The Development of a Health Measure for Homeless People

Dianne S. McCormack

School of Nursing

McGill University, Montreal

June 2010

Research Supervisor:	Dr. Celeste Johnston School of Nursing McGill University
Co-Supervisor	Dr. Jean-Francois Boivin Department of Epidemiology & Biostatistics McGill University
Committee Member:	Dr. Caryn Thompson

A thesis submitted to McGill University in partial fulfilment of the requirements for the degree of PhD (Nursing).

Abstract

The notable lack of a health status measure specific to homeless persons triggered the development of a new instrument, The McCormack Assessment Scale for the Health of the Homeless (MASHH). This study was directed by five purposes: to delineate the empirical indicators that determine the health status of homeless people; to name the determinants of health influencing the health status of homeless persons; to maintain qualitative validation while generating beginning evidence of quantitative validation and reliability; to develop a health status measure for homeless persons that can be self or provider administered, and to gain increased knowledge about health and its determinants. A critical review of the literature revealed that no valid and reliable measure existed. The McCormack Assessment Scale for the Health of the Homeless (MASHH), inductively derived to include the health experiences of homeless persons, is a response to this problem for this population.

A sequential triangulation design was employed for this study. In Stage 1, a theoretical definition was derived and a large item pool was generated from the analysis of qualitative data; in Stage 2, items were examined for clarity by undergraduate nursing research students; in Stage 3, the scale was constructed; in Stage 4, content validation was conducted by two expert groups - homeless persons assessed acceptability and clinical and research nurse experts assessed conceptual relevancy; and in Stage 5, a pilot study was conducted to garner beginning evidence of validation and reliability. Results from the pilot study indicated that MASHH operationalized an internal structure of health that specified 10 determinants influencing the health of homeless persons and delineated critical indicators within each health determinant or subscale. Fundamental to attaining, maintaining, and regaining health for members of this population is the requirement to identify and understand how diverse determinants influence health.

Resume

Le manque notable d'une mesure de l'état de santé spécifique aux sans-abri a déclenché la mise au point d'un nouvel instrument, le Barème d'Appréciation McCormack pour la Santé des Sans-abri (BAMSS). Cette étude a été gouvernée par cinq objectifs : délimiter les indicateurs empiriques qui déterminent l'état de santé des sans-abri; nommer les déterminants de la santé influençant l'état de santé des personnes sans-abri; conserver une validation qualitative tout en générant des preuves préliminaires d'une validation quantitative, fiabilité; mettre au point une mesure de l'état de santé pour les personnes sans-abri qui peut être gérée par ces derniers ou par les prestataires; et enfin acquérir une connaissance accrue de la santé et de ses déterminants. Une révision critique de la documentation a dévoilé l'absence de toute mesure valable et fiable. Le Barème d'Appréciation McCormack pour la Santé des Sans-abri (BAMSS) dérivé par induction pour inclure les expériences en matière de santé des sans-abri, est une réponse à ce problème pour cette population.

Un modèle de triangulation en série a été utilisé pour cette étude. Dans l'étape n°1, on est parvenu à une définition théorique et on a créé un groupe d'items étendu à partir de l'analyse de données qualitatives; dans l'étape n°2, les items ont été examinés, pour clarifier, par des étudiants de premier cycle en recherche en sciences infirmières; dans l'étape n°3 le barème a été construit; dans l'étape n°4, deux groupes d'experts ont procédé à la validation du contenu : les sans-abri en ont évalué l'acceptabilité et des experts en recherche clinique et en sciences infirmières en ont évalué la pertinence conceptuelle; dans l'étape n°5, on a mené une étude pilote pour recueillir des preuves préliminaires de validation et de fiabilité. Les résultats de cette étude pilote ont indiqué que le BAMSS opérationnalisait une structure interne en matière de santé qui spécifiait 10 déterminants influençant la santé des personnes sans-abri, et délimitait des indices de crise au sein de chaque déterminants de la santé ou sous-échelle. Pour que les membres de cette population aient, conservent ou recouvrent la santé, il est essentiel de pouvoir identifier et comprendre la façon dont divers déterminants influencent la santé.

Dedication

This thesis is dedicated to my husband, Eric P. McCormack, who listened to endless dialogue, assisted with figures and tables, and above all else, was my source of strength and inspiration. Thank you for being my rock; your support and encouragement was a necessary ingredient to my success.

Acknowledgements

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THE DEVELOPMENT OF A HEALTH MEASURE
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Chapter 1

Health had been a subject of interest to mankind for centuries. From ancient Greece to present day, this concept had been described and defined by nurses, doctors, psychologists, sociologists, philosophers, theologians, economists, educators, and many others (Etches, Frank, Di Ruggiero & Manuel, 2006; Keller, 1981; Liaschenko, 1998; Smith, 1981; Tamm, 1993). Yet the defining elements of this concept remained a mystery. For some, health was the absence of illness; for others, health was an ability to thrive and to experience growth and development. Generally, the idea of both positive and negative states existing within health was accepted (Blaxter, 1990; Litva & Eyles, 1994; Munro, et al., 2000; Patrick, Bush & Chen, 1973; Schlenger, 1976; Woods et al., 1988).

The diversity of descriptions between disciplines, and even within disciplines, indicated that health was a general concept. Becker (1983) recognized that health is a macro concept or one which is general in nature "...and can lend flexibility in the process of structuring knowledge....The intention of macro concepts is to deal with the whole rather than the parts and consequently a large number of variables comprise the macro concept" (p. 55). In the development of this health status measure, health was viewed as a macro concept with multiple determinants or subscales comprising the whole. Furthermore, health status was assessed by considering all determinants.

The Population Health Framework (Federal, Provincial, and Territorial Advisory Committee on Population Health [ACPH], 1994) established that health status was dependent on the health determinants defined by the five major categories of social and economic environment, physical environment, health services, personal health practices, and individual capacity and coping skills with the determinant of healthy child development transcending all major categories. (See appendix A.)

Health status had been assessed traditionally using quantitative indicators of mortality and morbidity, as well as the single item global health measures

(Johnson, et al., 2008; Public Health Agency of Canada, 2010; Richmond & Ross, 2009; Roos & Mustard, 1997). However, the limitations of these indicators had been noted throughout history to current time (Etches, et al., 2006; Strategic Policy Directorate…, 2001). Bowen and Kreindler (2008) indicated that if important questions were to be answered, critical indicators must be identified. These authors urged researchers to identify the best indicators and avoid the temptation to use already developed indicators that might be a poor fit with the population and/or the construct of interest. Johnson and colleagues recommended that indicators be both culturally appropriate and community relevant.

The challenge for this study was to identify determinants and indicators that captured health status for homeless people. Given the increased numbers of homeless people in Canada (Canadian Public Health Association, 1997; Crowe, 2007; Falvo, 2003; Halifax, Yurichuk, Meeks & Khandor, 2008; Hulchanski, 2000; Hurtubise, Babin & Grimard, 2009; National Housing and Homelessness Network, 2001; Neal, 2004; Rachlis, Wood, Zhang, Montaner & Kerr, 2008; Scott, 2007; Toronto Report Card, 2003), health care providers needed to understand the factors or determinants that influence health status in this population.

Research had demonstrated that health providers required appropriate data about this population when choosing to develop or implement appropriate interventions (Fitzpatrick, LaGory & Ritchey, 2003; Reichenbach, McNamee & Seibel, 1998; Rosengard, Chambers, Tulsky, Long & Chesney, 2001). Furthermore, if health policy was to become inclusive and responsive to the needs of all Canadians, policy makers needed to name and understand the health determinants that had the greatest influence on the health experiences of homeless people. Fundamental to attaining, maintaining, and regaining health for members of this population was the requirement to identify and understand how diverse determinants influence health. The need to develop a health status measure for this unique and vulnerable population was evident.

Purpose

The development of a new health status scale to measure health experiences of homeless persons was directed by five purposes:

1. To delineate the empirical indicators that determine the health status of homeless people;

2. To name the determinants of health influencing the health status of homeless persons;

3. To maintain qualitative validation while generating beginning evidence of quantitative validation and reliability;

4. To develop a health status measure for homeless persons that can be self or provider administered; and

5. To gain increased knowledge about health and its determinants.

These purposes resulted in a critical review of literature. This review confirmed that a new health status measure specific to the health experiences of homeless people was needed.

Statement of the Problem

Despite dialogue in the literature, theoretical and operational definitions of health were often inconsistent (Patrick, et al., 1973; Reynolds, 1988). For example, in the nursing literature health was theoretically defined as a multidimensional holistic concept but was most often operationalized in nursing research as a unidimensional clinical concept (Reynolds). Meleis (1990) concurred with Reynolds and further elaborated that nurse scientists had yet to develop measures that captured the totality of health experiences. Although nurse scholars and others recognized the importance of the conceptual link between theoretical and operational definitions (Waltz, Strickland & Lentz, 2005), the paucity of holistic health measures presented a challenge for scholars. Evidence from qualitative studies (Berman, 1999; Blaxter, 1995, 1997; Colantonio, 1988; Daiski, 2007; Kenny, 1992; McCormack & Gooding, 1993; McCormack & MacIntosh, 1998; McKague & Verhoef, 2003; Morse, 1987; Woods et al., 1988) validated that health was experienced as a whole made up of many dimensions. Health perceptions of lay persons were aligned with multidimensional holistic

theoretical definitions, yet lay perceptions were rarely operationalized in health measures. Operational definitions that reflected theoretical holistic definitions needed to be developed.

Theoretical Definition & Framework

Theoretical definitions of health found in the literature had been analysed and compared to lay conceptions of health that were uncovered in many qualitative studies. In order to avoid accepting a definition a priori from the perspective of the researcher, the theoretical definition for this health status measure emerged from secondary analysis of qualitative data that made known the patterns of living health as described in interviews with homeless persons. This process of developing a theoretical definition was adopted so that the subjective experiences of health for this population were endorsed and respected (van Hooft, 1997; Oakley, 1993; Plummer & Molzahn, 2009).

Although the determinants of health for homeless persons were named and defined through applying methodological procedures from qualitative and quantitative research traditions, the health determinants within the Population Health Framework were used as a conceptual benchmark or comparative model. Because the health determinants that influence health status hold unique experiences for different population groups, variation in the determinants was expected and confirmed (Blaxter, 1997; Richmond & Ross, 2009; Strategic Policy Directorate…, 2001; Wilson, Eyles, Elliott & Keller-Olaman, 2009).

Conclusion

The primary purpose of this research was to develop a health measure to assess the health status of homeless persons living in Canada. This newly developed measure delineated empirical indicators and named subscales/ determinants of health that defined the abstract experience of living health when homeless or without permanency in living accommodations.

Chapter 2

Literature Review

The science of nursing has identified at least four major ways in which the construct of health is conceptualized: a dichotomous variable, a continuum, a distinct and separate variable from illness, and a holistic state which emphasizes a person's general well being including wholeness, unity, and individuality. Although each conceptualization of health is supported by different nurse theorists (Hanchett, 1990; Jones & Meleis, 1993; Meleis, 1990; Tripp Reimer, 1984; Woods, et al., 1988), the more inclusive holistic state provides nursing with a definition that equates health "...with the totality of life processes to be experienced;" (Payne, 1983, p. 395). This notion of health can be historically linked to the modern beginnings of nursing science in that Nightingale (cited in Keller, 1981) described health as " not only to be well, but to be able to use well every power we have" (p. 53).

Health Providers Define the Health Concept

In an effort to elucidate the concept of health, Smith (1981) undertook a philosophical inquiry that resulted in the development of four progressive models or conceptions of health described as clinical, role performance, adaptive, and eudaimonistic. This inquiry identified numerous meanings, and within each of the four distinct conceptions of health, the health-illness continuum was the one salient feature. The four models, or standards, developed by Smith were organized as a progressive scale so that a person's health could be measured against specified standards. The clinical and role performance models focused on stability while the adaptive and eudaimonistic models focused on change and growth.

The clinical model closely resembled the biomedical model while the role performance model depicted a functional level of health or the person's ability to perform expected social roles or tasks (Baranowski, 1981; Perry & Woods, 1995; Simmons, 1989). This latter approach was also known as a performance orientation to health (Baumann, 1961). People with this health orientation described being able to participate in activities of daily living and meet role obligations (Dolfman, 1973).

The adaptive model of health emerged from views of health that delineated one's ability to effectively interact with, and adjust to, environmental changes (Dolfman, 1973; Simmons, 1989). This health conception called for flexible adjustment to changing circumstances including the ability to adapt to environmental stresses (Perry & Woods, 1995; Smith, 1981). The eudaimonistic model encompassed the wholeness nature of health. People who embraced this model have a difficult time reducing experiences of health into various parts or dimensions of health. A eudamonistic health conception portrayed exuberant well-being; the ability to transcend usual and ordinary life situations to achieve higher levels of well-being and humanness (Smith, 1981).

The Health Concept as Dichotomous Variable

The aim of medical practice has been to alleviate pain and suffering through curing and preventing diseases (Hoke, 1968). Because this aim is aligned with a disease orientation, the definition of health as the absence of disease is accepted (Bruhn, Cordova, Williams & Fuentes, 1977; Eberst, 1984); making the absence of disease a precondition of health (Baranowski, 1981; Simmons, 1989). The early historical perspective of health that "has been used and accepted for as long as the word health has existed" (Dolfman, 1973, p. 8) identified health as soundness of body or being without disease. This perspective corresponded with health as described in the clinical model described by Smith (1981) or the symptom-orientation approach taken by clinic patients who not only described their own signs and symptoms of disease, but also identified health as being without signs and symptoms of disease (Baumann, 1961). Disease is viewed as an undesired state that needs to be fixed (Hoke).

The Health Concept as Continuum

When health is expressed as a continuum, one can visualize the unidimensionality of the concept (Audy, 1971; Schlenger, 1976; Sim, 1990); various degrees of health and disease are signified along the continuum. Health is viewed as the polar opposite of disease and death (Winstead-Fry, 1980). The degree of health experienced by a person is located on a single line between two

end points; health and death. According to Bruhn and colleagues (1977), a state of health involved an objective assessment at a particular point in time.

This notion of health as a continuum indicated that a single dimension can adequately and comprehensively describe health (Schlenger, 1976). According to Audy (1971), this view of health created the greatest obstruction to furthering a comprehensive understanding of a complex concept. In the clinical model, health decreased when signs and symptoms of disease are present and increased when these signs and symptoms of disease diminish (Bruhn, et al., 1977). The absence of either health or disease confirmed the existence of the other (Dolfman, 1973; Simmons, 1989). When health is viewed from the role performance model, level of function determined ones placement on the continuum (Baronowski, 1981).

Dunn (1959a) extended the continuum of health to a graduated scale. In his perspective, the health/death continuum was intersected by an environmental continuum that ranged from a very favorable environment at one end to a very unfavorable environment at the other end. The environmental continuum was a composite of physical, biological, socioeconomic, and cultural factors. In this conceptualization of health the multidimensional aspect of the concept was recognized.

The Health Concept as Separate from Disease

Dubos claimed that curing disease did not automatically create health; an endeavour that required "wisdom and vision" (1959, p. 33). Audy (1971) proposed that health continued to exist despite the presence of disease, or other negative or positive insults. He identified these insults as critical development periods or opportunities whereby learning and coping experienced during an insult enhanced health far more than any hindrance that may have been created by the insult. This perspective of health is consistent with the idea of gaining personal meaning from an illness event to the extent that one is transformed by the experience (Herberts & Eriksson, 1995; Moch, 1989, 1998).

Allen (1979) identified health as a distinct and separate variable from illness and related health to "...potentials, strengths and aspirations and not to inadequacies, lack and limitations" (p. 57-58). She conceptualized health as "...a

way of living, of being, it is a way of growing, of becoming" (Allen, 1981, p. 153). Health and illness were depicted as two separate intersecting variables that co-existed (Ford-Gilboe, 1994). Health reflected the summation of a person's coping skills and growth seeking behavior (Allen, 1982; Ford-Gilboe). Individuals or families entered into this health process at any point in the life cycle (Allen, 1982) and were influenced by their perception of health, the energy and time contributed to the task, and the ability to develop and mobilize resources to improve fulfillment in life and to attain a healthy lifestyle. Allen's conception of health assumed that people have access to resources and/or conditions that promote health. This perspective is supported by Simmons (1989) who referred to health as a self actualization process that promoted personal growth and productive living. Others referred to health as a journey or a process that leads to growth and development (Dunn, 1959b; Greifinger & Grossman, 1977; Perry & Woods, 1995; Woods, et al., 1988).

The Health Concept as Holism

One conception of holism was that of totality. According to Dunn (1959b), individuals had "a continuum of body, mind, and spirit within an ever-changing environment and flow of events" (p. 448). He stressed the importance of harmony between the facets of a person's nature and the providers providing health assistance. Harmony suggested that health was dynamic; involving an interaction between the person and the environment that transcends into wholeness (Cmich, 1984; Smith, 2002). The American Holistic Nurses' Association described health as "...the harmonious balance of body, mind and spirit in the ever changing environment" (as cited in Brouse, 1992, p. 324). Holistic practitioners "incorporate life-style patterning with other therapies that include the physical, mental, emotional and spiritual dimensions of intervention and support" (Keegan, p. 6). Mansour (1994) claimed that health "exists when the body and mind are strong, the emotions are sound, spiritual expression is whole and the lifestyle is sane" (p. 171).

The tenets of wholeness and change were consistent across the descriptions of holism. Wholeness indicated that the whole rather than the parts

must be examined and the whole was greater than, and different from, the sum of the parts. Change suggested transitions; moving forward. These transitional processes were related to development and were valued (Brouse, 1992). Health was depicted as an experience that involved the wholeness of living through multiple developmental and situational transitions.

     Wholeness and the socio-political domains of health. The description of health developed by Munro and colleagues (2000) named health dimensions that extended beyond the person, and outside the health care sector to include political, economic, and social factors. These influencing factors were consistent with the socioeconomic, or socioenvironmental, approach to health care inherent in the determinants of health model that has gained recognition and some acceptance in Canada (Bezruchka, 2001; Cohen & Gregory, 2009; Kindig, 1997; Letourneau, 2009; Link & Phelan, 1995; MacKay, 2001; McGibbon, Etowa & McPherson, 2008; McKague & Verhoef, 2003; Newbold, 1998; O'Hara, 2006; Raphael, Curry-Stevens & Bryant, 2008; Richmond & Ross, 2009; Wilson, et al., 2009). In the determinants of health model, all psychosocial risk factors and socioeconomic risk conditions are considered when determining health status (ACPH, 1994; Strategic Policy Directorate…2001). The socioeconomic conditions provided the context for personal health factors, and individual capacity and coping skills to be developed or constrained. (See appendix A.) Key health determinants included; income and social status, social support networks, education, employment and working conditions, physical environments, biology and genetic endowment, personal health practices and coping skills, healthy child development, health services, gender, cultural, and social environment (ACTH; Health Canada, 1996; Public Health Agency of Canada [PHAC], 2010; Public Health Association of Canada, 2002; Strategic Policy Directorate…). These determinants did not influence health in isolation but were interconnected and when combined created an overall influence on health (Hamilton & Bhatti, 1996; McKague & Verhoef; O'Hara; Richmond & Ross; Strategic Policy Directorate…).

