of me before I leave?***

**Appendix I**

**The Health Belief Model & Methods to Prevent Constipation and Maintain Normal Bowel Function**



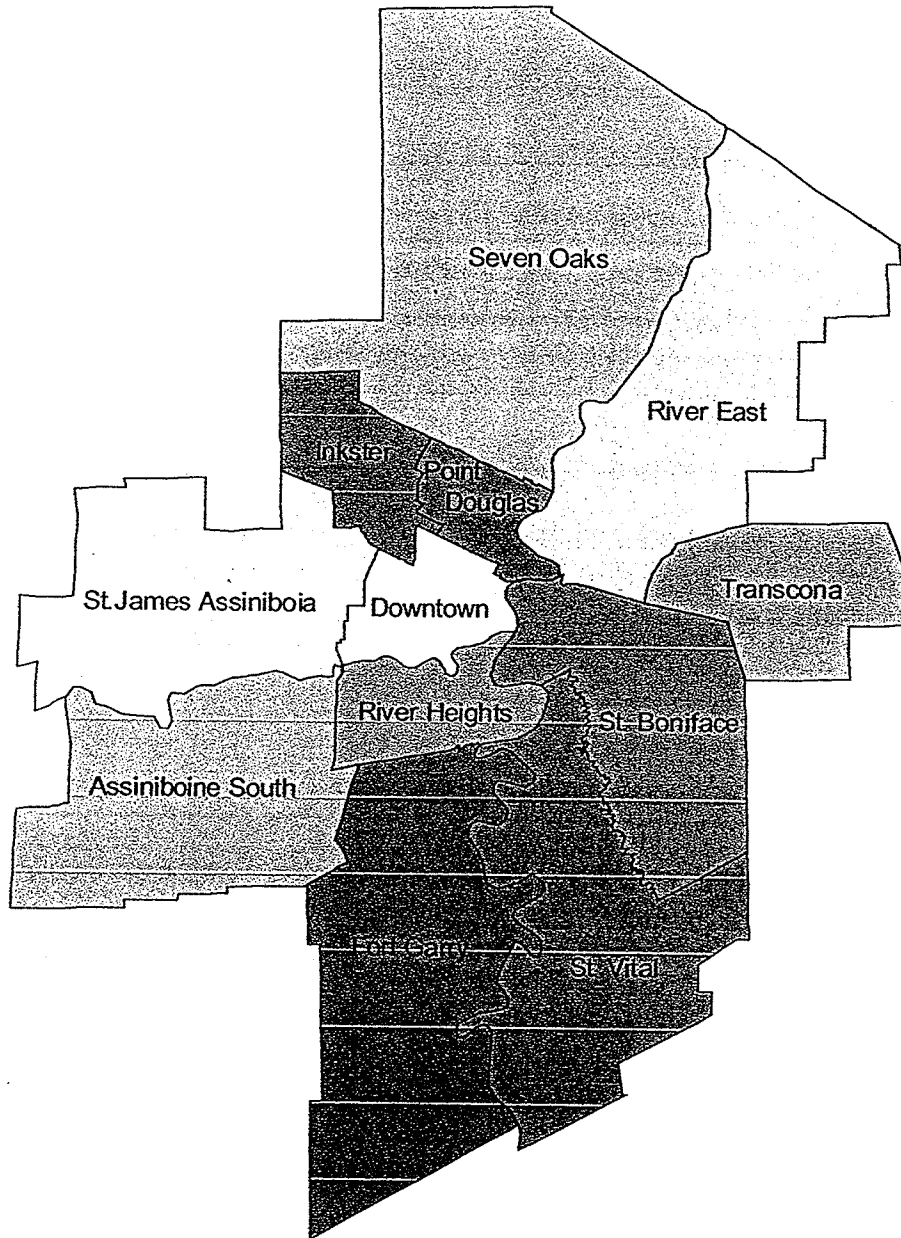
(K. Wiebe, 2001)