Lay Conceptions of Health

The relativity of the health concept suggested that the internal structure of health was likely to vary from one population group to another. Nurse researchers and others had been using a variety of research methods to explore the conceptions of health held by citizens (Berman, 1999; Blaxter, 1995, 1997; Colantonio, 1988; Daiski, 2007; Davis, et al., 1991; Emani, Benner, Lipson & Ekman, 2000; Haggman-Laitila, 1997; James & Eyles, 1999; Kenny, 1992; Lindsey, 1996; Litva & Eyles, 1994; Maddox, 1999; Mansour, 1994; McCormack & Gooding, 1993; McCormack & MacIntosh, 2001; McKague & Verhoef, 2003; McWilliam, Stewart, Brown, Desai & Coderre, 1996; Morse, 1987; Perry & Woods, 1995; Popay, et al., 2003; Richmond & Ross, 2009; Rose, 1990; Rosenbaum & Carty, 1996; Woods et al., 1988). The results of these studies confirmed that the concept of health has multiple meanings that evolved from diverse living situations (Dolfman, 1974; Manderbacka, 1998; Meleis, 1990) that are simultaneously influenced by personal, demographic, social, and cultural variables (Baumann, 1961; Blaxter, 1990; Crawford, 1984; Liaschenko, 1998; McKague & Verhoef; Meleis; Perry & Woods; Popay et al.; Richmond & Ross). The definition adopted, or the meaning accepted, influences health actions (Liaschenko).

In a study conducted by Colantonio (1988), the most recurrent attributes of health referred to by adult citizens included "being fit, particularly with reference to fulfilling both necessary and desired activities, ...[having] a positive emotional and physical state (feeling and looking well)", and evading illness (p. 5). In a study of adult women, Woods and colleagues (1988) uncovered a rich variety of health images: "The most frequently reported categories included clinical, positive affect, fitness, practicing healthy life ways, and harmony" (p. 42). Another study conducted by Kenney (1992), revealed that "women may be more inclined toward health-related behaviors which will enhance their self-concept or improve their health promotion behaviors, while men may be more inclined to improve their body image or fitness" (p. 834). When Berman (1999) asked children who had witnessed violence through war or domestic abuse about the meaning of health to

them, a multidimensional perspective connected health with "not being sick, being able to do what you want to do, being mentally healthy and happy and stuff like that, and just getting through the day" (p. 97).

In examining the reported health perceptions held by lay persons, Calnan (1987) identified that in all studies reviewed, health was more than the absence of disease, and in all but one study both positive and negative aspects of health were presented. One study reported that people from lower socioeconomic classes did not have a positive conception of health but viewed health from a functional perspective of being able to complete tasks (Blaxter & Paterson, as cited in Calnan). Even though the absence of disease remained an element of health that was identified in most studies, Blaxter (1997) reported that survey data indicated that health was an inclusive concept separate and different from illness. These findings supported the definition of health as separate from disease.

This review of the literature indicated that even though lay perceptions of health were multidimensional, differences exist between population groups. Conceptions of health had both common elements and unique variations (Blaxter, 1995; Herberts & Eriksson, 1995; Staniszewski, Ahmed & Jenkinson, 1999). Therefore, lay conceptualizations of health did not have conceptual universality. The underlying conceptions of health held by a particular population must be understood, prior to selecting either a scale to measure health or indicators that depict health for that population (Baumann, 1961; Dolfman, 1974).

Homeless Persons Conceptions of Health

Health is compromised when housing is below standard and challenged further when housing is absent (Alley, et al., 2009; Barrow, Herman, Cordova & Struening, 1999; Canadian Population Health Initiative…, 2009; Canadian Public Health Association, 1997; Carter & Polevychok, 2004; Conway, 1995; Daiski, 2007; Dickey, Latimer, Powers, Gonzalez & Goldfinger, 1997; Frankish, Hwang & Quantz, 2005, 2009; Harris, 1999; Jackson & McSwane, 1992; Kyle & Dunn, 2008; Lechky, 1999; McDonald, Donahue, Janes & Cleghorn, 2009; Power, et al., 1999; Scott, 2007; Segal, Gomory & Silverman, 1998; Spector, 1999; The Street Health Report, 2007; Thomson, Thomas, Sellstrom & Petticrew, 2009; White, C.,

1999; White, M.E., 1999). All people have a right to housing that is adequate for health and well being (United Nations, 1948). All people need a place to feel at ease (Daiski, 2007; Hatty, 1996; Hudson-Rodd, 1998; Scott; 2008: Stuart & Arboleda-Florez, 2000). In Canada, survival is often dependent on protection from the elements. Homeless persons expend tremendous energy in survival strategies; obtaining shelter, food, and a place to rest (Capponi, 1997, 1999; Crowe, 2007; Davis, 1996; Greene, Ennett & Ringwalt, 1999; McCormack & Gooding, 1993). Only after having satisfied these basic human needs are homeless persons able to consider other issues related to their health (Bawden, 1990; Burg, 1994; Crowe; Flynn, 1997; Gelberg, Gallagher, Andersen & Koegel, 1997; Gillies, Tolley & Wolstenholme, 1996; Nyamathi, et al., 1999; Power, et al., 1999; Terrell, 1997; The Street Health Report). In fact high risk behavior such as survival sex is a strategy used by street youth to satisfy basic human needs (Greene et al.; Halc´on & Lifson, 2004; Kipke & Unger, 1997; Rew, 2001; Roy et tal., 2003, 2004; Scott).

In 1997 the Canadian Public Health Association released a position paper on homelessness and health. Homelessness was presented as a fundamental health issue. Cause for concern was based on growth in absolute and in relative numbers of homelessness occurring within Canada. The emergence of increased numbers of homeless women, children, youth, native persons, and the mentally ill fueled this concern. The consequences of eroding social housing which began in the mid 1980s were being felt. This erosion continued into the next decade despite reprimands from the United Nations who in 1998 suggested that Canada declare housing as a National Emergency (as cited in Scott, 2007). Therefore, being able to understand health situations and to assess health concerns experienced within this growing population was expected of health care providers.

Health Experiences of Homeless People

Homeless people perceived health as being multidimensional. A phenomenological study conducted by McCormack and Gooding (1993) identified ten characteristics of health espoused by homeless persons; satisfying basic human needs, having no illness-related complaints, doing the work of

health, fulfilling a functional role, having a positive self-image and outlook, being fit, having a support network, eschewing the use of addictive drugs, having good hygiene, and structuring the day. Other characteristics had been identified but described less often. The identified characteristics indicated that the health experiences of homeless persons included more than the absence of disease. In fact, like other studies that investigated the lay perspective of health of housed people, many determinants influence the homeless person's experience of health. Other studies conducted within this population confirmed that homeless people described health as a multidimensional concept (Daiski, 2007; McCormack & MacIntosh, 2001; Morse, 1987).

Survival behaviors were paramount to living and include such behaviors as searching for food, a safe place to sleep, and shelter or protection from the elements (Davis, 1996; Greene, et al., 1999; McCormack & Gooding, 1993; McCormack & MacIntosh, 2001; Nyamathi & Flaskerud, 1992; Rosengard, et al., 2001). In a study conducted by Acosta and Toro (2000) physical safety had the highest mean rating out of 20 items on a needs assessment questionnaire. This item was followed by education, transportation, and affordable housing. Perhaps these participants viewed education as a way of obtaining other essential needs; suggesting a future orientation. Other studies suggested that homeless people and others who live in poverty have a present orientation and have minimum hope for the future (Davis, 1996; Martin & Henry, 1989).

After satisfying basic human needs, homeless people attended to other health related concerns. In a study conducted by McCormack and MacIntosh (2001), the homeless person assumed the role of health assessor. This active participation might have resulted from the belief that being and feeling healthy ensured being able to carry out behaviors necessary for survival. In that study the first pathway to health selected by homeless people involved choosing a lifestyle behavior to alleviate a current health challenge or to support being healthy. Sometimes a behavior that hindered health needed to be modified or eliminated, other times new health behaviors were added. When lifestyle behaviors selected did not promote health, access to health services was attempted.

Responsibility for self maintenance of health surfaced in other studies conducted within this population (Martin & Vacha, 1994; Martins, 2008; McCormack & Gooding, 1993; Rew, 2003; Williams, Lethbridge & Chambers, 1997). Results from a Toronto study indicated that 24% of the 368 homeless adults surveyed engaged in self treatment (The Street Heath Report, 2009). Homeless people are motivated to participate in strategies that enhanced their survival and promoted their personal well being (Boydell, Goering & Morrell-Bellai, 2000; Butler, 1993; Conner, Ling, Tuttle & Brown-Tezera, 1999; Goering, Durbin, Trainor & Paduchak, 1990; McCormack & Gooding; McCormack & MacIntosh, 2001). Essentially, the intrinsic need for people to desire and seek health is universal (Herberts & Eriksson, 1995).

Participants in a study conducted by McCormack and MacIntosh (2001) indicated that barriers often evolved from a fragmented complex system of help that was difficult to negotiate. Other researchers also found that the system of help that professionals, including nurses, appear to be supporting was fragmented (Bechtel, 1997: Douglass, Torres, Surfus, Krinke & Dale, 1999; Goering, et al., 1990; Goldfinger et al, 1999; Hatton, Kleffel, Bennett & Gaffrey, 2001; Martins, 2008; Power et al, 1999; Rosenheck, Frisman & Kasprow, 1999; Rosenheck et al., 1998; Stein, Anderson & Koegel, 2000; Stuart & Arboleda-Florez, 2000; Wenzel, et al., 2001; Wojtusik & White, 1998). Applewhite (1997) described the current system of help as "a complex maze of programs and services with limited resources, staff that are excessively spread out, and inadequate funding". This situation is further compounded when homeless people are isolated from mainstream society (Anderson & Hatton, 2000; Bechtel; Boydell, et al., 2000; Lechky, 1999; Lightman, 1997; Power, et al.; Powers & Jaklitsch, 1993; Vissing & Diament, 1997).

Even when services are designed to address the health needs of homeless persons, access to appropriate health care remains a challenge for many (Cousineau, 1997; Douglass, et al., 1999; Gelberg, et al., 1997; Hwang & Gottlieb, 1999; The Street Health Report, 2009; Ugarriza & Fallon, 1994; Wen, Hudak & Hwang, 2007; Wojtusik & White, 1998). People who are homeless are

encountering many competing priorities (Gelberg, et al.), and are addressing multiple health barriers (Applewhite, 1997; Daiski, 2005, 2007;Connor, et al., 1999; Cousineau; Hatton, 2001; Martins, 2008; McDonald, et al., 2009; Power, et al, 1999; Riemer, Van Cleve & Galbraith, 1995; Rosenheck, et al., 1999; Sachs-Ericsson, Wise, Debrody & Paniucki, 1999; Segal, et al., 1998; Stein, et al., 2000; The Street Health Report; Wen, Hudak & Hwang; Wenzel, et al., 2001; Wojtusik & White; WHO, 2005).

Power and colleagues (1999) and Bond (1999) suggested that a multisectoral approach, attentive to the hierarchy of needs experienced by homeless people, is needed to decrease barriers to health promotion. Another study examining access to housing services claimed that service system integration is required if improved access to housing services is to be achieved (Rosenheck et al., 1998). Goldfinger and colleagues (1999) suggested that particular attention be paid to structural and political factors in conjunction with personal factors so that the vulnerabilities of the homeless population could be understood. McCormack and MacIntosh (2001) strongly recommended that an intersectoral approach is needed when providing services to enhance health experiences of homeless persons. These services need to cross, but is not limited to, health, education, social welfare, law, trade, and industry boundaries (Frankish, et al., 2005, 2009: Gillies, Tolley & Wolstenholme, 1996; McCormack & MacIntosh; Reichenbach, et al., 1998).

In summary, homeless people view health as a multidimensional concept; indicating that perspectives of health are unique to a specific population and even finer distinctions are made for individuals. Health is not broken down into parts or dimensions but experienced and lived as a whole. People experience health as a process of living.

Health Measures

In a review of the nursing literature, only one health scale, Laffrey's Health Conception Scale, that had empirical indicators reflecting the holistic view of health espoused by the nursing discipline and inherent in lay perceptions of health was found (Laffrey, 1986). This scale was user friendly, could be self-

administered or used as part of an interview, and took only 10 minutes to complete. However, items did not reflect what is known about the lives of homeless people.

Other scales examined for both potential use, and/or opportunity to borrow or revise items included, but not limited to, the World Health Organization Quality of Life (WHOQOL Group, 1998), SF-36 (Ware, cited in McDowell & Newell, 2006), The Life Satisfaction Index (Neugarten & Havighust, cited in McDowell & Newell), The Health Perceptions Questionnaire (Ware, cited in McDowell & Newell), Life Assessment Questionnaire (Richter,1988), and the Cognitive Appraisal of Health Scale (Kessler, 1998). Although these scales included various dimensions of health, these scales did not reflect what is known about the health experiences of homeless people and were not as comprehensive as Laffrey's Health Conception Scale. However, insights into scale format and response categories were gleaned from these scales; making the review of available health measures a helpful activity.

Some researchers have modified scales in order to investigate various facets of life experienced by homeless people (Bogard, Trillo, Schartz & Gerstel, 2001; Gamache, Rosenheck & Tessler, 2003; Nyamathi, Flaskerud, Leake & Dixon, 2001; Rew, Taylor-Seehafer, Thomas & Yocky, 2001; Whaley, 2002), while other researchers have developed questionnaires to address the specific needs of a particular research study (Acosta & Toro, 2000; Friedman, Meschede & Hayes, 2003; Green, Hankins, Palmer, Boivin & Platt, 2004; Roy, et al., 2003, Roy, Haley, Lemire, Boivin, Leclerc & Vincelette,1999).

Studies that included an assessment of health status in this population tended to rely on mortality or single item global health measures. More specifically, the one item global measure that ranks health from excellent to poor on a five or four point scale was used most frequently (Fitzpatrick, et al., 2003; Frank, Cohen, Yen, Balfour & Smith, 2003; Nyamathi, et al., 2004; Reichenbach, et al., 1998; Rosengard,et al., 2001). Roos and Mustard (1997) pointed out that the standardized mortality ratio is accepted as a valid single indicator of health status from birth to age 74. In their analysis, people with the lowest income experienced

the highest mortality. Mortality studies conducted in Montreal (Roy, Boivin, Haley & Lemire, 1998: Roy, et al., 2004) and Toronto (Cheung & Hwang, 2004; Hwang, 2000, 2002) confirmed high mortality rates for homeless people. When compared to the general population mortality rates for persons aged 45 or less were extremely high (Cheung & Hwang; Hwang, 2000; Roy, et al., 2004). Another study that utilized national census data further confirmed that the mortality rate for Canadians living in shelters, rooming houses and hotels was substantially higher than those citizens clustered in the poorest income adequacy fifth determined by total pre-tax income (Hwang, Wilkins, Tjepkema, O'Campo & Dunn, 2009).

Conclusion

Because homeless people like other lay persons, described health as multidimensional, a single item or global measure did not indicate the determinants important to members of this population (Congdon, 2001; Manderbacka, 1998). Other researchers have concluded that a health measure to capture the determinants of health experienced by homeless persons is needed to give direction in developing and choosing effective interventions and in developing comprehensive health policy (Boivin, Roy, Haley & Galbaud du Fort, 2009; Frankish, et al., 2009; Reichenbach, et al., 1998; Rosengard, et al., 2001). This study developed this measure and beginning evidence of reliability and validity is provided.

Chapter 3

Methods

Research Design

A sequential triangulation design for a total of five stages directed this study. (See figure1.) Qualitative methods used in Stage one to develop the item pool and theoretical definition were followed by an item clarity assessment in Stage 2, scale construction in Stage 3, the application of a modified quantification process, the Content Validity Index (CVI), in Stage 4, and an iterative process using reliability analyses and confirmatory factor analysis in the initial psychometric testing of the operational definition in Stage 5.

Figure1. Sequential Triangulation Research Design.
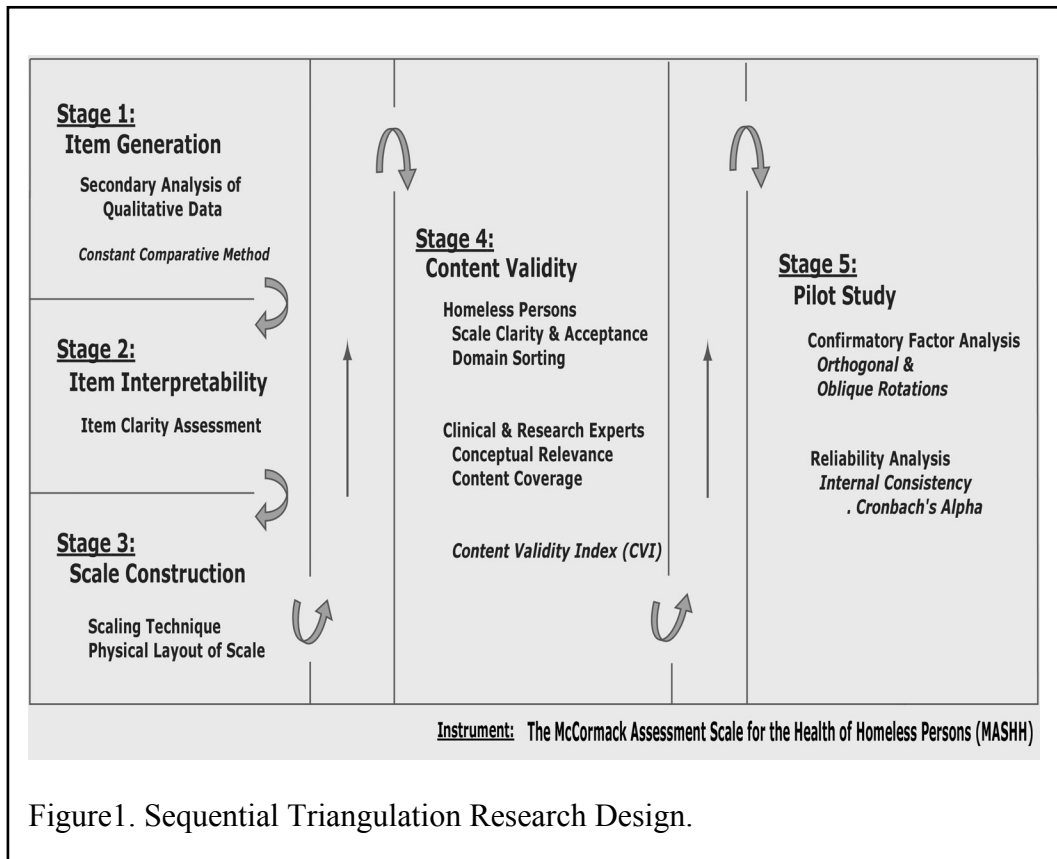
Qualitative methods are recommended in instrument development when the researcher is seeking to capture the defining attributes of an abstract concept (Aamodt, 1983; Tilden, Nelson & May, 1990) or is attempting to identify the

particular pattern in which a concept is experienced (Fleury, 1993). Because qualitative data were likely to expand what was already known about the concept of health experienced by homeless people, the empirical indicators generated were more likely to give a better representation of the full range of health determinants than that available in published literature and other instruments, and be logically connected to the inductively derived theoretical definition of health (Hall & May, 2001; Imle & Atwood, 1988; Tilden, et al.; Waltz, et al., 2005). Hall and May claimed that items generated using an inductive approach reflected the experiences of participants in their own words and were generally of better quality than items from other sources. The theoretical definition for this study was developed inductively in Stage 1) Item Generation. Items, sub-scales or determinants, and the operational definition that is a parallel form of the theoretical definition were developed in five sequential stages: 1) Item Generation, 2) Item Interpretability, 3) Scale Construction, 4) Content Validation, and 5) Psychometric Testing.

Stage 1: Item Generation

The purpose in this stage was to develop the item pool and the theoretical definition. An inductive approach to item generation and to theoretical definition construction respected homeless persons' experiences of health, and uncovered the conceptual meaning of living health within the environmental context of not having a home.