**Appendix J**

**Winnipeg Health Region Community Areas**

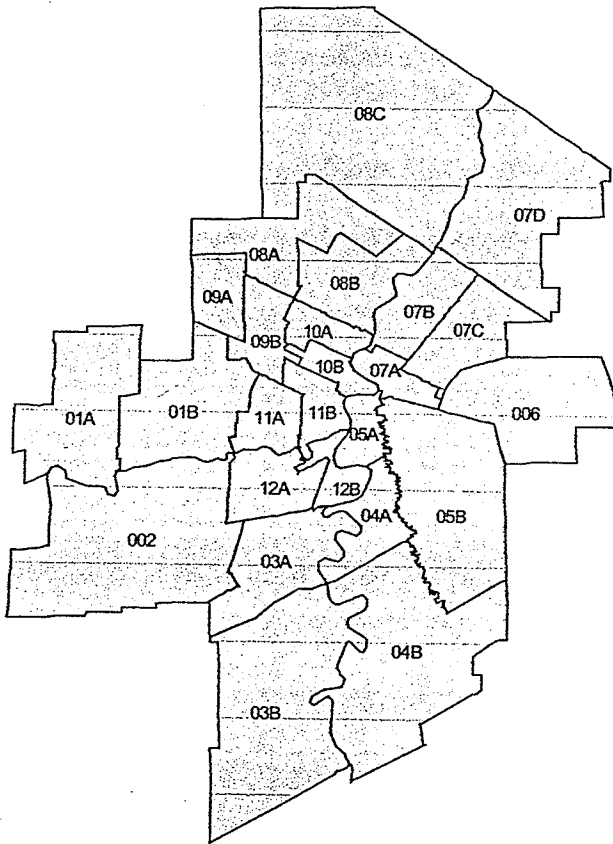
# Winnipeg Health Region: Community Areas



**Appendix K**

**Winnipeg Health Region Neighborhood Clusters**

## Winnipeg Health Region: Neighbourhood Clusters.



### Neighbourhood Clusters

1A	St. James - Assiniboia West
1B	St. James - Assiniboia East
2	Assiniboine South
3A	Fort Garry North
3B	Fort Garry South
4A	St. Vital North
4B	St. Vital South
5A	St. Boniface West
5B	St. Boniface East
6	Transcona
7A	River East South
7B	River East West
7C	River East East
7D	River East North
8A	Seven Oaks West
8B	Seven Oaks East
8C	Seven Oaks North
9A	Inkster West
9B	Inkster East
10A	Point Douglas North
10B	Point Douglas South
11A	Downtown West
11B	Downtown East
12A	River Heights West
12B	River Heights East

**Appendix L**

**Letter of Agreement for use of  
Community Data Network Postal Code Conversion File**



Winnipeg Regional Health Authority

Office régional de la santé de Winnipeg

1800—155 Carlton St  
Winnipeg, Manitoba  
R3C 4Y1 CANADA  
TEL: 204| 926.7000  
FAX: 204| 926.7007  
www.wrha.mb.ca

155, rue Carlton, suite 1800  
Winnipeg (Manitoba)  
R3C 4Y1 CANADA  
TÉL: 204| 926.7000  
TÉLÉC: 204| 926.7007  
www.wrha.mb.ca

## LETTER OF AGREEMENT

Re: (1) Community Data Network Postal Code Conversion File  
and  
(2) Community Data Network Base Maps

To: KIMBERLY A. WIEBE (name)  
MASTER OF NURSING STUDENT  
FACULTY OF NURSING  
UNIVERSITY OF MANITOBA (organization)

As you are aware, the Community Data Network Postal Code Conversion File and the Community Data Network Base Maps for the geographic area of Manitoba were created as a result of a collaborative endeavour of the City of Winnipeg, Social Planning Council, Manitoba Health, Medical Services Branch, the Community Health Assessment (CHA) Unit of the Winnipeg Regional Health Authority (WRHA) and several community partners. The conversion file and base maps will be jointly maintained by the same organizations and distributed by the Community Health Assessment Unit, Winnipeg Regional Health Authority.

The purpose of creating a conversion file and base maps was to reach a consensus on a common set of boundaries when analyzing information. This ensures that a common set of boundaries is used consistently in the tracking of information over a period of time.

These products were created by the Community Data Network as part of developing a collaborative approach for using health and social data. Use of this conversion file and base maps requires a reference quoting the source as the Community Data Network Postal Code Conversion File, Community Data Network, January 2000 or Community Data Network Base Maps, Community Data Network, January 2000, as found in the creation field on the file.

This process creates a common set of geographies which ensures consistency in how information is tracked by geographic areas. Please report any errors or omissions to the Community Health Assessment Unit, Winnipeg Regional Health Authority.

There is no cost for obtaining the conversion file and the base maps however, a signed acknowledgement of these terms must be provided to the Community Health Assessment Unit of the Winnipeg Regional Health Authority before the file will be released. As a registered user you will receive annual updates of the conversion file and base maps.

Two products are included: (1) Community Data Network Postal Code Conversion File: This conversion file represents our best attempt of mapping postal codes to neighbourhoods and other geographical boundaries; and (2) Community Data Network Base Maps: Base maps are provided for neighbourhoods, neighbourhood resource networks, and community areas in the Winnipeg Health

Region and for the Regional Health Authorities. The Winnipeg Regional Health Authority assumes no liability whatsoever for any errors that may occur in either the Community Data Network Postal Code Conversion File and Community Data Network Base Maps; or the use of the Community Data Network Postal Code Conversion File and Community Data Network Base Maps. You assume all risks associated with your use of this file.

You agree not to use this Community Data Network Postal Code Conversion File and Community Data Network Base Maps for revenue generation purposes. Revenue generation is defined as any situation in which a set of identified deliverables and services are exchanged for payment. Undertaking research funded by a **public or charitable competitive granting agency** is not considered to be revenue generation. Undertaking research funded by a private corporation (i.e. a drug company) is considered to be revenue generation. If your organization will be hiring a third party contractor or organization to undertake research or analysis which utilizes these data products, please have the contractor sign the attached "Third Party Contractor Agreement".

Access will be provided to you upon receipt of the following:

1. Your signed consent of this letter
2. A blank 3.5" formatted diskette
3. A self-addressed and stamped envelope for the disk

to the Acting Chair, Community Data Network/Acting Director, Community Health Assessment, Population Health Unit, Winnipeg Region Health Authority, 155 Carlton Street, Suite 1800, Winnipeg, MB R3C 4Y1.

Val Austen-Wiebe  
Acting Director, Community Health Assessment  
Population Health Unit  
Winnipeg Regional Health Authority

Attachment

.....

I accept the terms and conditions specified in this letter.

Signature: \_\_\_\_\_

Name: KIMBERLY A. WIEBE

Title: MASTER OF NURSING STUDENT

Organization: FACULTY OF NURSING, UNIVERSITY OF MANITOBA

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

Dated this 14 day of Nov. 2001.

**Appendix M**

**Socioeconomic Factor Index (SEFI) Value Listing**



SEFI calculated at NRN level (in Wpg) and RM level (Non-Wpg), then standardized			
	SEFI		
Fort Garry	-0.62	Fort Garry S (3B)	-0.53
Assin. South	-0.76	Fort Garry N (3A)	-0.75
St. Vital	-0.30		
St. Boniface	-0.18	Assiniboine S (2)	-0.76
River Heights	-0.17		
Seven Oaks	-0.11	St. Vital South (4B)	-0.55
St. J - Assin.	-0.19	St. Vital North (4A)	0.00
River East	-0.01		
Transcona	-0.31	St. Boniface E (5B)	-0.51
Inkster	0.29	St. Boniface W (5A)	0.44
Downtown	1.06		
Point Douglas	1.41	River Hghts W (12A)	-0.47
		River Hghts E (12B)	0.34
Winnipeg	0.02		
Brandon	-0.13	Seven Oaks W (8A)	-0.17
Rural	-0.02	Seven Oaks N (8C)	-0.53
Manitoba	0.00	Seven Oaks E (8B)	-0.03
		St J - Assin. W (1A)	-0.23
		St J - Assin. E (1B)	-0.13
		River East N (7D)	-0.97
		River East E (7C)	-0.12
		River East W (7B)	-0.15
		River East S (7A)	0.81
		Transcona (6)	-0.31
		Inkster West (9A)	-0.41
		Inkster East (9B)	1.21
		Downtown W (11A)	0.39
		Downtown E (11B)	1.81
		Pt Douglas N (10A)	0.81
		Pt Douglas S (10B)	2.53
		Winnipeg	0.02