Secondary Analysis

A composite of two types of secondary analysis for qualitative data was selected (Heaton, 2004). Because the purpose of this secondary analysis was different from the purposes of the primary studies, new questions were asked and the literature context was different. According to Heaton, when data are analyzed from within the context of different literature and purposes, the secondary analysis is distinguished from the primary analysis and described as supra analysis. The three research questions directing this secondary analysis were: 1) What health indicators describe the health experiences of homeless people? 2) What health

determinants describe the indicators/items generated? 3) What is the theoretical definition of health for homeless persons?

Because a comprehensive list of items was desired, two data sets were combined. This course of action, a distinguishing feature of amplified qualitative secondary analysis (Heaton, 2004), resulted in two complete data sets derived from previously conducted primary research studies being combined into a single data set. In order to gain an in-depth understanding of the construct of health for homeless persons, a secondary analysis of qualitative data using the distinguishing features of supra and amplified analyses were conducted.

Data set. The two combined data sets created the data set for this secondary analysis. In total, the narrative text of 40 transcribed interviews with homeless persons resulted in 1478 pages of data (McCormack & Gooding, 1993; McCormack & MacIntosh, 2001). Although the guiding questions were similar in both studies, two different qualitative designs were used. In the earlier study (McCormack & Gooding), phenomenology directed the analysis of 29 interviews with homeless people who were currently accessing shelters in the downtown core of an urban city in Ontario. This study uncovered four conceptions of health and ten characteristics of health. In the second study (McCormack & MacIntosh), 11 interviews were conducted and analyzed using the grounded theory approach. This study resulted in a theoretical representation or a construction of a basic social process of how homeless people achieve health. Participants in this study were accessing the services of homeless shelters in three small cities in New Brunswick.

All interviews were tape recorded as participants shared their ideas about health, rated themselves as healthy or unhealthy, described why they thought they were healthy or unhealthy, and related how they managed their health while living without a home. The interviews were all conducted in a private area in shelters providing temporary protection from the elements.

In both studies, data collection continued until redundancy of information or theoretical saturation was reached. Because an iterate process of data analysis and data collection was employed, saturation or sample adequacy was accepted

when replication of data were evident. In other words, no new ideas about health were emerging from the narratives. According to Morse (1986), "sampling ceases when the researcher gains understanding of the situation or setting, obtains coherence, does not collect any new information, and cannot locate negative cases" (p. 186). In qualitative studies, evidence of sampling adequacy is determined by saturation or replication of data (Morse, 2001; Morse, Barrett, Mayan, Olson & Spiers, 2002). When researchers described data as having saturation, redundancy, or consensus, no new ideas are being generated in the copious amount of verbatim data gathered (Glaser & Strauss, 1966; Sandelowski, 1995). Completeness and amount of information takes precedence over number of cases (Morse 1986, 2000; Sandelowski).

Data reduction. Using the constant comparative method of qualitative analysis, one piece of data or data bit (datum or element of data) was compared to all other data bits that were similar or different, so that patterns across interviews could be discerned (Field & Morse, 1985; Thorne, 2000; Turkel & Ray, 2001). This process was used to cluster data bits so that the homogeneity of the underlying pattern becomes visible as in reliability estimates (Atwood & Hinds, 1986). In this secondary analysis, after identifying and comparing each data bit to all other data bits, codes that assign meaning to the data bits were inductively derived. By using these codes to attach meaning to the data bits, data in the data set were organized or classified. This method of organizing narrative text in data reduction was referred to as the editing analysis style of qualitative analysis (Loiselle, Profetto-McGrath, Polit & Beck, 2011).

In this secondary analysis, the narratives of homeless people were analysed for the sole purpose of uncovering data bits or elements that described health. For example, the phrase "eat regular" is a data bit. Using the constant comparative method of data reduction, the fit of this data bit was compared to other data bits in the data set. For example, in interview 1 the respondent related "eat regular", interview 6, "eating the regular meals", interview 9, "I don't like missin' [sic] a meal", and interview 14, "eating a steady diet and regular meal

hours". These data bits and others were reduced to item 005, 'In the past two weeks did you have a steady diet with regular meal hours?'.

During data reduction, preservation of verbatim language was reserved for item writing. Other researchers had used this approach of preserving verbatim language when generating items for the item pool so that meaning and clarity in items was improved for future respondents (Fleury, 1993; Hall & May, 2001; Hilton, Budgen, Molzahn & Attridge, 2001; Imle & Atwood, 1988; Phillips, Brewer & Torres de Ardon, 2001; Tilden, et al., 1990). In an effort to capture the essence of meaning, the qualitative data bits were reduced into subcategories prior to item writing using the sorting technique where similar data bits were sorted into subcategories (Atwood & Hinds, 1986). All data bits within a subcategory were compared so that shared meaning of data bits within that subcategory were transposed into items that reflected the respondents' experiences of health. In this way, data bits were transformed into items and through further reductions into categories or health determinants. This process of data reduction guided the development of the item pool and the theoretical definitions for this study. This approach to item construction supported qualitative validation (Hall & May; Hilton, et al.).

Interrater reliability. An independent assessor agreed to conduct a review of the open coding. The procedure for this assessment directed the assessor to 1) read the interview to gain an understanding of the experience of health held by that respondent, 2) review descriptive open codes that had emerged from this interview, 3) code the interview using the descriptive codes, and 4) contact the researcher if clarification was required. The interrater review was conducted independently and clarification was not required.

The fit of categories and subcategories with the data was assessed using the interrater agreement technique of occurrence percentage agreement and kappa (Baer, 1977; Hartmann, 1977; House, House & Campbell, 1981; Topf, 1986). Occurrence percentage agreement was selected because the intent of this procedure was to ascertain the percentage of time independent raters agree that data bits fit a particular subcategory (Topf). Kappa was selected because

occurrence percentage agreement does not control for agreement due to chance. Kappa, however, is sensitive to the prevalence of the characteristics being assessed and is difficult to interpret when there is high agreement between raters; making one cell of a 2 x 2 matrix more heavily loaded (Brennan & Hays, 1992; Waltz, et al., 2005). In that situation, kappa can be divided by kappa max to determine interrater agreement or the consistency between raters (Waltz, et al.). Reporting both methods of reliability attended to the actual agreement among raters and the agreement beyond chance alone.

Stage 2: Item Interpretability

The purpose of item interpretability was to develop item or question clarity and to maximize shared meaning. To achieve this end, an item clarity assessment was developed and conducted. Borrowing and modifying the procedures developed by Imle and Atwood (1988), response sheets were designed so that each of the eight item sets contained at least one item from each health determinant. (See figure B1 in appendix B.) After data reduction in Stage 1, eight was the smallest number of items contained within a category or determinant. Item sets A, B, C, and D each contained 34 items, and E, F, G, and H each contained 33 items for a total of 268 items. Respondents were asked to respond to the item sets in the order presented. Because of the large number of items and concern for response burden, item sets were presented in eight different orders. Each set of items was presented to every eighth respondent first. Each Clarity Assessment Package contained a letter describing the assessment procedure, instructions to complete the assessment, and eight item sets.

Respondents were instructed to rate each item as Clear or Unclear and to examine all items rated unclear for ambiguity, professional jargon, value laden words, redundancy, and double barrelled nature of items (DeVellis, 2003; Grant & Davis, 1997; Netemeyer, Bearden & Sharma, 2003; Streiner & Norman, 2008). Items were listed on the left side of the page and respondents rated each item and wrote comments on the right side of the page. Although respondents were invited to comment on any item, comments on unclear items were encouraged. (See table B1 in appendix B for analysis guidelines.) To ease interpretation, occurrence

percentage agreement was calculated for each item. All feedback was considered and all items identified as having potential problems were reviewed, and rewritten or deleted from the item pool.

In the Fall of 2006, an undergraduate nursing research class at the University of New Brunswick was invited to participate in this aspect of the study. Although the target population was 52 students, approximately 30 students were in class when the invitation to participate was offered. After using a power point presentation to explain the study and highlight ethical considerations, questions regarding the study were answered, contents of the Clarity Assessment Package were described, and instructions were reviewed. To ensure anonymity, Clarity Assessment Packages were distributed to student participants by a research assistant after faculty had left the classroom and were returned to a departmental secretary. Twenty packages were distributed and 10 returned.

Stage 3: Scale Construction

The purpose of scale construction included developing scaling methods and instructions for rating items, selecting response categories, and drafting the physical layout of the scale. Monette, Sullivan, and DeJong (1990) defined a scale as "a number of items that are combined to form a composite score on a variable" (p.366). Each item assessed one idea or one aspect of the whole and items are presented in short (12 words or less) straightforward questions to avoid misinterpretation (Boynton & Greenhalgh, 2004; Netemeyer, et al., 2003; Streiner & Norman, 2008). Items in this scale are presented in short descriptive questions with the stem 'In the past two weeks did you'. Questions contained nouns, used the active voice, and avoided abstract ideas (Wagner et al., 1998). Because the scale was designed so that it could be self administered, every effort to make the multi-item scale parsimonious would be considered.

Because the concept of health is multidimensional, several health dimensions or determinants were identified during item generation, assessed during content validation procedures, and later confirmed during factor analysis. In order to gain insight into the influence these health determinants may have on the health of homeless people, items describing each determinant are summed to

indicate the respondent's health within that determinant and the totals of all sub-scales are summed to indicate the respondent's overall health. In summated rating scales, the score is calculated by adding responses in a specific scoring format where a higher score indicates a higher level of the concept being measured (Baily, 1987).

Scale Format: Direct Estimation

The health scales examined during the literature review indicated both diversity and complexity in response categories. An adjectival discrete scale ranging from 1 to 5 was selected for this measure. Measurement precision increased with the number of response labels up to and including five choices (Lissitz & Green, 1975) and when a number of items were summed to create a composite score, a five choice response category captured significant information (Streiner & Norman, 2008). Using the content-parallel format, respondents were asked to judge each situation and circle 1 for none of the time, circle 2 for a little of the time, circle 3 for some of the time, circle 4 for most of the time, and circle 5 if the situation is true all of the time. (See figure C3 in appendix C.) The numerical labelling of response choices defined equal distances between each semantic response label (Frisbie & Brandenburg, 1979; Keller, et al., 1998; Ramsay, 1973; Schwarz, Knauper, Hippler, Noelle-Neumann & Clark, 1991; Streiner & Norman; Wildt & Mazis, 1978) while defining scale points led to interpretation among respondents being enhanced, equivalency being advanced, and reliability improved (Frisbie & Brandenburg; Ramsay; Schwarz, et al.; Wildt & Mazis). As well, a 5 point scale was within the range of recommended levels of 7 plus/minus 2 categories for maximum reliability and cognitive processing (Keller, et al.; Miller, 1956; Ramsay; Schwarz, et al.; Streiner & Norman). For this measure, respondents were asked to make judgements using a scale that has increasing frequency and is representative of a hypothetical continuum from "none of the time" to "all of the time".

The response category described above is used in Version 2.0 of the SF-36 (Short-Form - 36 of the Medical Outcome Study). The Version 2.0 response category was modified to address evidence that one of the labels in the original

scale, Version 1.0, did not have interval properties. In testing the equivalence of the original SF-36 response choice labels across 13 countries including Canada, the ordinal properties of the response choice scale were confirmed but the response choice, "a good bit of the time", did not demonstrate "quasi- interval" properties. When mean ratings for the proposed response labels were averaged across, and within, countries, "the distance between most of the time and a good bit of the time was much less than 1" (Keller, et al., 1998, p. 938). Another study evaluated the translation of the SF-36 response category across eight countries including Canada and found that the response category described above had a mean difficulty rating between 8.4 to 30 on a scale of 0 to 100 with 0 being not at all difficult and 100 being most difficult. All labels in the proposed response category received a difficulty score below the 75th percentile, a score below 25, except the response label, a good bit of the time (Bullinger et al., 1998). In that same study, the quality ratings (clarity, common language, and conceptual equivalence) for this response category ranged from 93.6 to 97.1 where 100 represented the highest quality. The results from these studies demonstrated cultural equivalence in English Canada and acceptance for all response options except "a good bit of the time". This response option has been removed from Version 2.0 of the SF-36. Because the 5 point response category for Version 2 was deemed appropriate for use in heterogeneous populations in English Canada (Bullinger et al.) and at an acceptable scale level for continuous distributive variables assumed to be at an interval level of measurement (Borgatta & Bohrnstedt, 1981; Munroe, 2005; Newton & Rudestam, 1999), this response category was selected for this new scale.

The use of positive numerical values in a unipolar scale structure suggested that the researcher was interested in the degree to which an attribute/situation was present while bipolar scales, or the use of negative and positive numerical values, suggested that the researcher was interested in the degree to which the attribute was present or absent (Schwarz, et al., 1991). Furthermore, studies confirmed that bipolar scales had a strong positive skew while unipolar scales tended to demonstrate variability, or symmetry, that was

aligned more closely with a normal distribution (Frisbie & Brandenburg, 1979; Schwarz, et al.; Streiner & Norman, 2008; Wildt & Mazis, 1978). Bipolar scales or negative numeric labels suggested that the item being measured was absent, making the degree to which the attribute being measured was not present a moot point for respondents. Because health, a positive concept, was the attribute of interest, a unipolar scale is more likely to represent the increasing intensity in which the item or aspect of health was experienced.

Stage 4: Content Validation

Assessments of content validation were conducted with two different expert groups; homeless people, and nurse clinicians or researchers who provided health care or conducted research within this population. The focus of these assessments was different for each expert group. Homeless people assessed clarity and acceptance. Nurse experts rated the degree to which scale items reflected conceptual meaning and assessed whether identified domains represented the construct being operationalized. Tests of content validation with homeless persons were conducted in Saint John, New Brunswick in the summer of 2007 and content validation with nurse experts from New Brunswick and Ontario were conducted from the summer of 2007 to the winter of 2008.

Content validation was determined using a modified quantification process, the content validity index (CVI) (Grant & Davis, 1997; Lynn, 1986; Streiner & Norman, 2008; Wynd & Schaefer, 2002). Using the standard error of the proportion and setting the level of significance at 0.05, Lynn developed a table to indicate the proportion of experts who needed to agree in order for the assessment to be considered content valid. Because a minimum of five experts is suggested in order to control for chance agreement and an upper level of ten experts is considered acceptable, the aim was to recruit ten experts with a minimum of six from each expert group; recognizing that confidence in the CVI increases with the number of assessors. As well, increasing the number of assessors beyond five made possible the detection of outliers (Hayes, Richard & Kubany, 1995). In total 10 homeless people and eight expert nurses completed content validity assessments. Using the table developed by Lynn, in order to

control for chance agreement in the homeless expert group, eight experts or 80% needed to agree that the item was important. While in the nurse expert group, a minimum of 7 assessors or 88 % needed to agree that the item was relevant in order for an item to be considered content valid.

Congruency of item sets was assessed using the 4-point Likert scale proposed by Lynn (1986) where for homeless experts 1 indicated not important, 2 somewhat important, 3 important, and 4 very important; and for nurse experts 1 indicated not relevant, 2 relevant but requires major revisions, 3 relevant but requires minor revisions, and 4 relevant. As well, homeless experts were asked to rate items as clear or unclear and space was provided for data collectors to record comments. (See figure C2 in appendix C.) Nurse experts were directed to comment on the uniqueness of the item and again space was provided for them to explain ratings. (See figure D1 in appendix D.)

The CVI for each item was derived by calculating occurrence agreement for items rated in each of the ordinal categories. The minimum acceptable content validity index for a new instrument is 0.80 (Davis, 1992; Fleury, 1993). All items rated 3 or 4 with 80% agreement were considered content valid and retained. Items rated 1 with 80% agreement were dropped. Because suggestions for item improvement does not interfere with the CVI rating (Lynn, 1986), any item rated 2 or 3 by an expert and all items rated 1 by one expert were examined for modification. If items were substantially modified, the item was presented to the clinical and research nurse experts for reassessment in assessment 2 when suggested new items were assessed. Because the time between assessments was greater than 14 days, using the same assessors is deemed appropriate (Lynn). If successfully modified, the item was retained. If suggested improvement remained unacceptable, the item was dropped. Because follow-up with homeless clients is rarely possible, homeless respondents were not involved in a second assessment.

Acceptability: Content/Cultural Validation with Target Population- Homeless Experts

When developing a new subjective health status measure for a particular sector of society, acceptance of items by the target population, or cultural

validation, was recommended (Fleury, 1993; Hayes, et al., 1995; Imle & Atwood, 1988; Solano-Flores & Nelson-Barber, 2001; Tilden, et. al., 1990). For self assessment measures where rating was completed independently, or in this situation, with the help of another person, maximizing shared meaning was sought so that items were self explanatory and clearly understood (Thomas, Hathaway & Arheart, 1992). Because the sociocultural environment influenced how information was shared, what type of knowledge was valued, and how meaning was constructed (Corless, Nicholas & Nokes, 2001; Solano-Flores & Nelson-Barber), homeless people in Saint John, New Brunswick were recruited to assess the degree of shared meaning understood by respondents and researcher.

The purpose for this content validation was to assess shared meaning by asking homeless respondents to judge acceptability, clarity, and appropriateness of items selected to represent health, to assess instructions for rating items, to rate selected items so that adequacy of response categories and the physical layout of the scale could be assessed, and to judge whether or not groups of items fitted together in a particular domain or health determinant (Atwood & Hinds, 1986; Fleury, 1993; Hawranik, 2000; Imle & Atwood, 1988; Whiteley, Kristjanson, Degner, Yanofsky & Mueller, 1999). Items with high acceptability had been found to improve accuracy in test completion and to increase response rates in the quantitative testing of psychometric properties (Thomas, et al., 1992). The sorting of items into domains facilitated the development of scale structure and provided beginning evidence of adequate domain sampling (Kristjanson, Atwood & Degner, 1995).

In instrument development, key informant interviews had been accepted as an appropriate method to appraise readability, comprehension, and clarity in wording, and to assess appeal or acceptance of the physical layout of an instrument (Imle & Atwood, 1988; Mahoney, Thomas & Howe, 1995; Netemeyer, et al., 2003; Staniszewska, et al., 1999; Streiner & Norman, 2008). In the summer of 2007, ten homeless people who spoke English and lived in New Brunswick participated in this assessment. Respondents were encouraged to talk aloud as they completed the various tasks. All dialogue was tape recorded, and written and

transcribed data were used to improve acceptance and clarity. The assessments conducted by these key informants were divided into four sequential exercises; acceptance and clarity of instructions, acceptance and clarity of items, clarity in response categories and appropriateness of physical layout, and domain sorting.

Acceptance and clarity of instructions. Borrowing from the procedures developed by Imle and Atwood (1988), each respondent was read the instructions for assessing items. (See figure C1 in appendix C.) Respondents were asked to rate the instructions as clear or unclear, and to verbally share their comments with the data collector who recorded the respondents comments in their presence.

Acceptance and clarity of items. The next procedure assessed acceptance of, and clarity in, the wording of items. To avoid overwhelming raters, items were divided into sets (Imle & Atwood, 1988). Each of the seven item sets contained items from each of the health determinants that emerged in the secondary analysis. (See figure C2 in appendix C.) After item interpretability in Stage 2, seven was the smallest number of items contained within a category or determinant. Items were placed into sets sequentially with each set containing 35 items for a total of 245 items. Although respondents had the opportunity to rate all item sets, one set was completed before proceeding to the next set. All items were read aloud to respondents. Because the item pool was large and the researcher was concerned about respondent fatigue, sets were rotated to ensure each set had the opportunity to be assessed at the beginning of an interview. After assessing items using a 4-point Likert scale where 1 indicated not important, 2 somewhat important, 3 important, and 4 very important, acceptance was determined by calculating the CVI for each item. Clarity in wording was assessed using the categorical scale of clear or unclear.

Clarity in response categories and physical layout. In the third step of this multi task interview, respondents were asked to rate selected items in order to test the range and logical fit of phrase anchors selected for response categories and the physical layout of scale items. (See figure C3 in appendix C.) After rating these items, a focussed discussion about the adequacy and clarity of the response options was facilitated. Finally, the physical layout of the scale was discussed. All

feedback was recorded in the presence of the respondent and considered during scale modification.

     Domain sorting. Borrowing from the procedures developed by Imle and Atwood (1988), sets of items were assessed once again. During this procedure, item sets contained only items that were clustered in the same domain or health determinant that emerged during secondary analysis. (See figure C4 in appendix C.) Space for data collectors to write any suggested changes in item sets or sorting decisions was provided. Again, respondents were encouraged to talk aloud as decisions were made. Finally these respondents were asked to assess whether item sets described their experiences of health.

Relevance and Coverage of Item Sets: Content Validation with Nurse Experts

     Tests of content validation provided supporting evidence for the content relevance of each item and the content coverage for the entire instrument (Fleury, 1993; Grant & Davis, 1997; Greenfield, Kuhn & Wojtys, 1998; Imle & Atwood, 1988; Lynn, 1986; Streiner & Norman, 2008; Tilden et al, 1990; Whitely et al, 1999; Wynd, Schmidt & Schaefer, 2003). The purpose for this assessment of content validation included assessing the fit between the theoretical definition for the domain/health determinant and the corresponding domain/health determinant label, the relevancy of items within each domain/health determinant and assessing that relevant dimensions of the domain/health determinant were included or identifying omissions, and rating items in terms of their unique contribution to the health determinant being measured (Fleury; Imle & Atwood; Lynn). In order to have confidence that items or empirical indicators were congruent with the construct, content validation was considered an indispensable procedure in the development of a new instrument (Berk, 1990; Grant & Davis; Lynn; Slocumb & Cole, 1991; Wynd et al.). According to Thomas and colleagues (1992), items with higher relevancy have higher criterion-related validation and higher predictive validation.

     From the summer of 2007 to the winter of 2008, items were assessed by eight nurses who either offered health services to homeless individuals or conducted research within this population. These nurses were selected as experts

because of their knowledge about this population (Berk, 1990; Davis, 1992; Grant & Davis, 1997; Wynd & Schaefer, 2002), and to ensure theoretical congruency, at least five of the experts were enrolled or had completed a degree at the master and/or doctoral levels. Because experts from different geographic locations increased the likelihood of identifying colloquialisms (Grant & Davis), expert nurses from Toronto, and from Fredericton and Saint John in New Brunswick participated.

Assessment 1. Each expert received through e-mail an invitation to participate in the content validation of this new measure. The letter stated reasons for their selection and explained the importance of developing a self assessment health status measure for homeless people. Each expert who agreed to participate received through e-mail detailed instructions and the assessment tool developed for this procedure (Imle & Atwood, 1988; Lynn, 1986). This panel of experts were asked to independently respond to a paper and pen assessment. Experts assessed the congruency of domain label and definition using the categorical scale of yes/no, rated the fit of each item with the domain label using a 4 point scale from not relevant to relevant, and commented on the uniqueness of the item. (See figure D1 in appendix D.) The completed assessments were returned to the researcher for analysis.

Assessment 2. In order to assess additional new items and those items reworded to reflect the feedback provided in the first assessment, each nurse expert was e-mailed the identified questions. Using the same rating scale as in the first assessment, nurse experts rated the fit of each item with the domain label, and commented on the uniqueness of the item. After this assessment was analysed, the operational definition or new measure - McCormack Assessment Scale for the Health of Homeless Persons (MASHH) - was ready for psychometric testing and the structure of health for homeless people was more visible.

Stage 5: Psychometric Testing: A Pilot Study

Testing the McCormack Assessment Scale for the Health of Homeless Persons

While developing the theoretical and operational definitions, the health structure for homeless persons had been unfolding. The McCormack Assessment

Scale for the Health of Homeless Persons or MASHH was ready for testing in a pilot study, the next step in instrument development (DeVillis, 2003; Netemeyer, et al., 2003; Streiner & Norman, 2008). Initially, new scales are assessed for item performance using internal consistency procedures such as Cronbach's Alpha and validation of the initial structure of the construct of interest using confirmatory factor analysis. The purpose of this pilot study was to reduce the number of items to a more manageable number, and to further develop and refine MASHH by examining how each item contributed to reliability within subscales/determinants and testing the validation of the initial structure of health in confirmatory factor analysis. Although the quality of items is more important than quantity, a minimum of three items was required for each subscale (Netemeyer, et al.; Norman & Streiner, 2008). The ultimate goal of this pilot study was to refine MASHH further while continuing to develop a reliable parsimonious scale with beginning construct validation. Also, of interest in this pilot study was identifying any recruitment and training issues.

During the summer of 2008, MASHH was used to collect data from 168 homeless persons in three small cities in New Brunswick; Fredericton, Moncton, and Saint John. (See map of New Brunswick in appendix E.) After data were coded and entered into SPSS software (Version 17), psychometric testing procedures used to calculate coefficient alphas for each subscale/determinant and confirmatory factor analysis procedures used to gain insight into item performance and the health structure were applied to the data.

Data Preparation

In preparing pilot data for analysis four criteria were considered sequentially. Qualitative data or feedback from respondents recorded during data collection was analyzed. Any questions or items that elicited any response (question or comment) from respondents were identified. All items that raised concerns for greater than 5% or eight of the respondents were examined. Descriptive statistics or the frequency distribution of response label endorsement was generated and appraised. The bivariate correlation matrix presenting the linear relationship between items was examined for both low correlations (.30)

and high correlations (>.80). Finally, items were examined for scoring procedures. In preparation for examining item reliability estimates, any item requiring reverse scoring was reversed (DeVillis, 2003; Field, 2008). In considering items for reverse scoring, the summative meaning of items unfolded.

Analysis Procedure

After developing the code book and entering the data into a computer software package, data were analyzed using an iterative process. To begin, items in each subscale/determinant in the health structure developed and refined in Stages 1, 2, and 4 were entered into a reliability analysis with the intent of establishing that items within each subscale/determinant measured the same dimension of the construct health. This series of reliability analyses generated Cronbach's Alpha for each subscale/determinant, and the value of Cronbach's Alpha for each item in the subscale/determinant. Items within the subscale/ determinant were examined for their contribution to alpha. If Cronbach's Alpha for the subscale/determinant increased if a particular item was deleted, the performance of this same item in factor analysis was of particular interest.

After running reliability analyses for each subscale/determinant, confirmatory factor analysis using both orthogonal and oblique rotations was conducted. Only items loading with a critical value greater than .399 were retained in the rotated component matrix generated from the orthogonal rotation and the pattern matrix generated from the oblique rotation. The critical value of .399 for the factor loading was calculated at the 0.01 level of significance using the formula designed for samples greater than 100,

$$CV = \frac{5.152}{\sqrt{N-2}}$$ (Norman & Streiner, 2008, p. 205).

In round one of this iterative process, all items causing a substantial decrease in Cronbach's alpha for the subscale/determinant were checked against factors extracted in both rotations of confirmatory factor analysis. If an item caused a substantial decrease in Cronbach's alpha in the expected subscale/ determinant and had not loaded on a factor, the item was removed or if the item had a higher loading on another factor/determinant that made conceptual sense,

the item was moved to that factor/determinant for further reliability analysis. In rounds 2 and 3, this iterative process continued but an item was removed if causing a decrease in Cronbach's alpha for the subscale/determinant and/or not loading on a factor. In round 4 of this iterative process, an item was removed if the item increased marginally Cronbach's alpha for the subscale/determinant and did not load on a factor. In round 5 of this iterative process no items were removed. After five rounds, Cronbach's alpha for MASHH was reliable at greater than .70; indicating acceptable reliability for a new scale (Dennis & Faux, 1992; Summers, 1993; Ware & Gandek, 1998) and factors contained items that fitted conceptually.

Study Population

Data to develop and test the new scale with homeless persons were collected in three small cities in southern New Brunswick; Fredericton, Moncton, and Saint John. (See map of New Brunswick in appendix E.) Data from the first report card on homelessness in New Brunswick (Homelessness Partnering Strategy, 2009) was used to gain a rough estimate of the percentage of homeless persons in each city – the number of individuals who stayed in shelter beds was compared to the population for that city according to the 2006 census data. In 2008, 485 persons stayed in shelters in Fredericton or approximately 1% of the population, 725 in Moncton or approximately .5 % of the population, and approximately 1160 in Saint John or 1% of the population.

The data collection strategy used in Saint John was different from that used in Moncton and Fredericton. Because data collectors were required to travel from Saint John to Fredericton and Moncton, a consistent day of the week was chosen for conducting interviews in those cities. This information became known among homeless people and data collectors were expected in that city on a particular day of the week. Because there was no need to travel to Saint John, data collection days and time was more flexible. In Saint John, either shelters were contacted and inquires made about the availability of potential respondents or shelter directors contacted the designated data collector. Access to shelter settings, soup kitchens, and street nurse clinics were successful in all three cities.

Inclusion/Exclusion Criteria

People were invited to participate in this study if the following criteria were satisfied:

1) had no known address, gave a shelter for homeless people as an address, identified a squatter tenement as their living environment, or gave a friend's address as their address;

2) spoke and read English;

3) was at least 16 years of age, the age at which parental consent is no longer required for medical treatment (Government of New Brunswick, 2002); and

4) demonstrated an ability to articulate ideas and a willingness to share those ideas with others.

Sampling Procedures

The sampling framework for this study is based on nonprobability convenience sample methods. In Stage 2, item interpretability, undergraduate nursing research students at the University of New Brunswick in Saint John and in Stage 4, content validation, homeless people in Saint John and nurse experts in New Brunswick and Toronto, the purposeful sampling technique was employed. In Stage 5, the pilot test, the quota sampling technique was used to access a sample of homeless persons in Fredericton, Moncton, and Saint John in New Brunswick.

Purposeful Sampling Technique

In Stage 2, item interpretability, access to an undergraduate nursing class was gained and a convenience sample of 10 students participated in the item clarity assessment, although five students were the minimum number of respondents needed to control for chance agreement (Lynn, 1986), 10 or more respondents were preferred. In Stage 4, content validation, eight nurse experts participated in the assessment of relevance and coverage of item sets.

Also, in Stage 4, a convenience sample of 10 homeless persons who met the inclusion criteria for this study participated in key informant interviews. After acquiring consent, respondents were invited to go to a coffee shop for a meal

while completing the content validation procedures. However, all respondents preferred to stay at the shelter or go to a park and keep the gift card valued at $10.00 to use at a time of their own choosing. Even though the compensation to partake in a meal at a venue frequented by New Brunswickers across all socio economic levels was not revealed until consent was acquired, this practice became common knowledge on the street. In order to keep communication open, street nurses and other frontline workers were informed that research interviews were being conducted, a remuneration of a $10.00 food card was being offered, and the data collection period being anticipated.

All interviews with homeless persons were conducted in a private area within a shelter or outside sitting on a bench in a park. At all times the privacy of respondents was respected while upholding a naturalistic perspective of respondents' contextual environment. A respondent profile was maintained and an effort was made to recruit respondents from diverse age groups with representation from both genders.

Quota Sampling Technique

Homeless persons who lived in Fredericton, Moncton, and Saint John in New Brunswick and who satisfied the inclusion criteria for this study were invited to participate. Even though a convenience sample of respondents was sought, the demographic profile of respondents was monitored; gender, age, and living situation. This strategy was employed to include a range of ages and to prevent the under representation of women and those who did not seek protection from the elements in shelters. In order to access the harder to reach homeless clients who tend to live in squats or in parks, the snowball strategy of having respondents recommend other respondents was employed (Morse, 1986).

Having learned from homeless respondents in the previous sample in Stage 4, all interviews were conducted in a private area within a shelter, on a bench in the park, or sitting on the curb or lawn in front of the shelter. After acquiring consent and completing the interview, respondents were offered a $10.00 food card from McDonalds or Tim Hortons or Sobeys. If the respondent found another person who did not have an address and was interested in

participating in the study, a second food card could be earned. In order to acquire another food card, respondents introduced the potential respondent to the data collector and after the study was explained and ethical consent acquired, the homeless recruiter witnessed the signature of the new respondent.

Again, in order to keep communication open, street nurses and other frontline workers were informed that research interviews were being conducted, food cards were being offered, and the data collection period being anticipated.

Research Setting

New Brunswick has four small primarily English speaking cities with developed resources and services for citizens who live in them and in the multiple rural communities that surround them. For the first time in 2009, New Brunswick issued a report card on homelessness which included information for all three cities where data were collected in this pilot study. Although Saint John is included in that report card, a more detailed report card on homelessness in Saint John was issued also in 2009.

According to the *The First Report Card on Homelessness in New Brunswick* (Homelessness Partnering Strategy, 2009), Fredericton with a population of 50,535 has separate shelters for men (40 beds) and women (9 beds) but one Board of Directors for both, and a residence for homeless teenage girls. Moncton with a population of 126,424 has two shelters: The House of Nazareth managed by a Board of Directors has 30 beds of which 24 are designated for men and four designated for women, and two on reserve for families, women, or men as the need dictates. Harvest House, a Christian overnight homeless shelter, provides 30 mats for men and women who must attend a nightly fellowship meeting. Saint John with a population of 122,389 had three overnight shelters for homeless people when these data were collected in the summer of 2008: Gateway to Hope, a shelter for women and their children (15 beds), closed in the Spring of 2009 due to lack of funding. Coverdale Emergency Wet Shelter for women has 10 beds. The Salvation Army Booth Centre, a religious and charitable organization, has 79 beds for homeless men. All the above shelters granted access for this pilot

study. As expected, many of the patrons were from rural communities or had their roots in rural communities.

Data Collection Techniques

Homeless persons were invited to participate in this study after securing their bed for the night in the shelter, completing their meal at the soup kitchen, or obtaining any other necessary resource the homeless person might be attempting to access. In some situations, data collectors were ethically obligated to appropriately refer respondents to available resources. These referrals were done after data were collected.

In the first phase of the study, two outreach nurses who provided health services to homeless persons and staff who worked in either a shelter or soup kitchen environments introduced the data collector to potential key informants. Being introduced by service providers who are known and respected by homeless persons had facilitated recruitment in previous studies in this population (McCormack & Gooding, 1993; McCormack & MacIntosh, 2001). After being introduced the study was explained and consent obtained prior to conducting the taped interview.

In the second phase of the study, recruitment of respondents was facilitated by employing two undergraduate nursing students as data collectors. Both data collectors were trained to facilitate procedure consistency and to increase understanding about the purpose of the study. Both data collectors were observed during a mock interview and feedback provided on their interview technique. Data were collected using the paper and pencil format in a face to face interview. After securing consent, data collectors opened a manila envelope and completed with the respondent the self-report instruments. During key informant interviews homeless respondents held a laminated 21 ½ by 14 centimeters blue card with the response categories from 1 to 5 clearly defined from none of the time to all of the time. This strategy was used so that memory did not influence data quality (Streiner & Norman, 2008). Data collectors made certain that respondents could see the number circled in the MASHH booklet.

After each interview, data collectors wrote comments about questions asked by respondents in relation to the items in MASHH, noted the attentiveness of respondents, and briefly described the environmental context and any unusual occurring events in the research setting. Generally, the researcher and student data collectors travelled to different cities in the same car allowing time for debriefing, answering questions, and discussing events occurring in the research setting. At the end of data collection all research notes were returned to the researcher for analysis.

Ethical Considerations

Risks and Benefits

Homeless people expend tremendous energy in daily survival (McCormack & Gooding, 1993; McCormack & MacIntosh, 2001). In order to respect this aspect of their living situation, data were collected when respondents were not in the process of satisfying basic human needs such as obtaining shelter and/or food, or not at eminent risk to a health challenge for which they were seeking help. Because the daily activities that influence survival were not interrupted, respondents were not subjected to any known risks.

A potential intangible benefit occurred when respondents gained a sense of satisfaction from having had the opportunity to have their opinions regarding health considered. As in other studies, respondents expressed gratitude for the opportunity to be heard (Averitt, 2003; McCormack & Gooding, 1993; McCormack & MacIntosh, 2001). A tangible benefit occurred when respondents received a $10.00 food card for participating in the study or for recruiting new respondents. Also, data collectors referred some respondents to community resources such as a local health clinic that was previously unknown to them. A future benefit is the development of a reliable and valid tool to assess future health status.

Informed Consent

The researcher or data collectors explained the study to potential respondents. Respondents were informed about the purpose of the study, methods used to collect data, the average time needed to complete the required activity,

management of data collected including issues of confidentiality and anonymity, and their right to withdraw from the study at any time. Respondents were informed that their participation in this study was voluntary and had no influence on their access to available services. All questions and concerns of respondents were addressed before proceeding with the signing of the consent form. (See appendix F.) This research received ethical approval from the McGill Ethics Institutional Review Board and the Review Ethics Board at the University of New Brunswick.

All consent forms were number coded and all corresponding documents completed by respondents had the corresponding number code. In front of respondents, data collectors placed signed consent forms and data collected in separate sealed envelopes. All sealed envelopes were hand delivered to the researcher. All signed consent forms and data were secured in separate locked file cabinets accessible to the researcher only. In order to facilitate dialogue during the taped interviews in Stage 4, respondents were invited to use a pseudonym. However, respondents preferred to use their names. Taped interviews were destroyed at the end of the analysis in Stage 4.

Chapter 4

Results

The design of this study laid the foundation for sequential data analysis. Data collected in one stage of the research were analyzed prior to proceeding to the next stage. Because each stage of the design yielded results that informed the next stage, results are presented using the research design blueprint. (See page 22.) Because new insights about collecting data in public settings and recruiting homeless respondents into research studies were gained, the knowledge acquired about the research setting is discussed.

The theoretical definition of health for homeless people was developed in Stage 1, Item Generation. The operational definition, or the new health measure MASHH - The McCormack Assessment Scale of Health for Homeless Persons - was developed in four sequential stages: 1) Item Generation, 2) Item Interpretability, 3) Scale Construction, and 4) Content Validation. Analysis in these stages of the research study utilized the constant comparative method of qualitative analysis (Field & Morse, 1985: Thorne, 2000; Turkel & Ray, 2001) and a modified quantification process, the content validity index (CVI) (Grant & Davis, 1997; Lynn, 1986; Streiner & Norman, 2008; Wynd & Schaefer, 2002). In Stage 5, the Pilot Study, the operational definition is refined further using psychometric procedures of reliability and confirmatory factor analysis (DeVillis, 2003; Netemeyer, et al., 2003; Streiner & Norman; Norman & Streiner, 2008).

Stage 1: Item Generation

In this stage, the aim was to develop a substantial item pool that described the health experiences of homeless persons and to derive inductively the theoretical definition for MASHH. A comprehensive item pool was considered necessary in the development of this new instrument (DeVillis, 2003; Ferketich, 1991; Netemeyer, et al., 2003; Streiner & Norman, 2008). An unexpected high number of descriptive codes or codes that remain close to the words used by participants that have potential to be converted into items were uncovered during the secondary analysis. Through a succession of data reductions, descriptive codes were compared and shared meaning transposed into categories. Descriptive codes

were later transposed into items and categories into health determinants. The items remaining at the end of this stage informed the development of the theoretical definition for this study.