**Appendix N**  
**Multidimensional Health Locus of Control**  
**(MHLOC) Scales**

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. If I get sick, it is my own behaviour which determines how soon I get well again.	1	2	3	4	5	6
2. No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3. Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4. Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6. I am in control of my health.	1	2	3	4	5	6
7. My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8. When I get sick I am to blame.	1	2	3	4	5	6
9. Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10. Health professionals control my health.	1	2	3	4	5	6

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree	
11. My good health is largely a matter of good fortune.	1	2	3	4	5	6	
12. The main thing which affects my health is what I myself do.	1	2	3	4	5	6	
13. If I take care of myself, I can avoid illness.	1	2	3	4	5	6	
14. When I recover from an illness, its usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.		1	2	3	4	5	6
15. No matter what I do, I'm likely to get sick		1	2	3	4	5	6
16. If it's meant to be, I will stay healthy.		1	2	3	4	5	6
17. If I take the right actions, I can stay healthy		1	2	3	4	5	6
18. Regarding my health. I can only do what my Doctor tells me to do.		1	2	3	4	5	6

(Wallston, Strudier Wallston & DeVellis, 1978, p. 164).

**SCORING:** Each scale is scored separately. Scores range from a maximum of 36 (indicating a high sense control for a particular dimension) to a low of 6 (indicating a low sense of control in that particular dimension). Question numbers 1, 6, 8, 12, 13, and 17 comprise Form A of the Internal Health Locus of Control Scale (IHLC). Question numbers 3, 5, 7, 10, 14, and 18 comprise Form A of the Powerful Others Health Locus of Control Scale (PHLC). Question numbers 2, 4, 9, 11, 15 and 16 comprise Form A of the Chance health Locus of Control Scale (CHLC).

**Appendix O**  
**Manitoba Study on Health and Aging**  
**(MSHA)-2 Questions**

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
A). Can you eat	1	2	3	4	5
B). Can you dress & Undress yourself	1 (pick out clothes, dress & undress)	2 (zipper pulls, extenders, long shoe horn)	3	4	5
BB). Can you button a sweater?	No = 2 (0) Yes, with some help = 1 Yes, with no help = 0 (2)				

(NOTE: Original scoring for this question identified in italicized print.)

C). Can you take care of your own appearance eg. comb your hair, (shave for men)	1	2	3	4	5
D). Can you walk	1	2 (except a cane)	3 (walker, crutches, or chair)	4	5

IF ANSWER WITHOUT ANY HELP OR WITH SOME HELP ask DD).

DD). How far can you walk out of doors? (assisted or unassisted)

1= 1 mile or more

7= Does not do

2= ¼ mile

8= DK

3= 100 yards

4= 10 yards

5= less than 10 yards

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
E). Can you get about the house	1	2 (walker, crutches, or a chair)	3	4	5
F). Can you go up and down stairs	1	2 (handrails, walker, chairlift)	3	4	5
G). Can you get in and out of bed	1	2 (any type of lift)	3	4	5
H). Can you take a shower or bath	1	2 (shower seat, hand held shower)	3	4	5
I). Can you go to the bathroom or a commode	1	2 (raised toilet seat, walker)	3	4	5
J). Can you use the telephone	1 (look up numbers & dial)	2 (hearing device, special phone, can dial operator in emergency)	3 (help getting numbers, dialing can dial operator in emergency)	4	5
K). Can you get to places out of walking distance	1 (can travel alone on bus, taxi; drives car)	2 (motorized scooter)	3 (need someone to go with you)	4 (Handi-transit)	5 (need special arrange- ments)

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
L). Can you go out of doors in good weather	1	2	3	4	5
M). Can you go out of doors in any weather	1	2	3	4	5
N). Can you go shopping for your groceries or clothes (assuming they have transportation)	1 (take care of all shopping)	2	3 (need someone to go with you on all trips)	4	5
O). Can you prepare your own meals	1 (plan & cook full meals)	2	3 (not full meals)	4	5
P). Can you do your own heavy house- work (eg. scrub floors, vacuum, windows & walls)	1 (scrub floors etc.)	2	3 (can do light but not heavy work)	4	5
Q). Can you do light housework (dusting, dishes, etc.)	1	2	3	4	5
R). Can you do yardwork &/or gardening	1	2	3	4	5