Constant Comparative Method

Analysis of secondary data yielded 254 descriptive codes. Some codes were strong and were repeated in several interviews, while others were declared less than 5 times with some being identified only once. (See table G1 in appendix G.) For example, the descriptive codes that emerged from the interview coded P1 were compared with the descriptive codes in all other interviews. Descriptive codes included, for example, such things as getting all your vitamins, getting enough sleep, eating food from each of the food groups, and not having any illness complaints. When descriptive codes from subsequent interviews were well-matched with the codes in interview P1, the number code for that interview appears after the descriptive code generated in interview P1. In interview P2, descriptive codes related to addiction status and social health were identified. These codes did not appear in interview P1. Codes included such items as not/ stop smoking, not/stop drinking alcohol, not taking drugs or staying clean, being able to go out on a date, and being with people. This process continued with all 40 interviews. Only two interviews did not generate new descriptive codes. After analyzing all data in the combined data set, only 28 descriptive codes emerged from the data set in the second study conducted (McCormack & MacIntosh, 2001). Even before descriptive coding was complete, health determinants began to unfold. For example, food security, housing, work, and not being sick were evident throughout the narratives.

Data reduction 1. In data reduction 1, categories were generated from the descriptive codes of data bits. In this analysis descriptive codes were clustered/ categorized or reduced to 43 descriptive categories. (See table H1 in appendix H.) The words used to describe these categories mirrored the words used by respondents and were used to organize or classify data bits into descriptive categories; reflecting the number of themes that emerged from the clustering of descriptive codes (Burns & Grove, 2005). In this way, the data were classified and

reduced. For example in P1 the descriptive codes were reduced to six descriptive categories. (See table H1 in appendix H.) Only two new categories, staying away from trouble and hope, emerged from the second study conducted (McCormack & MacIntosh, 2001). This finding coupled with the large number of descriptive categories suggested that the range and dimensionality of the experience of health within the context of being homeless was being captured. Although, at this point in the analysis, some categories were signifying completeness and uniqueness, others were suggesting the potential to be collapsed with other categories. For example, the connection between the categories of intellectual health and mental health was recognized. The internal structure of the construct of health for homeless people was not yet revealed.

Data reduction 2. In data reduction 2, descriptive codes were placed within each category using the sorting technique (Atwood & Hinds, 1986). Descriptive codes from the two categories that emerged from the second study conducted (McCormack & MacIntosh, 2001) were sorted into other categories. Descriptive codes in the category, staying away from trouble, were sorted into the category of social health; and descriptive codes in the category of hope were sorted into the category of street survival skills. Other categories were collapsed. For example, intellectual health and mental health categories mentioned earlier were collapsed into mental health. Because the last category to emerge was from interview 14 of the 40 interviews conducted, confidence that the construct had good coverage was building. At the end of this data reduction all descriptive codes had been sorted into 28 categories. (See table H1 in appendix H.) However, the number of descriptive codes increased to 372. The main reason for this increase in codes was attributed to the double-barreled nature of some descriptive codes in that two or more ideas were contained within the same code (DeVellis, 2003; Netemeyer, et al., 2003; Streiner & Norman, 2008). For example, in interview P1 (See table G1 in appendix G.), the descriptive code of standing on your own two feet & not having illness-related complaints, not being sick, and not having a disability was recoded into three separate codes of not having illness-related complaints, not being sick, and not having a disability. The idea or pattern of Not Being Sick gave

interpretative meaning to these descriptive codes. In this sense, the descriptive nature of the codes was maintained but the interpretative nature of the category was unfolding (Burns & Grove, 2005). Recognition of the determinants shaping the internal structure of health for homeless people was further developed but remained undefined.

Data reduction 3. In data reduction 3, each descriptive code within a category or determinant was examined for shared meaning and codes were transposed into items**.** Guidelines for item writing stated that each item contains only one idea, is short [12 words or less] (Boynton & Greenhalgh, 2004; Netemeyer, et al.,2003; Norman & Streiner, 2008), contains nouns, uses the active voice (Wagner et al., 1998), and preserves verbatim language (Fleury, 1993; Hall & May, 2001; Hilton, et al., 2001; Imle & Atwood, 1988; Phillips, et al., 2001; Tilden, et al., 1990). When redundant descriptive codes were collapsed; 288 items had been prepared for appraisal. This reduction in codes during item writing also resulted in a reduction of categories/determinants to 23. (See table H2 in appendix H.) Because factors with three or less items have lower mean alpha coefficients than those with more than three items (Netemeyer et al.), when determinants/ factors had three or less items, items were moved to another determinant and the original determinant deleted or merged (Netemeyer, et al.; Norman & Streiner). Further to this, determinants were compared to assess unique contribution to health. Because the last category to emerge, spiritual health, was from interview 11 and no new categories/determinants had emerged in the additional 29 interviews, saturation of categories/determinants had been achieved. Therefore, the construct of health emerging from the secondary analysis was likely to have good coverage in that items within each category/determinant had an additional 29 interviews to capture the full range of diversity within that category/determinant. Although description was retained in items, determinants were raised to an explanatory level. These categories were delineating the determinants that explained health experiences for homeless persons; connecting data to the unfolding theoretical construct of health (Burns & Grove, 2005).

Data reduction 4. In data reduction 4, each item and category/ determinant was examined for uniqueness. As observed differences between categories/determinants were discerned, the defining elements of specific items within the category/determinant became visible. This attention to uniqueness further reduced health determinants to 18 (See table H3 in appendix H.) Further examination of the 268 items within the context of the18 remaining categories/ determinants supported the construction of category/determinant definitions that reflected ideas expressed by respondents. Ware (1987) suggested that when the distinction between dimensions of health was observed, the measure was comprehensive. In other words as distinctions were made between categories/ determinants, the construct of health for homeless persons is recognized. At the end of this reduction the unique structure of the concept of health for homeless person was emerging. (See health structure in figure I1 in appendix I.)

Theoretical Definition

In preparation for content validation procedures, definitions were developed for each domain/determinant. More importantly, the theoretical definition for this study was derived. Health was conceptualized as a multidimensional concept influenced by health determinants that reflected the wholeness of living through multiple situational transitions while participating in health behaviors necessary for survival. A close watch or self maintenance enhanced experiences of health. In participants' words

> Being healthy is your mind being basically clear to face each day, To have basically what you feel is a comfortable home or a place to rest, Sufficient but not an abundant amount of food, …in the house show love and show respect for each other, and have friends that are good. (Interview 10, p.62)

> Health means [that you have] to be careful about yourself…[you] have to take care of yourself…you cannot depend on others…you have to know what is good for you. And avoid the bad things…and try to achieve the good things….You are responsible for your own health. (Interview 15, p.25)

Being healthy for me would be to get back up on my feet, get a job, stay clean, live in a healthier environment, [have] three meals a day for the rest of my life. (Interview 19, p.28)

[Health is] being in top shape, Everything is going well…you have a positive attitude….physically, you are getting nutrition so that you are not tired or sickly or dragged out or always running to see your doctor. (Interview 22, p.47)

Interrater Reliability

The occurrence percentage agreement or the percentage of time an independent assessor and the researcher agreed that a particular category fits the data bits was calculated using $\frac{A}{A+B+C}$ where A is the number of times raters used the same code, B is the number of times rater one used a code and rater two did not, and C is the number of times rater two used a code and rater one did not (Topf, 1986). The interrater reliability for this review using occurrence percentage agreement was calculated at 82%. Agreement of 80% is considered adequate (Topf). Although the occurrence percentage agreement attended to the actual agreement among raters, kappa was calculated to obtain the agreement beyond chance alone. Using the formula $K = \frac{P_o - P_c}{1 - P_c}$ where P_o is the observed agreement and P_c is the proportion of nonchance agreements (Waltz et al., 2005) kappa was calculated at .37. Because interpretation is difficult when one cell in a 2 x 2 matrix is more heavily loaded, Waltz and colleagues suggested calculating kappa max to determine the upper bound of kappa. Again, using the formula suggested by Waltz and colleagues $K_{max} = \frac{(A+C)+(C+D)-P_c}{1-P_c}$. Kappa max was calculated at .42. Further to these calculations, using the formula suggested by Waltz and colleagues the consistency among raters was determined by calculating $K/K_{max} =$ .90. The interrater reliability for this secondary analysis indicated high consistency among raters.

Stage 2: Item Interpretability

In this stage, the aim to maximize shared meaning through item or question clarity is realized. Ten undergraduate nursing students who were in year three of their Bachelor of Nursing program at the University of New Brunswick and enrolled in a research class completed the task of rating all items for clarity. Although only 10 students from a class of 52 participated, the explanation of the study and recruitment invitation to respondents occurred in the second half of a three hour class after the students had written a mid term exam.

To ease interpretation, occurrence percentage agreement was calculated for each item. Although the guidelines in table B1 in appendix B directed the analysis, some exceptions were made when current knowledge about the homeless population and ratings by student assessors were in strong disagreement. In those situations, the item remained in the scale for content validation. For example, the term "couch surfing" was rated clear by only three student respondents with most asking the meaning of a word used and accepted by homeless persons. This item was retained despite the low score when rated by undergraduate nursing students because student assessors were not familiar with jargon used by homeless persons.

The total number of items for assessment was 268 of which 30 items were deleted and seven items added. Eight items were deleted for ambiguity, 17 for redundancy, and five items for containing value-laden words. Seven items were added to ensure coverage. For example, in Food Security one item was added to capture the idea of not having any food, in Emotional Health, student assessors added the idea of feeling loved, in Addiction Status, four items were added to address ambiguity around substances used and the double barrel nature of other items pertaining to social support groups, and one item in Housing Security was added to address housing in tent cities or squats. A total of 18 determinants or domains and 245 items remained for testing in content validation. The health structure remained unchanged at the end of this analysis. (See health structure in figure I2 in appendix I.)

Stage 3: Scale Construction

The scale structure was assessed by content experts who are members of the homeless population in Stage 4 of this research study. During content validation, scale instructions, response categories, and the overall physical layout of the scale were assessed.

Stage 4: Content Validation

The aim to assess cultural validation or acceptability of MASHH with 10 homeless people was successful. However, the aim to assess relevance and coverage of item sets with 10 nurse clinical and research experts was more difficult. Despite extending the data collection period only eight nurse experts were recruited. Item reduction and refinement continued through content validation procedures and the structure of health for homeless persons was refined.

Content Validation with Target Population - Homeless Experts

Homeless persons assessed shared meaning or conducted cultural validation by judging acceptability, clarity, and appropriateness of items selected to represent health. Respondents assessed both instructions for rating items and each item, responded to a subset of items to assess the adequacy of response categories, and judged whether or not groups of items fitted together in a particular domain or health determinant (Atwood & Hinds, 1986; Fleury, 1993; Hawranik, 2000; Imle & Atwood, 1988; Whiteley, et al, 1999).

Sample. Ten homeless people who were accessing shelters (8), living rough (1), or living rough and couch surfing with friends (1) completed these assessments in a face to face interview. Respondents had been homeless for two months to10 years; five males, aged 32 to 55 and five females, aged 19 to 53 participated.

Acceptance and clarity of instructions. Nine of the 10 respondents completed this aspect of content validation. All nine respondents rated the instructions as clear. During this entire study, clarification or inquires regarding the instructions for completing MASHH were not mentioned by any respondent even when explicitly directed to consider the instructions.

Acceptance and clarity of items/questions: Content Validity Index
(CVI). Congruency of item sets was assessed using a modified form of the 4-point Likert scale proposed by Lynn (1986). Each item was rated from 1, not important, to 4, very important, and space was provided on the form for additional feedback. Guidelines developed to assist analysis included: Questions/items rated 3 or 4 with 80% agreement indicated content validation and were retained. Questions/ items rated 1 with 80% agreement were dropped. Questions/items rated 2 or 3 and all questions rated 1 by 1 expert were considered for modification.

In this analysis 245 items were reduced to 155. After items were deleted, two domains/determinants, Physical Health & Fitness and Role Functioning, had only two items remaining. Because both Physical Health & Fitness and Role Functioning had three or less items, these domains/determinants were removed and the four remaining items moved to other domains/determinants. MASHH was reduced from 18 determinants to 16. (See health structure in figure I3 in appendix I.) The internal structure of health for homeless people was modified; 90 items and two subscales were removed.

Clarity in response categories and physical layout. The five point scale from none of the time to all of the time selected for MASHH was tested with nine homeless respondents. In order to test the adequacy of response categories, 45 items selected randomly were used to test for a range of responses from respondents. All respondents reported that the response categories were a good fit with their experiences and the full range of response categories were utilized by each of the respondents.

Domain sorting. Again, nine homeless respondents completed the sorting exercise to test the adequacy of domains/determinants. When presented with a list of items from a domain/determinant, respondents judged if the questions or items in the domain/determinant fitted together as a group. The name of the domain/ determinant was withheld during the procedure. In this test, 236 of 245 items or 96% of the items fitted with the domain/determinant. Even though there were a total of 16 occurrences, only nine questions/items were identified as not belonging to a particular domain/determinant. Two of these items were deleted during the

analysis of items using content validity index (CVI), four items were moved because the domain/determinant was deleted and the items remaining were moved to another domain/determinant, two items were reworded, and for another, the item was reworded and later in content validation with nurse experts the domain/determinant was reworded. During this procedure, respondents assessed the fit of items that had been clustered into the same health determinant during secondary analysis. Except for the two health determinants, Physical Health & Fitness and Role Functioning, eliminated, other health determinants that emerged from the qualitative data analysis held.

Content Validation with Nurse Experts

Nurse experts assessed the fit of the domain/determinant label with the domain/determinant definition, content relevance of each item, and the content coverage for both the domain/determinant and the entire instrument. Because e-mail was used to communicate with nurse experts, two geographic locations were used. Of the eight nurse experts who participated, four were from New Brunswick and four from Toronto. Unlike the key informant interview technique used with homeless persons in content validation, nurse experts completed a paper and pencil assessment independently and at a time convenient to them.

Sample. This assessment was completed by eight clinical and research nurse experts. Nurses who were known to be in direct practice with homeless clients in New Brunswick and nurses who attended the first national conference on homelessness in 2007 and had expressed interest in the development of a new health measure for homeless persons from Toronto, Ontario were invited to participate. Although 14 nurses were invited to participate [no response (1), retired (1)], 12 nurses accepted the invitation to participate and 3 withdrew due to lack of time (2), and again, no response (1). Nine nurses completed the assessment but one had extensive missing data. Eight completed assessments were used in this analysis. The education of the eight experts ranged from BN to PhD; work environments included direct practice (6), research (1), and administration (1).

Assessment 1. The occurrence agreement for domain/determinant label and definition congruency was completed by 7 of the 8 nurse experts. Label and

definition congruency for nine domains/determinants was100%, for five domains/ determinants 86%, and the remaining domains/determinants had a label and definition congruency of 71%. Two domains/determinants, Self-Sufficiency and Street Survival Skills, were eliminated due to the number of items remaining after content validation with nurse experts. Domains/determinants of Social Health, Economic Health, and Social Support were collapsed into one domain/ determinant named Socioeconomic Health eliminating two more domains/ determinants for a total of four eliminated. After this analysis, 12 domains/ determinants remained. Seven of the remaining domains/determinants were renamed to enhance clarity – Food Security was changed to Nutrition & Food Supply, Not Being Sick to Soundness of Body, Addiction Status to Addiction Situation, Health Maintenance to Health Promotion, Work Security & Education to Work & School Situation, Family Relationships to Family Connections, and Barriers to Accessing Health Services to Access to Health Services. Only three domains/determinants remained unchanged – Emotional Health, Mental Health, and Spiritual Health. The feedback from expert nurses indicated that definitions were, at times, assessed from their understanding of the concept and not the fit of the definition with items in that subscale.

Nurse experts rated items on a 4 point scale from not relevant to relevant. Based on the content validity index (CVI), nurse experts rejected only 25 of the 245 items. Six of these items were retained because of high ratings from homeless respondents. However, nurse expert feedback regarding uniqueness was very insightful in identifying redundant items. Each expert (8) suggested new items but many of these items were very specific to their particular interest and the idea in the item was reflected in other items in the measure. However, three new items, "in the past two weeks did you practice safe sex", "in the past two weeks did you use available community services to meet your needs", and "in the past two weeks did you get paid a living wage " were added and included for review in assessment 2 with content nurse experts. In total, of the 155 items remaining after content validation with homeless persons, 38 items were deleted, two items were converted to 4 categorical items, and 3 were added for a total of 122 items. As

mentioned earlier, domains/determinants were further reduced from 16 to 12. (See health structure in figure I4 in appendix I.)

   Assessment 2. The specific purpose in assessment 2 of content validation with nurse experts was to assess items that were considerably reworded to reflect feedback in assessment 1 and to assess the three new items added. In total nine reworded items and three new items required further appraisal. Each nurse expert was e-mailed the questions and the same rating scale used in the first assessment. In this assessment, 8 items were accepted, three required slight modification, and one new item was deleted. At the end of this content validity assessment the structure describing the health determinants that influence the health of homeless persons was established – 121 items of which four were categorical. Items were clustered in 12 determinants. (See health structure in figure I5 in appendix I.) The health structure for homeless people operationalized by 121 items in 12 determinants in the McCormack Assessment Scale for the Health of Homeless Persons (MASHH) was ready for testing in a pilot study. (See MASHH at the end of content validation in appendix J.)

Stage 5: Pilot Study

Testing the McCormack Assessment Scale for the Health of Homeless Persons

   In this stage of instrument development, MASHH was tested and further refined using an iterative process that included Cronbach's alpha in reliability testing, and orthogonal and oblique rotations in confirmatory factor analysis. Items were reduced to a more manageable number through a series of data analysis iterations as well as from insight gained from notes taken during data collection and from preliminary analysis during data preparation. Although a more parsimonious measure is desired by practitioners and researchers, respondents rarely questioned the time it took to complete MASHH. On occasion, usually when a respondent had a person waiting for them, the respondent might inquire about how much longer to complete the interview. During data collection, respondents showed patience and were prepared to spend time with data collectors. At times, questions prompted respondents to go beyond the answer code to share the narrative behind the answer.

Sample

During the summer of 2008, 175 interviews with homeless persons were scheduled in three small cities in New Brunswick – Fredericton, Moncton, and Saint John. One interview was not completed because the person was intoxicated and unable to continue. Another six interviews were either discontinued (1) or removed (5) from the data set because the person had entered the study a second time. Most respondents entered the study in Moncton (70) with almost an even split with Fredericton (67). Thirty one respondents entered the study in Saint John for a total of 168 respondents. Data were collected in Fredericton and Moncton one day per week for seven weeks while data collectors were available to collect data in Saint John the remaining days of the summer.

Respondent ages ranged from 16 to 78 years with a mean age of 36 years. Females (51) ranged in age from 16 to 56 while males (117) ranged in age from 17 to 78. (See figure K1 in appendix K.) Females made up 30% of the sample. Data from Fredericton (Homeless Partnering Strategy, 2009), indicated that the ratio of homeless men to homeless women was 8:2. Assuming that other cities in New Brunswick are similar, the representativeness of men to women is greater in this sample (2:1) than in the population of homeless people in New Brunswick.

All respondents had some education. Only 4% (7) had stopped their education in elementary school while 31% (52) stopped their education in junior high making the total drop-out rate prior to high school 35% (52 + 7). The drop-out rate for respondents having some high school was 23% (38). Although data did not indicate last grade in school for the 10% (16) of respondents who completed a General Educational Development (GED), adding those respondents to high school brought the drop out rate for high school to 32% (54). On a more positive note, 30% (50) of the respondents had at least graduated high school or successfully completed their GED, and another 13% (21) had some or completed post secondary education at a community college or university for a total of 42% (71) of respondents. Education achievements for these respondents ranged from grade 4 to some graduate school. (See figure K2 in appendix K.)

Seventy two percent (121) of respondents had either been married or lived

common law and 38% (63) were currently involved in a serious relationship. However 28% (47) of respondents had no history of being involved in any relationship where a commitment was expected.

All but two respondents had work experience, and one of these respondents had volunteer experience. Respondents had done a variety of work from School Supervisor to Assistant Professor of Social Work, Radio Producer, Language Consultant, Artist, Financial Broker at the Toronto Stock Exchange, Taxi/Truck Drivers, City Workers, Domestic Workers/Janitorial Services, to working in the Fast Food Industry, Construction, Armed Forces, Security, Retail, Landscaping, Woods Work, Fisheries, Telemarketing, and a variety of trades including Electrical and Carpentry. Many were currently working part time in the Fast Food Industry, Roofing, and at the Carnival. Others identified themselves as self employed because work for them was being hired on a daily basis at a temp agency, bottle picking, panhandling, berry picking, snow shoveling or working in the sex trade. Seven percent (11) had a new job that was starting the week of the interview or had just started that week.

Most respondents (109) or 56% had done or were doing volunteer work. Again, diversity was evident in their selection of volunteer jobs. Many had been involved in fund raising for such organizations as the Heart & Stroke Foundation, United Way, CNIB, and so on. Others had volunteered for Meals on Wheels, Animal Rescue & SPCA, Senior Homes, Elections Canada, local Libraries, Boys & Girls Club and other places where they had direct contact with people the organization was serving. Many had or were currently volunteering at a Soup Kitchen and five of the respondents had been volunteer Fireman.

The main source of income for these respondents was welfare. Sixty seven or 40% of the respondents received welfare while 40 (24%) of the respondents, one in four, had no income. Respondents who were employed were either self employed at precarious jobs mentioned earlier or working part time without benefits such as workers compensation. Another 22 (13%) respondents were receiving disability pensions. In all likelihood, the source of these disability pensions was welfare but the source of the pension was not explored during data

collection. When disability pensions were taken into account, the total number of respondents receiving welfare could have been as high as 89 or 53%. Only three respondents stated that they received financial help from family and friends, however, some respondents mentioned in kind or emotional support. (See figure K3 in appendix K.) Some respondents were refusing to access welfare.

Data Preparation

In preparing data for analysis, data collection notes were reviewed for items that had required further explanation, distribution of data was examined using descriptive statistics, the relationships among variables were appraised using the bivariate correlation technique, and scoring procedures were considered.

Data Collection Notes

During data collection, notes were made on each interview at the end of each day. During the interview, data collectors marked with an asterisk and occasionally a comment any questions/items in MASHH that elicited questions or comments from respondents. Respondents were advised that these particular questions were being marked so that the questions could be improved. At the end of the day, data collectors wrote more detailed notes. All items that raised concerns for greater than 5% or eight of the respondents were examined and later collapsed into 5 categories.

Skip question option required. Some questions in MASHH were not appropriate under certain conditions. For example, if a respondent selected none of the time for question 015 "In the past two weeks did you experience sickness that stopped you from doing things you wanted to do?", then question 016 "In the past two weeks did you need to go to the hospital?" is not appropriate. Skipping a question that is made inappropriate by the answer to a previous question is an accepted strategy to use when developing measurement scales (Streiner & Norman, 2008). In the previous example the skip question strategy was not utilized and one respondent wondered if the second question was a trick question, while another responded that, "the answer has to be none of the time, I was not sick". MASHH has several skipped questions, but three situations had been missed and this omission influenced respondents' answers on four items. Three of

these items fast recovery (017), meds security (020), and clean needles (061) were removed from the pilot study because 14%, 38%, and 27% of respondents respectively had difficulty with the question. The fourth item/question, require hospital (016), described in the previous example was questioned by only 2% of respondents and was retained for analysis. These items/questions that were removed will be modified and returned to MASHH for testing in a future study as either a continuous variable (fast recovery 017) or a categorical variable (meds security 020 and clean needles 061). (See table L1 in appendix L.)

Time limitation - a two week recall. The stem for all items "In the past two weeks did you …" requested that respondents consider questions within a two week context. Although acceptable when considering recall, this time limitation did not make sense for some questions. For example, 071, "In the past two weeks did you keep appointments with health care providers?" For respondents who did not have any appointments in that time frame but normally kept appointments, the time limit of two weeks was constraining. If the respondent did not have an appointment and answered none of the time, the response could imply that this respondent did not keep appointments. If the respondent answered from a little of the time to all of the time, the response indicated that the respondent had an appointment. Because some items contained a mixed message, namely keep appointments (071) identified by 27% of the respondents, safe sex (072) identified by 33% of the respondents, and health information (074) identified by 8% of the respondents, these items were removed from this analysis but will be modified and returned to MASHH as a categorical variable in future testing. (See table L1 in appendix L.)

Response scale did not capture categorical items. For some items, respondents automatically answered yes or no, suggesting that a categorical scale might be more appropriate for these items. For example, item 116 "In the past two weeks did you have a medicare card?" Most respondents (72%) replied yes or no, and needed to be redirected to the response scale. Although no items were removed for this reason during data preparation, these items might need to become categorical items in future testing of MASHH.

Clarity in item meaning. Respondents asked the meaning of some items. Ten percent of respondents asked for clarification in the meaning of item, apply knowledge (068). Five percent inquired about items, daily structure (098) and use resources (101). As data were prepared for analysis, no items were removed for this reason.

Conceptually inappropriate items. Items; job training (084), school (089), medical benefits (117), and family doctor (118) made no coherent sense to respondents. Items job training (084) and school (089) seemed beyond the range of possibilities for these respondents. Street workers, bottle pickers, and others joked about on the job training. The idea of the item medical benefits (117) or having benefits beyond medicare was astonishing to 39% of respondents and almost half of the respondents 49% did not believe that a social worker would find them a family doctor as suggested by the item, family doctor (118). Thus, these items; job training (084), school (089), medical benefits (117), and family doctor (118) were removed. (See table L1 in appendix L.)

Also, for some respondents the item weight change (023) was difficult to assess as respondents had no method or indicator to measure body weight changes. As well, the idea of a change in body weight was difficult to score as an increase in body weight might contribute positively or negatively to health status. For some respondents an increase in body weight might increase health status while for others a decrease in body weight might contribute to health status, so this item was removed. (See table L1 in appendix L.)

Descriptive Statistics

All items were examined using descriptive statistics. Some items were skewed and significant for kurtosis. Histograms verified results. However, items were not removed from the scale on this criterion alone but items significant for kurtosis and skewness were identified. (See table L1 in appendix L.) These items would be considered for removal if additional criteria confirmed item weakness.

Bivariate Correlation

For some items, higher correlations were within expected subscales but the accepted cutoff for deleting items with low correlations is inconsistent. Generally,

a correlation of .30 or less is the rule (Ferkitch, 1991; Field, 2009; Knapp & Brown, 1995; Norman & Streiner, 2008). However, the exception suggested maintaining items when several items correlate at .20 or greater in a subscale (Field). Because of this ambiguity, items with low correlations were not removed on that criterion alone but would be considered for removal if additional criteria confirmed item weakness. In this inspection there were no items that did not correlate with any other item. Items; safe work (082), punctuality (083), and work clothes (085) had very high correlations from .879 to .916. Because safe work (082) is likely to include punctuality (083) and work clothes (085), these highly correlated items punctuality (083) and work clothes (085) were removed to decrease redundancy. (See table L1 in appendix L.)

Scoring Procedures

In preparation for examining reliability coefficients, any item requiring reverse scoring was reversed prior to data analysis (DeVillis, 2003; Field, 2009). In considering items for reverse scoring, the summative meaning of items was thought-out. Summing some items did not make conceptual sense. For example, if you never smoked, you scored 5 and if you smoked all of the time you scored 1. However if you smoked you were asked the next 2 questions - a smoker could potentially score from 3 to 15. A smoker had a high likelihood of scoring greater than 5 and subsequently having a higher health status score than a non smoker. Some of these items/questions will be converted to categorical variables so that respondents receive a score of one when engaging in an activity to decrease risky behavior or subtract a score of one when engaging in risky behavior. In the above example, a smoker who attended smoking cessation would get one point added to the health status score while a smoker who did not engage in smoking cessation would have one point subtracted.

All questions that potentially increased the total health status score because the respondent engaged in high risk behavior or had challenging health concerns were not conceptually sound in that any score on these items actually increased the summative health status score even when the behavior adversely influenced health as described in the above example. As a result, most of the items

in the Access to Health Services subscale/determinant were removed because people who needed to access the health care system could score from 9 to 45 points higher than a person who did not experience a health challenge and did not need to access the health care system. Other items, location (115), medicare (116), and needs addressed (119), applied to all respondents including those who were not experiencing a health challenge and therefore were maintained in MASHH. Although these three items remained in the subscale/determinant Access to Health Services, these items, in all likelihood, would load on another factor/determinant such as Health Promotion during confirmatory factor analysis. Therefore, the determinant Access to Health Services was removed. In total, 11 continuous and four categorical items were removed from the determinants Addiction Status and Access to Health Services. (See table L1 in appendix L.)

Summary of Data Preparation for Analysis

During data preparation 24 items/questions and one subscale/determinant were removed. MASHH was reduced to 93 items/questions and 11 subscales/ determinants. Two items, punctuality (083) and work clothes (085), were eliminated for redundancy as evidenced by high bivariate correlations. Five items, weight change (023), job training (084), school (089), medical benefits (117), and family doctor (118), did not make conceptual sense to respondents. Another 11 items, quit smoking (055), reduce smoking (056), stop alcohol (058), substance treatment (064), substance group (065), paper work (109), wait for services (110), honest answers (111), concerns heard (112), privacy (113), and shelter or clinic (114), did not make conceptual sense in a summative score for health status. Of these 11 items, substance treatment (064) and substance group (065) will be recommended for conversion to categorical with five other items restricted by the time limitations of two weeks; medication security (020), clean needles (061), keep appointments (071), safe sex (072), and health information (074), for a total of seven items. (See table L1 in appendix L.) Because these items/questions refer to actions taken by an individual that either promoted or challenged health, these items will be converted to categorical items, yes or no, with one point being added or subtracted. For example, if a respondent answered yes to item health

information (074) indicating that access to health information was possible, then one point would be added to the overall health score while if a respondent answered no then one point would be subtracted. Because answers to all items converted to categorical variables either contribute to or adversely influence health, the new name being considered for this new determinant is Health Actions and Assets.

One other item, fast recovery (017), would potentially benefit from a skip question option being added and will be returned to MASHH for psychometric testing in a future study. The subscale/determinant, Access to Health Services is eliminated and another subscale/determinant Work and School Situation is renamed Work Situation to represent the items remaining in the subscale. Therefore, the health structure after data preparation contained 11 subscales/ determinants and 93 items/questions. However, when MASHH is revised, there will be 93 + 1 continuous variables/items and seven categorical variables/items. (See figure L1 in appendix L.)

Analysis using an Iterative Process

The iterative process used in this analysis began with reliability analysis. Alpha coefficients were calculated for each subscale/determinant using Cronbach's alpha. After examining the Cronbach's alpha coefficient, item-total statistics were examined. Of particular interest was Cronbach's alpha if any one item was deleted. After this initial examination of reliability statistics, confirmatory factor analysis was run to corroborate the structure of health when 11 factors were extracted. Then reliability for each subscale/determinant was compared to factors/determinants extracted.

Round 1

Using the iterative process, the first round of analysis was conducted. After running the reliability analysis for each subscale/determinant, 11 factors and 93 items were entered into confirmatory factor analysis. In the orthogonal rotation, an 11 factor solution was achieved in 25 iterations with the eigenvalue cutoff at 2.078. The percentage of variance explained was 45.903. The oblique rotation had the same results but 55 iterations were required. Some items loaded

differently under the two rotations. In both rotations the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was mediocre at .577 (Field, 2009).

In round 1, items were removed if Cronbach's alpha for a subscale/ determinant was decreased by its inclusion and the item did not load on a factor in orthogonal and oblique rotations in an 11 factor solution. Fifteen items were removed: vitamin pills (001), require hospital (016), injury prevention (022), oppressed bond (027), control anger (039), hope (047), uncontrolled things (049), smoke cigarettes (054), drink alcohol (057), make decisions (070), physical activities (079), safe work (082), job search (088), avoid violence (094), and oppressed (103). (See table M1 in appendix M.) However, five items, vitamin pills (001), injury prevention (022), smoke cigarettes (054), drink alcohol (057), and physical activities (079) will be considered for conversion to categorical variables/items and returned to MASHH for further testing in a future study. Item/ question, require hospital 016, was removed from this data set because of its performance in this round and concerns identified in data preparation indicated that a skip question option be added for this item. Therefore, item, require hospital 016, will be modified and returned to MASHH for future testing as a continuous variable/item. (See table M1 in appendix M.)

During confirmatory factor analysis, the factor/determinant Housing Situation was expanded to include four items; clean clothes (075), suitable clothes (076), hygiene supplies (077), and clean environment (078) from Health Promotion as well as the item medicare (116) that had been in Access to Health Services and the item safe ID (097) from Socioeconomic Health. When reliability analysis was conducted on the expanded subscale/determinant, Housing Situation, Cronbach's alpha was increased from .699 to .807. Because all these items were related to the living environment, the subscale was renamed Living Environment. One of the original items in this subscale/determinant, couch surfing (012), did not load on this factor and reduced alpha from .831 to .807. Item, couch surfing (012), was moved to Family Connections. (See table M1 in appendix M.)

Having moved the four items from Health Promotion to Living Environment, and removed items keep appointments (071), safe sex (072), and

health information (074), from this subscale/determinant during data preparation only two items remained in Health Promotion. The item, physical activities (079) loaded on a mixed factor in the orthogonal rotation and did not load in the oblique rotation was removed and will be considered for conversion to a categorical variable. Item, enough sleep (073), was maintained for the second round in the likelihood that it might load on Living Environment during confirmatory factor analysis. When item enough sleep (073) was added to the reliability analysis for this subscale/determinant, the alpha coefficient was marginally increased from .831 to .833. The Health Promotion factor/determinant was thus eliminated from MASHH.

Another subscale/determinant Nutrition & Food Supply was renamed Food Insecurity to embody the items remaining in that subscale. Four other items, childhood abuse (028), childhood (029), harassed (100), and fight for rights (102), were moved from their original subscale/determinant to Soundness of Body where the items were loading and contributing to Cronbach's alpha. The two remaining items from the determinant Access to Health Services, location (115) and needs addressed (119), loaded on a mixed factor and were maintained for one more round. Cronbach's alpha coefficient for each subscale maintained ranged from .638 for Mental Health to .860 for Emotional Health. The health structure after round 1 of data analysis contained 10 subscales/determinants and 78 items. After round 1 MASHH was modified to include 78 + 2 continuous variables/items and possibly 12 categorical variables/items. (See figure M1 in appendix M.) Items; vitamin pills (001), require hospital (016), injury prevention (022), oppressed bond (027), control anger (039), hope (047), uncontrolled things (049), smoke cigarettes (054), drink alcohol (057), make decisions (070), physical activities (079), safe work (082), job search (088), avoid violence (094), and oppressed (103); were removed from MASHH for this analysis. (See table M1 in appendix M.)

Round 2

Again, the same iterative process was followed. After running the reliability analysis for each subscale/determinant, 10 factors and 78 items were

entered into confirmatory factor analysis. In the orthogonal rotation, a 10 factor solution was achieved in 25 iterations with the eigenvalue cutoff at 1.991. The percentage of variance explained was 48.314. The oblique rotation had the same results but 35 iterations were required. Some items loaded differently under the two rotations. In both rotations the KMO measure of sampling adequacy remained mediocre at .655 (Field, 2009).

In round 2, seven items were removed. (See table N1 in appendix N.) Items were removed if Cronbach's alpha for a subscale/determinant was decreased by its inclusion and/or the item did not load on a factor in orthogonal and oblique rotations in a 10 factor solution. In this round the factors/determinants remained stable at 10. All items removed were in the subscale/determinant, Socioeconomic Health, and included receive help (093), obtain money (095), enough money (096), harassed (100), use resources (101), self sufficiency (105), and transportation (106). Three items removed from this data set during round 2, enough money (096), use resources (101), and transportation (106), will be considered for conversion to categorical variables/items in future testing. Because all items associated with an economic aspect of health were removed, the subscale/determinant was renamed Social Health. (See figure N1 in appendix N.)

Again, during confirmatory factor analysis some items loaded on subscales/determinants that were different from their original subscale/ determinant. When these items contributed to Cronbach's alpha in the scale where they loaded, the item was moved. In this round the subscale/determinant Mental Health expanded to 10 items; two items, respect (045) and motivated (048) from Emotional Health, three items, daily structure (098), self care (099), and involved citizen (104) form Social Health, and two items, location (115) and needs addressed (119) from the deleted subscale/determinant Access to Health Services. The item healthy childhood (030) was moved to Soundness of Body and the item sense of humor (044) was moved to Social Health. At the end of this round, Cronbach's alpha coefficient for each subscale ranged from .703 for Social Health to .844 for Emotional Health. The health structure after round 2 of data analysis contained 10 subscales/determinants and 71 items. After round 2, MASHH was

modified to include 71 + 2 continuous variables/items and possibly 15 categorical variables/items. (See figure N1 in appendix N.) Items, receive help (093), obtain money (095), enough money (096), harassed (100), use resources (101), self sufficiency (105), and transportation (106), were removed from MASHH for this analysis. (See table N1 in appendix N.)

Round 3

Following the same iterative process, reliability analysis was conducted on the items within each subscale/determinant, and 10 factors and 71 items were entered into confirmatory factor analysis. In the orthogonal rotation, a 10 factor solution was achieved in 25 iterations with the eigenvalue cutoff at 1.849. The percentage of variance explained was 50.524. The oblique rotation had the same results but 40 iterations were required. Some items loaded differently in each rotation. In both rotations the KMO measure of sampling adequacy remained mediocre at .673 (Field, 2009).

During confirmatory factor analysis, when items did not load on a factor or did not contribute to Cronbach's alpha in the scale where the item loaded, the item was removed. (See table O1 in appendix O.) In this round, items adequate water (004) and days without food (007) were removed and will be converted to categorical items. Food Insecurity was reduced to 4 items. The item enough sleep (073) in Living Environment is removed and will be converted to categorical; reducing Living Environment to 12 items. In Soundness of Body item healthy childhood (030) and item fight for rights (102) were removed. Soundness of Body was reduced to seven items. In Emotional Health, item someone to trust (036) was removed making 12 items in that subscale/determinant. In Addiction Situation, the item avoid substance (066) was removed. Addiction Situation was reduced to 4 items. In Mental Health, items, location (115) and needs addressed (119), from the original subscale/determinant Access to Health Services were removed and will be considered for conversion to categorical variables in future testing. The item sense of humor (044) was moved from Social Health to Mental Health – this is the third subscale/determinant on which this item loaded; in round 1 item, sense of humor (044), loaded on Emotional Health, in round 2, Social Health, and in round

3, Mental Health. In this round, Mental health was reduced to 9 items and Social health was reduced to 3 items. Other subscales/determinants remained unchanged; Family Connections (3 items), Spiritual Health (4 items), and Work Situation (4 items). Cronbach's alpha coefficient for subscales/determinants ranged from .701 for Social Health to .854 for Emotional Health. The health structure after round 3 of data analysis contained 10 subscales/determinants and 62 items. After round 3, MASHH was modified to include 62 +2 continuous variables/items and possibly 20 categorical variables/items. (See figure O1 in appendix O.) Items; adequate water (004), days without food (007), healthy childhood (030), someone to trust (036), avoid substance (066), enough sleep (073), fight for rights (102), location (115), and needs addressed (119) were removed from MASHH for this analysis. (See table O1 in appendix O.)