	Without any Help	With some help from a device only	With some help using a person only	With some help from both a person & a device	Unable to do it
S). Can you take your own medicine (in the right doses @ right time)	1	2 (pill counter)	3 (someone prepares it & reminds you to take it)	4	5
T). Can you care for your feet and cut your toenails	1	2	3	4	5
U). Can you handle your own money (this question refers to day-to-day handling)	1 (write checks, pay bills, etc.)	2	3 (can manage day- to-day buying but need help with check book & paying bills)	4	5
V). Can you handle planning your long term finances (eg. investments, banking)	1	2	3	4	5

(MSHA-2 Research Group, 1998, pp. 11-22)

**Appendix P**  
**Lubben Social Network Scale (LSNS)**

Family Networks	Zero	One	Two	Three or Four	Five to Eight	Nine or more
1. How many relatives do you see or hear from at least once a month? (Note: includes in-laws with relatives)	0	1	2	3	4	5
	<monthly	Monthly	Few times a month	Weekly	Few times a week	Daily
2. Tell me about the relative with whom you have the most contact. How often do you see or hear from that person?	0	1	2	3	4	5
	Zero	One	Two	Three or Four	Five to Eight	Nine or more
3. How many relatives do you feel close to? That is, how many of them do you feel at ease with, can talk to about private matters, or can call on for help?	0	1	2	3	4	5
<b>Friends Networks</b>						
4. Do you have any close friends? That is, do you have any friends with whom you feel at ease, can talk about private matters, or can call on for help? If so, how many?	0	1	2	3	4	5
5. How many of these friends do you see or hear from at least once a month?	0	1	2	3	4	5



	<monthly	Monthly	Few times a month	Weekly	Few times a week	Daily
6. Tell me about the friend with whom you have the most contact. How often do you see or hear from that person?	0	1	2	3	4	5

### Confidant Relationships

	Always	Very Often	Often	Some times	Seldom	Never
7. When you have an important decision to make, do you have someone you can talk to about it?	5	4	3	2	1	0
8. When other people you know have an important decision to make, do they talk to you about it?	5	4	3	2	1	0

### Helping Others

9. A) Does anybody rely on you to do something for them each day? For example: shopping, cooking dinner, doing repairs, cleaning house, providing child care, etc.?

No – if “no” on to 9 B)

Yes – if “yes” score as “5” and go to 10.

	Very Often	Often	Some times	Seldom	Never	
9. B) Do you help anybody with things like shopping, filling out forms, doing repairs, providing child care, etc.?	5	4	3	2	1	0

### Living Arrangements

10. Do you live alone or with other people? (Note: Include in-laws with relatives.)

5 = Live with Spouse

4 = Live with other relatives or friends

1 = Live with other unrelated individuals (eg. paid help)

0 = Live alone

TOTAL LSNS SCORE: \_\_\_\_\_

**SCORING:** the total LSNS score is obtained by adding up scores from each of the ten individual items. Thus, the total scores can range from 0 to 50. Scores on each item were anchored between 0 and 5 in order to permit equal weighting of the ten items.

(Lubben, 1988, p.51-52)

**Appendix Q****Spearman Rank Correlation & Pearson's Product Moment Correlation Matrix  
Between Independent Variables and Outcome Variable  
"MD recommended Methods"**

Spearman Rank Correlation & Pearson's Product Moment Correlation Matrix  
Between Independent Variables and Outcome Variable  
"MD recommended Methods"