Round 4

After running the reliability analysis for each subscale/determinant, 10 factors and 62 items were entered into confirmatory factor analysis. In both the orthogonal and oblique rotations, a 10 factor solution was achieved in 25 iterations with the eigenvalue cutoff at 1.728. The percentage of variance explained was 53.861. In both rotations the KMO measure of sampling adequacy achieved good at .700 (Field, 2009).

Only two items were removed in this round; the item, avoid problems (046), from Emotional Health and sense of humor (044) from Mental Health. (See table P1 in appendix P.) Both items did not load in both rotations and both decreased alpha in the previous subscale/determinant loaded. Although item childhood abuse (028) in Soundness of Body did not load in this confirmatory factor analysis, it does contribute to alpha and was maintained for future testing of MASHH. At the end of this round, Cronbach's alpha coefficient for each subscale ranged from .701 for Social Health to .849 for Emotional Health. The health structure after round 4 of data analysis contained 10 subscales/determinants and 60 items. After round 4 MASHH was modified to include 62 continuous variables/items and possibly 20 categorical variables/items. (See figure P1 in

appendix P.) Items sense of humor (044) and avoid problems (046) were removed from MASHH. (See table P1 in appendix P.)

Round 5

In order to confirm that the health structure that evolved in round 4 was holding, confirmatory factor analysis was conducted with 10 factors and 60 items. In both the orthogonal and oblique rotations, a 10 factor solution was achieved in 25 iterations with the eigenvalue cutoff at 1.726. The percentage of variance explained was 54.662. In both rotations the KMO measure of sampling adequacy achieved good at .704 (Field, 2009). No items were removed and no modification was made to subscales/determinants. At the end of this analysis, Cronbach's alpha coefficient for subscales/determinants ranged from .701 for Social Health to .849 for Emotional Health, while the alpha coefficient for MASHH is high at .872.

MASHH: An Operational Definition of Health for Homeless Persons

At the end of this analysis of pilot data, MASHH had been reduced to 10 factors/determinants. However, in future testing of this scale, items/variables suggested for conversion to categorical items will be included in the Personal Health Practices category in a determinant called Health Actions & Assets. (See table Q1 in appendix Q.) Even though each determinant is a subscale, subscales have been categorized into three major categories; Health Dimensions, Foundational Basic Human Needs, and Personal Health Practices. (See figure 2.) Health Dimensions contains six subscales: Emotional Health with 11 items, Mental Health with eight items, Spiritual Health with four items, Social Health with three items, a specialized subset of Social Health named Family Connections with three items, and Soundness of Body with seven items plus the two items removed in this analysis but will be revised and returned for further analysis in a future study; require hospital (016) removed in the data preparation stage and fast

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┌─────────────────────────────────────────────────────────────────────┐
│                        MASHH Determinants                             │
│                                                                       │
│  Health Dimensions =6                    Basic Human Needs =3          │
│  Emotional Health (11)          Food Insecurity (4)                   │
│  Mental Health (8)              Living Environment (12)                │
│  Spiritual Health (4)           Work Situation (4)                    │
│  Social Health (3)                                                    │
│    Family Connections (3)        Personal Health Practices =2         │
│  Soundness of Body (7 +2)       Addiction Situation (4)               │
│                                 Health Actions & Assets (20)          │
│                                                                       │
│                                                                       │
│  Health Determinants: 11                                              │
│  Items / Questions: 60 + 2 continuous variables and 20 categorical    │
│  variables                                                            │
└─────────────────────────────────────────────────────────────────────┘
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Figure 2. MASHH: Health Determinant Structure for Homeless Persons.

recover (017) removed in round I of analysis using the iterative process described earlier. The category, Foundational Basic Human Needs, contained three subscales: Food Insecurity with four items, Living Environment with 12 items and Work Situation with four items. The category of Personal Health Practices contains two subscales: Addiction Situation with four items and Health Actions & Assets with 20 categorical items yet to be tested. At the end of the pilot study, MASHH contains in total 60 plus 2 continuous items/variables and 20 categorical items for a total of 82 items.

Health Dimensions

The major category of Health Dimensions has six subscales/determinants; Emotional Health, Mental Health, Spiritual Health, Social Health, Family Connections, and Soundness of Body. Three of the six subscales/determinants in this major category did not undergo a name change during analysis – Emotional Health, Mental Health, and Spiritual Health. The subscale/determinant labeled Family Relationships was changed to Family Connections to reflect the items remaining after content validation with homeless persons.

Social health. During content validation, three subscales/determinants; Social Health, Economic Health, and Social Support were collapsed into one

subscale/determinant named Socioeconomic Health. In all three subscales/ determinants, items were reduced during content validation with homeless people and nurse experts, and again during the iterative procedure used to analyze pilot data. In the subscale/determinant of Social Health, only three items remained at the end of content validation and only one, congregate (090), was retained after the pilot study. In the subscale/determinant of Social Support, only four items remained after content validation of which two items, help friends (091) and listened to (092), were retained after the pilot study. In the subscale/determinant of Economic Health only two items, obtain money (095) and enough money (096), were assessed as important by homeless experts during content validation. Even though nurse experts suggested adding items to capture very specific information about sources of income, adequate income as supported by the assessments of homeless experts was adopted as the underlying latent variable influencing health status. During the analysis of pilot data, one item, enough money (096), was recommended for conversion to a categorical item in Health Actions & Assets. So, even though three subscales/determinants were combined into the generally accepted health dimension of socioeconomic health after content validation, only three items related to Social Health remained after analysis of pilot data and the subscale/determinant label Social Health was appropriate.

Soundness of body. The subscale/determinant label, Not Being Sick, did not have good fit for nurse experts during content validation. Because nurse experts held the belief that health is more than the absence of illness, both the label and definition were called into question even though the label reflected items in the subscales/determinant. During content validation with homeless experts the subscale/determinant, Physical Health & Fitness, was removed when only two items out of 10 were accepted as important by them. One of these items, having good physical body function (024) was moved to Not Being Sick and the subscale/determinant name changed to Soundness of Body and moved from the major category of Basic Human Needs to Health Dimensions.

Basic Human Needs

The major category of Basic Human Needs had three subscales/ determinants: Food Insecurity, Living Environment, and Work Situation. Even though the subscale/determinant Soundness of Body was moved to the major category Health Dimensions during content validation, the major category of Basic Human Needs gained another subscale/determinant when the major category of Personal Role Expectations was collapsed and the subscale/ determinant Work Situation was moved to the major category of Basic Human Needs.

Food insecurity. This subscale/determinant had been named Food Security. However, during content validation with nurse experts this label was viewed as ambiguous. For nurse experts, the more basic concern of having an adequate food supply was compared to the more recent use of the term; safe production and process of foods. Therefore the subscale/determinant was named Nutrition & Food Supply but renamed after analysis of pilot data to Food Insecurity as remaining items no longer reflected nutritional value. According to Tarasuk (2005), food insecurity included inadequate safe and nutritious food with limited or insecure access to acceptable food to meet dietary requirements. Even though the name for this determinant has been modified twice, the essential basic need for food was unchanged. Because the idea of supplementary nutrition was now missing, the structure of health was modified somewhat.

Work situation. A similar situation occurred with Work Security & Education. The idea of gaining temporary work was realistic but work security and gaining an education appeared to be beyond the expectations of homeless persons. Even though, the subscale/determinant was renamed Work & School Situation after content validation with homeless persons, during data analysis of pilot data, items on the job training (084) and going to school (089) were removed because these items were viewed beyond the range of possibilities for respondents. Because the subscale/determinant no longer contained items referring to school, the name for this subscale/determinant was changed to Work Situation. In some communities (one shelter in Moncton and the learning

exchange in Saint John) support was available to those who wished to complete high school equivalency or General Educational Development (GED). This structure of independent learning with tutorial support available appeared to have a better fit with not having a place to live. However, the idea of attaining further education or going to school was removed from MASHH. In this way the inherent structure of health for MASHH was modified during analysis of pilot data.

Living environment. Housing Security was changed to Housing Situation during content validation to encompass the living environment of homeless persons. Having a secure home, although referenced in Article 25 (1) of the Universal Declaration of Human Rights (United Nations, 1948), was beyond the expectations of homeless people who described temporary shelters, squats, and so on as their housing situation. The name Housing Situation was changed again during the pilot study when items relating to the overall living environment loaded with items from Housing Situation in confirmatory factor analysis. The new name, Living Environment, encompassed not only a safe place to be and keep personal belongings, and protection from the elements, but also included having hygiene supplies, appropriate clothing, a clean environment, and being able to keep your identification papers, such as a medicare card, secure.

Personal Health Practices

The major category of Personal Health Practices evolved into two subscales/determinants, Addiction Situation and Health Actions & Assets. Items contained in the subscale Addiction Situation were continuous items while items in Health Actions & Assets were all categorical and the only categorical items in MASHH. These categorical items have not yet been tested because all items were converted from continuous to categorical during analysis of pilot data.

Addiction situation. During content validation with homeless persons the subscale/determinant Addiction Status was changed to Addiction Situation. The status aspect of the label was rejected because it implied importance of, rather than the actual assessment of substance use.

Health actions & assets. This new subscale/determinant was developed to reflect the actions taken or the assets accessed by homeless persons in their efforts

to achieve health. Although items within this subscale/determinant were converted from continuous variables that did not load in confirmatory factor analysis and did not contribute to the reliability of the expected subscale/ determinant, the items were considered important during content validation and the underlying ideas were not represented in other items. In a future study, respondents will receive a score of one when engaging in an activity to decrease risky behavior or have a score of one subtracted when engaging in risky behavior.

Research Setting

Data collectors commenced recruitment inside the shelter system and expanded to outside the shelter but still on shelter grounds or in nearby parks where homeless persons tended to congregate. Although safety of the data collectors was not threatened, outside evening data collection during the week that welfare cheques were issued was avoided. During that week, substance use outside the shelter appeared to be higher. Even though the number of potential respondents inside the shelter was less than in other weeks, recruitment of new respondents to the study continued. As well, interviewers took note of any unusual occurring events in the setting. For example, when the police were investigating an incident in the shelter, data collectors did not enter the setting.

Research Environment

When collecting data in public places, noise could be an issue. In order to assess noise during the pilot study, data collectors were asked to assess roughly the noise level during interviews using a crude scale from quiet with minor distractions to noise + with some background noise and more lengthy disruptions during the interview to noise ++ where background noise was more discernable to noise +++ where at times both questions and answers were repeated in order to be heard. Eighty five (51%) of the interviews were conducted in a quiet environment with minor distractions. Most of these interviews were conducted within a shelter environment. Data collection was interrupted, at times, by shelter staff or a patron coming into a small kitchen, health office, sitting room, and so on. During those times, the interviewer waited until the person retrieved the item they were seeking before continuing the interview. During nine interviews (5%), these interruptions

were either more frequent or lengthier. Still, the environment was reasonable for data collection in public places. During 38 (23%), interviews the background noise was more discernable but still within reason. At times, loud greetings intended for persons across the street or the soft murmur of people in dialogue were heard. However, the noise level for 36 (21%) interviews made communication difficult because both the interviewer and the respondent had to ask that questions and answers be repeated. In one situation there was construction occurring at the shelter, in another a large gathering assembled where people were raising their voices to be heard, and in still another situation an unscheduled Bible Study was commenced without warning. Overall, the majority of interviews, 94 interviews or 56 %, were conducted in a reasonable environment for interviewing. The remaining 74 interviews (44%) had increased background noise from group gatherings or busy activity in the environment. During outside interviewing, noise from traffic was an obstacle and interruptions or inquiries from other homeless people were frequent. In the latter environment interviewers required a concentrated effort. Yet, even when both questions and answers had to be repeated, respondents remained engaged.

Respondents

For the most part, respondents were interested in the study. Even when the environment was very noisy, respondents stayed focused when data collectors were struggling to stay engaged. This environment was relatively unfamiliar to the data collectors who entered the environment for a short time and then left. The respondents, on the other hand, had familiarity with the noise in the environment and appeared to be able to stay attentive. It was the attentiveness of the respondents that helped the interviewers to become inured to the noise and stay engaged in the dialogue.

Again data collectors were asked to assess roughly the attentiveness of respondents on a scale from distracted to somewhat attentive to attentive. Respondents were considered attentive when appropriate questions were asked, eye contact was made, time was taken to consider a question, and when their focus remained on the topic even if a personal narrative was told. Of the 168

respondents who participated, 131 (78%) were rated as attentive. This level of engagement was exceptional for any population group, but having this response from persons struggling to survive was remarkable. Only 11 (7%) respondents were rated as distracted during the interviews. These respondents appeared to be either in a personal crisis or upset over an event that had occurred in the environment. The remaining 26 (15%) respondents were rated as somewhat attentive. These respondents appeared anxious, hurried, guarded, or aloof.

Chapter 5

Discussion

The McCormack Assessment Scale for the Health of the Homeless (MASHH) operationalized an assessment of health status for people who do not have a home. A critical review of the literature revealed that there was no existing measure specific to the health experiences of homeless people. This health measure named the determinants of health experienced by homeless persons; essential in developing, choosing, and measuring the impact of interventions designed for homeless persons (Fitzpatrick, et al., 2003; Reichenbach, et al., 1998; Rosengard, et al., 2001). MASHH, a multidimensional health status measure, delineated the health structure for homeless persons. Eleven subscales/ determinants containing a total of 62 continuous and 20 categorical items operationalized this health structure. Although still in the early stages of psychometric testing, MASHH contributed to knowledge development by operationalizing and naming the determinants that influenced the health status of homeless people.

During this study, a structure of health that identified critical health determinants for homeless persons was developed, empirical indicators describing the latent variables for the construct of health for homeless persons were delineated, and evidence to confirm the theoretical understanding that health is a multidimensional concept with common and unique variations between population groups was acquired (Baumann, 1961; Blaxter, 1990; Crawford, 1984; Dolfman, 1973; Herberts & Eriksson, 1995; Liaschenko, 1998; Manderbacka, 1998; McKague & Verhoef, 2003; Meleis, 1990; Popay, et al, 2003; Richmond & Ross, 2009; Staniszewski, et al., 1999). Accepting that self-assessed health status was a "'gold standard' measure of health need" (Congdon, 2001, p. 24), the development of this measure will advance the efforts of health providers, policy makers, and researchers.

This study operationalized perceptions of health held by homeless persons, one subset of lay persons. Although nurse scholars from the time of Florence Nightingale identified health as having multiple determinants, disease being one

of these determinants, health has been most often operationalized as a dichotomous variable with a single dimension (Meleis, 1990; Reynolds, 1988). This acceptance of unidimensional health measures limited both scholars' understanding of health and practitioners utilization of health assessments. In this study, the theoretical and operational definition of health was informed by the health experiences of homeless persons as revealed in the secondary analysis of two qualitative research studies (McCormack & Gooding, 1993; McCormack & MacIntosh, 2001). After discussing the lessons learned during the development of MASHH, this new measure will be compared to the Determinants of Health Model outlined in the Framework for Health Promotion (ACTH, 1994; Health Canada, 1996; Public Health Association of Canada, 2002; Strategic Policy Directorate…, 2001). The recruitment strategies used in this research study will be discussed, and further suggestions to gain evidence for validation and reliability of MASHH and its utility will be recommended. Finally, the limitations of this study as well as implications for this measure in research, practice, and policy, and methods of dissemination will be presented.

MASHH: Development and Knowledge Integration

Items developed from a qualitative data set respected the pattern in which people experience health, uncovered the conceptual meaning of the process of living that particular pattern (Fleury, 1993), explicated essential determinants of the health structure, and improved the shared meaning and understanding between researchers and respondents (Fleury; Imle & Atwood, 1988; Solano-Flores & Nelson-Barber, 2001; Staniszewska, et al., 1999; Thomas, et al., 1992; Tilden, et. al., 1990). This approach to item generation supported qualitative validation (Hilton, et al., 2001). Also, items developed from qualitative data generally expand upon what was published about a particular abstract concept, thus improving content coverage and subsequently reliability (Hall & May, 2001; Imle & Atwood; Tilden, et al.; Waltz, et al., 2005). Because the last new category/ determinant to emerge from the qualitative data was from interview 11 and no new determinants were uncovered in an additional 29 interviews, confidence was

generated that the range or variability of the meaning of health held by homeless persons was captured.

In this study respondents were receptive to the physical layout of MASHH. As data collectors read each item aloud, respondents referred to the response categories printed on a laminated 21 ½ by 14 centimeters blue card. Some respondents appeared to silently read the item as data collectors read the item aloud. At no time in the study, did respondents question the instructions, physical layout of MASHH, or the response category. The response category appeared to have familiarity for homeless people.

This secondary analysis of homeless persons' narratives maintained that an inductive approach to item generation can yield sufficient items for a substantial item pool (DeVellis, 2003). The number of items (288) generated in data reduction 3 in Stage 1 was not only encouraging in that good coverage was plausible but also daunting in that the items that best captured the construct of health for homeless persons needed to be selected while those items that contributed less needed elimination. After applying methodological procedures from qualitative and quantitative research traditions in each of the research stages, unessential items were removed and a more parsimonious measure with a more manageable number of items was reached. Items were reduced from 288 to a more parsimonious measure of 62 continuous variables and 20 categorical variables. Two of the 62 continuous items/variables removed in this analysis will be returned to MASHH for testing in future studies and the new subscale Health Actions & Assets containing 20 categorical variables is yet to be tested. As well, subscales/determinants were reduced from 43 to 11. Names of health subscales/ determinants changed to reflect the items remaining after each analytical procedure. In summary, MASHH, a multidimensional health status measure, named the determinants that depicted the health construct for homeless persons.

MASHH and the Framework for Health Promotion

MASHH operationalized the determinants of health for homeless persons. In Canadian society, one of the dominant health models that emerged from the Population Health Framework was the Determinants of Health Model (ACPH,

1994; Health Canada, 1996; Moloughney, 2004; Public Health Agency of Canada (PHAC), 2010; Public Health Association of Canada, 2002; Strategic Policy directorate…, 2001; Wilson, et al., 2009). A comprehensive measure of health within this model was so difficult that most research studies focused on narrow but manageable aspects of the Determinants of Health Model (Ballantyne, 1999; Buijs & Olson, 2001; Denton & Walters, 1999; O'Hara, 2006). Although these studies extended knowledge about, and understanding of, the determinants influencing health, the interconnectedness of the determinants and the indirect effect of determinants was not measured (MacKay, 2001). MASHH, inductively derived to measure the health experiences of homeless persons, was a response to this problem for this population.

Within the Population Health Framework, the determinants of health were clustered into five major categories of social and economic environment, physical environment, personal health practices, individual capacity and coping skills, and health services with the determinant of healthy child development transcending all major categories (ACTH, 1994). These major categories were further clustered into two core categories named collective and individual conditions. The collective conditions of social and economic environment, physical environment, and health services were foundational to the individual conditions of personal health practices, and individual capacity and coping skills (ACTH).

Subscales/determinants in MASHH that described the health of homeless persons were clustered into three major categories: 1) Health Dimensions that mostly reflected individual capacity and coping skills with some reference to the social environment; 2) Basic Human Needs that reflected the social and economic environment in the Determinants of Health Model: and 3) Personal Health Practices that reflected drug use not prescribed for medical reasons and 20 categorical items/variables that addressed both personal health practices and health services. (See figure 3.)