Script = Pearson's r; *Script* = Spearman's rho

\* $\leq .01$  + $\leq .05$

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. Socioeconomics.	-																			
2. Gender	.140 .140	-																		
3. Age	.046 .034	-.024 -.028	-																	
4. Marital Status	-.223+ -.213	-.279+ -.279+	-.169 -.176	-																
5. Education	-.027 -.074	-.153 -.148	-.215 -.200	.180 .207	-															
6. Social scale	-.227+ -.281+	-.018 -.025	-.107 -.140	.567* .579*	-.145 -	-														
7. Income	-.306* -.282+	-.143 -.172	-.247+ -.272+	.434* .471*	.330* .419*	.404* .439*	-													
8. Self rated health	-.092 -.058	.065 .065	-.257+ -.290+	.023 .023	-.029 -.027	.156 .146	.313* .301*	-												
9. ADL	.198 .267+	-.050 .046	.266+ .272+	-.065 -.097	-.275+ -.296*	-.305* -.264+	-.194 -.241+	-.333* -.290*	-											
10. IADL	-.022 -.038	.033 .102	.434* .483*	.170 .196	-.209 -.146	-.044 -.007	-.103 -.095	-.495* -.473*	.698* .518*	-										
11. Total number Limitations	.036 .039	.013 .121	.416* .487*	.117 .148	-.240+ -.186	-.117 -.058	-.134 -.142	-.482* -.467*	.823* .665*	.981* .977*	-									
12. Chronic conditions	.077 .077	-.026 -.093	.253+ .314*	-.107 -.081	-.282+ -.312*	-.216 -.137	-.291+ -.267+	-.494* -.492*	.388* .401*	.426* .499*	.442* .514*	-								
13. Internal Health Locus of control	.006 .081	-.068 -.054	.129 .109	-.021 -.029	-.150 -.118	-.055 -.102	-.039 -.019	.119 .120	.055 .118	-.010 .028	.007 .056	.048 .049	-							
14. Powerful others Health Locus of control	-.082 -.069	-.089 -.093	.265+ .234+	.177 .177	-.163 -.157	.132 .179	-.077 -.007	-.089 -.075	.159 .126	.235+ .271+	.229+ .264+	.142 .152	.274+ .282+	-						
15. Chance Health Locus of control	-.007 -.027	-.145 -.164	.199 .199	-.110 -.058	-.274+ -.238+	-.078 -.024	-.202 -.195	-.282+ -.272+	.197 .194	.073 .068	.111 .103	.408* .457*	.072 .048	.136 .160	-					
16. Medical Skepticism re: say	.034 .030	-.129 -.101	.014 .048	-.140 -.141	-.188 -.183	-.172 -.161	-.121 -.138	-.242+ -.237+	.122 .087	.047 .011	.070 .027	.280+ .279+	.102 .062	-.005 -.007	.153 .137	-				
17. Medical Skepticism re: do.	.050 .065	.228+ .226+	.038 .055	-.067 -.078	-.024 -.022	-.093 -.168	-.012 -.016	-.022 -.031	-.054 .040	-.014 .030	-.026 .058	.074 .061	.243+ .245+	-.192 -.215	.034 .000	.293* .254+	-			
18. Susceptibility	-.183 -.158	.048 .077	-.019 -.005	.003 -.018	-.149 -.176	.052 .094	-.065 -.140	-.134 -.109	-.011 -.036	.130 .108	.100 .081	.203 .160	-.176 -.237+	-.021 -.002	.007 .032	.027 .053	-.137 -.125	-		
19. Severity	.031 .039	.024 .028	-.127 -.101	-.084 -.056	-.087 -.098	-.157 -.125	.050 .057	-.021 .004	.112 -.095	-.046 -.087	-.007 -.053	.187 .136	.212 .190	-.099 -.071	.091 .040	.061 .035	.163 .163	.016 -.007	-	
20. MD rec methods	.046 .069	.097 .097	.004 -.013	.115 .115	-.161 -.140	.019 .010	-.118 -.101	-.017 -.017	.203 .251+*	.282+ .314*	.278+ .311*	.265+ .298*	.147 .128	-.076 .108	.162 .149	-.120 -.101	-.061 -.065	.087 .067	.076 .059	-

**Appendix R****Spearman Rank Correlation & Pearson's Product Moment Correlation Matrix  
Between Independent Variables and Outcome Variable  
"Professional recommended Methods"**

Spearman Rank Correlation & Pearson's Product Moment Correlation Matrix  
Between Independent Variables and Outcome Variable  
"Professional recommended Methods"

Script = Pearson's r; Script = Spearman's rho

\*≤.01 +≤.05

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. Socioeconomics.	-																			
2. Gender	.140 .140	-																		
3. Age	.046 .034	-.024 -.028	-																	
4. Marital Status	-.223+ -.213	-.279+ -.279+	-.169 -.176	-																
5. Education	-.027 -.074	-.153 -.148	-.215 -.200	.180 .207	-															
6. Social scale	-.227+ -.281+	-.018 -.025	-.107 -.140	.567* .579*	-.145 .153	-														
7. Income	-.306* -.282+	-.143 -.172	-.247+ -.272+	.434* .474*	.330* .419*	.404* .439*	-													
8. Self rated health	-.092 -.058	.065 .065	-.257+ -.290+	.023 .023	-.029 -.027	.156 .146	.313* .301*	-												
9. ADL	.198 .267+	-.050 .046	.266+ .272+	-.065 -.097	-.275+ -.296*	-.305* -.264+	-.194 -.241+	-.333* -.290*	-											
10. IADL	-.022 -.038	.033 .102	.434* .483*	.170 .196	-.209 -.146	-.044 -.007	-.103 -.095	-.495* -.473*	.698* .518*	-										
11. Total number Limitations	.036 .039	.013 .121	.416* .487*	.117 .148	-.240+ -.186	-.117 -.058	-.134 -.142	-.482* -.467*	.823* .665*	.981* .977*	-									
12. Chronic conditions	.077 .077	-.026 -.093	.253+ .314*	-.107 -.081	-.282+ -.312*	-.216 -.137	-.291+ -.267+	-.494* -.492*	.388* .401*	.426* .499*	.442* .514*	-								
13. Internal Health Locus of control	.006 .081	-.068 -.054	.129 .109	-.021 -.029	-.150 -.118	-.055 -.102	-.039 -.049	.119 .120	.055 .118	-.010 .028	.007 .056	.048 .049	-							
14. Powerful others Health Locus of control	-.082 -.069	-.089 -.093	.265+ .234+	.177 .177	-.163 -.157	.132 .179	-.077 -.007	-.089 -.075	.159 .126	.235+ .271+	.229+ .264+	.142 .152	.274+ .282+	-						
15. Chance Health Locus of control	-.007 -.027	-.145 -.164	.199 .199	-.110 -.058	-.274+ -.238+	-.078 -.024	-.202 -.195	-.282+ -.272+	.197 .194	.073 .068	.111 .103	.408* .457*	.072 .048	.136 .160	-					
16. Medical Skepticism re: say	.034 .030	-.129 -.101	.014 .048	-.140 -.141	-.188 -.183	-.172 -.161	-.121 -.138	-.242+ -.237+	.122 .087	.047 .011	.070 .027	.280+ .279+	.102 .062	-.005 -.007	.153 .137	-				
17. Medical Skepticism re: do.	.050 .065	.228+ .226+	.038 .055	-.067 -.078	-.024 -.022	-.093 -.168	-.012 -.016	-.022 -.031	-.054 .040	-.014 .030	-.026 .058	.074 .061	.243+ .245+	-.192 -.215	.034 .000	.293* .254+	-			
18. Susceptibility	-.183 -.158	.048 .077	-.019 -.005	.003 -.018	-.149 -.176	.052 .094	-.065 -.140	-.134 -.109	-.011 -.036	.130 .108	.100 .081	.203 .160	-.176 -.237+	-.021 -.002	.007 .032	.027 .053	-.137 -.125	-		
19. Severity	.031 .039	.024 .028	-.127 -.101	-.084 -.056	-.087 -.098	-.157 -.125	.050 .057	-.021 .004	.112 -.095	-.046 -.087	-.007 -.053	.187 .136	.212 .190	-.099 -.071	.091 .040	.061 .035	.163 .163	.016 -.007	-	
20. Professional rec methods	.046 .079	.175 .175	.052 .038	.019 .019	-.123 -.096	-.031 -.034	-.177 -.165	-.028 -.028	.143 .191	.300* .338*	.276+ .322*	.234+ .278+	.113 .096	.077 .112	.121 .116	-.062 -.036	-.075 -.076	.145 .136	.150 .141	-