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┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│  Subscales: Health Dimensions              Health Determinants    │
│                                                                   │
│     •  Soundness of Body        Individual Capacity & Coping Skills │
│     •  Emotional Health         Individual Capacity & Coping Skills │
│     •  Mental Health            Individual Capacity & Coping Skills │
│     •  Spiritual Health         Individual Capacity & Coping Skills │
│     •  Social Health            Social & Economic Environment      │
│     •  Family Connections       Social & Economic Environment      │
│                                                                   │
│  Subscales: Foundational Basic Human Needs    Health Determinants  │
│     •  Food Insecurity          Social & Economic Environment      │
│     •  Living Environment       Social & Economic Environment      │
│     •  Work Situation           Social & Economic Environment      │
│                                                                   │
│  Subscales: Personal Health Practices         Health Determinants  │
│     •  Addiction Situation      Individual Capacity & Coping Skills │
│     •  Health Actions & Assets  Personal Health Practices          │
│                                                                   │
│  Health Determinants: 11                                          │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
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Figure 3. Comparison of Health Determinant Structure for Homeless People and Determinants of Health Model within the Population Health Framework.

Health Dimensions

In the cluster of subscales/determinants that described Health Dimensions in MASHH, all but Social Health and Family Connections referred to the capacity of the homeless person to maintain their own health or their personal competence to determine their own destiny. This result was consistent with findings in other studies that homeless persons were motivated to participate in strategies that enhanced their survival and promoted their personal well being (Boydell, et al., 2000; Butler, 1993; Conner, et al., 1999; Goering, et al., 1990; Martin & Vacha, 1994; Martins, 2008; McCormack & MacIntosh, 2001; Rew, 2003; Williams, et al., 1997). In the model of health uncovered from the grounded theory study conducted by McCormack and MacIntosh, participants took on the active role of health assessors.

Basic Human Needs

In a comparison of the Determinants of Health Model within the Population Health Framework with the subscales/determinants of MASHH clustered in the major category of Basic Human Needs, similarities and differences were noted.

Work situation. In the subscale/determinant Work Situation in MASHH, items reflected the general intent of the determinant employment and working conditions in the Determinants of Health Model. However, items in MASHH related to safety did not load during confirmatory factor analysis and did not add to the reliability of the subscale/determinant during the analysis of data from the pilot study. All but two respondents in the pilot study had worked but many had very tenuous employment often with temporary work agencies or had engaged in self employed initiatives that had a high potential for injury. Homeless persons, although interested in work, appeared to put safety aside in the interest of gaining work. For example, young men accepted a day's work with a roofing company without prior knowledge about safety requirements or even appropriate footwear. Other Canadian studies described similar results regarding the tenuous working situations experienced by homeless persons (Daiski, 2007; McDonald, et al., 2009; The Salvation Army, 2009; The Street Health Report, 2009).

Food insecurity. Food Insecurity, or the notion of food, was subsumed under personal health practices in the Determinants of Health Model within the Population Health Framework; implying that nutritious food was individual choice. Among homeless citizens, food was a component of basic survival and often related to quantity even though food quality was a concern (Daiski, 2007; Martins, 2008; McCormack & Gooding, 1993; McCormack & MacIntosh, 2001; McDonald, et al., 2009; The Street Health Report, 2009). Food insecurity occurred when income was too little for individuals to meet their needs (Friendly, 2008; McIntyre et al., 2002; Tarasuk, 2005). Canadians receiving welfare or minimum wage were unable to purchase food necessary for a nutritious diet (Friendly; McDonald, et al.; Power, 2005). Food Insecurity was not a result of

personal health practices for homeless persons but a consequence of their social and economic environment.

Living environment. In MASHH, the subscale/determinant Living Environment included basic protection from the elements as well as access to a safe place to be and to keep one's belongings. As described by Moloughney (2004), a house depicted the physical dimension of housing, while home was the psychosocial dimension of housing that included security. The Living Environment subscale/determinant in MASHH was more basic than the notion of housing mentioned within the physical environment in the Determinants of Health Model within the Population Health Framework. However, health was compromised when housing was below standard and challenged further when housing was absent or at best tenuous and/or below standard (Alley, et al., 2009; Barrow, et al., 1999; Canadian Population Health Initiative…, 2009; Canadian Public Health Association, 1997; Carter & Polevychok, 2004; Conway, 1995; Dickey, et al., 1997; Frankish, et al., 2005, 2009; Harris, 1999; Jackson & McSwane, 1992; Kyle & Dunn, 2008; Lechky, 1999; McDonald, et al., 2009; Power, et al., 1999; Scott, 2007; Segal, et al., 1998; Spector, 1999; The Street Health Report, 2007; Thomson, et al., 2009; White, C., 1999; White, M.E., 1999). Homeless persons experienced a loss of place, the very extreme of inadequate housing (Carter & Polevychok; Cooper, 2006; Diaski, 2007). Items in the Living Environment subscale/determinant of MASHH reflected housing as protection from the elements, safety, cleanliness, and suitable clothing. Again adequate and suitable housing was linked to income or the lack thereof, making affordability an issue (Cooper; Diaski). For homeless people, the economic and social environment removed the idea of house and home.

All three subscales/determinants in the major category of Basic Human Needs in MASHH were linked to the social and economic environment described in the Health Determinants Model within the Population Health Framework. If collective conditions including social and economic environment were accepted as foundational to individual capacity to promote and maintain health, then the capacity for homeless persons to improve their health situation was challenged to

a great extent. In other words, actions of homeless persons to improve health were constrained by social exclusion (Canadian Population Health Initiative…, 2009; Diaski, 2007; Frankish, et al., 2005, 2009; O'Hara, 2006). Once again, rights identified as social and economic rights in the Universal Declaration of Human Rights (1948) were violated (Farmer, 1999; Hunt, 2003; Mann, 1996).

Personal Health Practices

The last major category in MASHH, Personal Health Practices, included the subscale/determinant Addiction Situation. Like other segments of society, addictions were present in the homeless population, although the prevalence rates were not firm. Hwang (2001) indicated that the lifetime prevalence rate for alcohol disorders among homeless men was 60%. Interestingly, in the survey conducted by DeJong (2007) in Toronto, 49% of clients in the Streets to Homes program decreased their alcohol consumption and 17% of that 49% had quit alcohol. The results were even more astonishing for taking drugs for the purposes of getting high; 74% had decreased their substance use of which 33% had quit entirely. One cannot help but wonder if the use of addictive substances was a behavioral coping mechanism for those persons who do not have a home.

Because MASHH was inductively derived to include the health experiences of homeless persons, not all health determinants from the Determinant of Health Model within the Population Health Framework were included. The absence of income, education, and health services from the determinants were most striking. Yet, the underlying condition of the subscales/ determinants in Basic Human Needs was the social and economic environment. However three items, enough money (096), use resources (101), and transportation (106), in Health Actions & Assets were related to economic assets. Four items, substance treatment (064), keep appointments (071), location (115), and needs addressed (119), referred directly to health services and two others clean needles (061) and substance group (065) were indirectly related to health services as these items reflected services provided by non-profit organizations in New Brunswick.

Research Setting: Recruitment Procedures

Shelter staff and respondents received and accepted data collectors into the research setting. Because data collectors lived in or near Saint John and research assistants had an office in a community health centre in a neighbourhood with a poverty rate of 31.5% (The Greater Saint John…, 2008), a more flexible approach was used to collect data compared to the approach used in Fredericton and Moncton.

Data collectors travelled to Fredericton and Moncton one day a week for seven weeks, arriving in the city for 1 PM and sometimes staying as late as 8 PM. As evening approached respondents dispersed. Despite this situation, 70 respondents entered the study in Moncton and 67 entered in Fredericton while only 31 respondents entered in Saint John where data collectors were available at least three days per week. This discrepancy existed even though the number of individuals who stayed in shelters in Saint John in 2008 was reported as 1,160 individuals or 1% of the population; in Fredericton 485 individuals or 1% of the population, and in Moncton 725 individuals or .6% of the population based on 2008 homeless counts and 2006 population census (Homelessness Partnering Strategy, 2009). The prevalence of homelessness was less in Moncton than in Fredericton and Saint John, yet the largest portion of the sample was recruited into the study in Moncton. Because data collectors were received positively into the research setting in all cities, the recruitment approach may have created this difference. In all likelihood, being in consistent places on consistent days of the week enhanced respondent entry into this study.

The recruitment strategy of offering homeless persons an additional $10.00 food card for each new respondent who consented to participate in the study was successful in Moncton and Saint John. In each of these cities, homeless recruiters sought out the "hard to reach homeless" and introduced them to data collectors. However, in Fredericton, the remuneration of food cards for recruiting another respondent was not acceptable to the shelter director and staff who requested that this strategy not be used. Because the help of outreach workers was important to respondent access, this request was honoured. Even though some

respondents told other potential respondents about the study, the only option available to earn more food cards in Fredericton was to enter the study a second time. In Fredericton five interviews were removed from the study because of repeat interviews. In Moncton, only one interview was removed, and in Saint John, no interviews were removed. In this study, respondents proved to be reliable recruiters assisting data collectors to recruit the "hard to reach homeless"; such as those sleeping in parks, cars, abandoned buildings, garden sheds, and so on.

Respondent Benefits

Overall, respondents liked that attention was being paid to their health experiences*.* Data collectors were thanked for having an interest in the health of respondents and many respondents expressed their gratitude for the food card. At one shelter six women who had either recruited or participated in the study requested Sobeys cards. While interviews were being conducted, other women were making a grocery list for a girls' night, and other items to supplement supplies at the shelter. One young man did a lot of recruiting in order to have food on his way home to Ontario. He selected cards from Tim Hortons, Sobeys, and McDonalds. Another three young women planned a supper out together at McDonalds. Another gentleman had only $10.00 in his wallet. He said the Tim Hortons card would help with food until he received a cheque that he was expecting. One couple became very active recruiters in the hard to reach homeless population and received in total 15 food cards between them. They saved other money to rent an apartment while using the cards for food.

Limitations

This report of research described the development and pilot testing of a health status scale for homeless persons or MASHH. Further testing of MASHH will be required. During this initial testing, slight changes were made to the structure of health as the items that operationalized that structure became more parsimonious. The inclusion criteria limited respondents to those who spoke and read English and lived in New Brunswick.

During the initial testing of MASHH, the sample size was not large enough to consider population subgroups. For example, stratifying the sample by

gender, age, and/or ethnicity would increase knowledge about the representation of various subgroups within the homeless population. In this study, six respondents self disclosed aboriginal ancestry; in future studies new understanding about this subgroup might be gained if ethnic background were tracked.

Other demographic data would further add to knowledge about the population of homeless persons. For example, knowing for certain the source of disability pensions would improve accuracy regarding the number of persons receiving welfare and still living in very precarious situations on the street. Income from welfare in Canada has been identified as inadequate (Friendly, 2008). As well, for those respondents who completed a General Educational Development (GED), information about what grade was last completed was not collected so the drop-out rate in junior high and in high school was unclear. For those respondents who did not complete public schooling, housing issues may have developed for them prior to high school.

Future Research

Future psychometric testing will further refine scale structure and garner evidence of validation and reliability. Each study in which MASHH is tested and the same health structure is yielded will add evidence that the measure is generalizable beyond this sample in one geographic region to the larger homeless population in Canada (Field, 2009). While two imminent studies are suggested, other studies such as those described in paragraphs three and four below will need to be considered in order to build evidence of validation.

1.   At this time, it remains open that a large national study might influence the psychometric properties of MASHH. Using both mathematical and theoretical frameworks, MacCallum, Widaman, Zhang, and Hong (1999) demonstrated the significance of considering communality of items and level of overdetermination of factors when determining sample size in factor analysis. They claimed that rules of thumb using N:p ratios where N represents the sample size and p the number of items needed to be regarded with caution as there was no evidence to suggest how big N should be in order "to obtain adequately small

standard errors of loadings" (p. 85). At this stage in instrument development, insight into the potential structure was gained during qualitative validation in item generation, content validation using the Content Validity Index (CVI) method, and construct validation using confirmatory factor analysis. Application of the guidelines developed by MacCallum and colleagues indicated that the lower end of the N:p ratio was acceptable. However, a national study to verify the health structure represented by MASHH would test this premise. Study sites could include large metropolitan cities such as Vancouver, Calgary, Winnipeg, Toronto, and Halifax as well as smaller cities such as St John's, Saint John, Sudbury, Regina and Victoria. This study could take into account geographic differences as well as resource differences between smaller and larger cities, and further test the psychometric properties of MASHH.

2.   A regional study in New Brunswick is suggested to test the relevancy of MASHH in practice. Three nurses from Moncton and Saint John could use MASHH to assess health status and then compare their findings with usual assessment data. The utility of MASHH in practice must be assessed. As well, thresholds for each subscale/determinant and MASHH must be established. For MASHH to be an acceptable measure for practitioners and researchers guidelines for decision making must be developed.

3.   Another study of validation could involve using MASHH to collect data from homeless respondents and respondents who live in homes but have low-income thresholds based on the post-income tax income where 64% or more of post-income tax income is spent on essential needs such as food, clothing, and housing (Statistics Canada). This study would demonstrate that MASHH distinguishes between respondents who live in poverty but are housed and those who are not housed.

4.   Although attrition is likely to be a problem, a longitudinal study would indicate the predictive capacity of MASHH to indicate potential morbidity and mortality. For example, those homeless respondents who had low scores on MASHH would have a higher mortality rate in ten years than those homeless respondents who scored high on MASHH. In considering potential morbidity

predictions, those respondents who scored high on the mental health subscale/ determinant would be less likely to receive a diagnosis of a mental illness and so on.

Implications for Practice, Research or Policy

Practice

After further testing, providers who use MASHH to identify the determinants influencing the health status of homeless persons could prioritize their care or at least pay attention to the determinants with the lower health status scores. Because homeless people tend to enter the health care system sporadically, making every interaction count is critical to their continued use of health services and providers who take every opportunity to influence the health of homeless people are likely to have the greatest impact on this population.

Research

Again, after further testing, researchers conducting intervention studies could use this health structure to identify determinants to measure outcomes for a specific intervention or the entire measure might be appropriate in an outcome study. Also, MASHH would be an excellent measure to use in a national study to gain an understanding of the health status of this population.

Policy

Further testing of MASHH would result in a measure that could be used to inform policy makers about the determinants important to homeless persons. In this way, policy makers could become more inclusive and responsive to the health determinants that have the greatest influence on the health experiences of homeless people. This narrowing of focus would be critical during times of economic restraint. Population health policies providing the greatest good for this vulnerable population will be needed. If an intersectoral approach to provide a "hand-up approach" to homeless people was accepted, then maybe all policies would become health policies and all human activity would be recognized as influencing health (Davidson, McIntosh, McCormack & Jones, 2002; Evans and Stoddart 1994).

Knowledge Dissemination

This sequential research study was conducted over a period of four years. During that time, papers were presented at two international, two national, and a regional conferences, posters at one international and two national conferences, and two presentations to health and service providers in New Brunswick. Currently, a manuscript is being reviewed for publication. Recently, an invitation to become a Board member for a non-profit organization that promotes awareness about living in poverty, Urban Core Support Network, was accepted. This position might lead to the integration of these research findings in short articles published in the popular press.

Conclusion

In this study, an instrument that captured the health experiences of homeless persons was developed for subsequent psychometric testing. The selection of the qualitative approach to instrument development resulted in psychometric validation beginning in item construction and continuing through content validation with homeless respondents and nurse experts, and confirmatory factor analysis in the pilot study. This approach to instrument development acknowledged that health is experienced from within a social context and is reflective of current health situations (Liaschenko, 1998; Meleis, 1990; Twaddle, 1974). Although subscale/determinant names were modified to more accurately reflect remaining items, the intent of each subscale/determinant was modified only slightly while the health structure was refined further.

The theoretical definition and item pool were inductively derived through secondary analysis of two previously conducted qualitative studies. The feedback from content validity experts, homeless persons and nurses who were engaged with this population, assisted in developing the operational definition, MASHH. In a pilot study, the statistical procedures of Cronbach's alpha in reliability analysis and confirmatory factor analysis reduced items in this new measure to a more manageable number.

The scholarly contribution of this research study to the understanding of health of homeless people was reflected in the theoretical and operational conceptualizations derived from empirical data. For the first time, empirical indicators that reflected the health experiences of homeless people were delineated, the determinants of health experienced by homeless persons were named, and a health status measure for homeless persons that can be self or provider administered was prepared for psychometric testing.

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Appendix A

Framework for Population Health
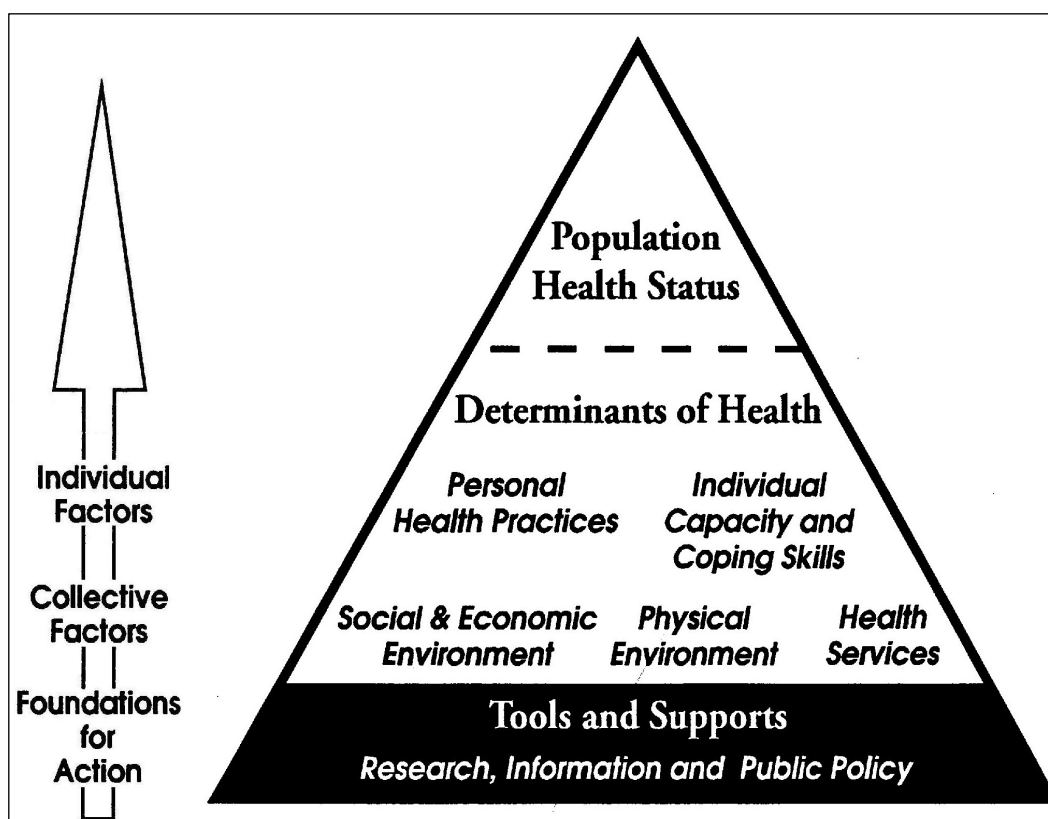
Figure A1. Framework for population health (ACTH, 1994).

Appendix B

Item Clarity Assessment: Response Forms and Guidelines

Rate each item as Clear (C) or Unclear (U). Comment on all items rated unclear and examine each for ambiguity, professional jargon, value-laden words, general comprehension and length, redundancy, and double-barrelled nature of items.

List of items	Response
2. In the past two weeks did you eat food from each of the food groups?	2. **(C) (U)**_____ _____
76. In the past two weeks did you want to stop drinking alcohol?	76. **(C) (U)**_____ _____
185. In the past two weeks did you get help to search for work?	185. **(C) (U)**_____ _____

Figure B1. Response Sheet: Item Clarity Assessment.

Analysis Guidelines

- Items rated clear by 10 respondents - accept.
- Items rated clear by 8 to 9 respondents – modify, or accept and observe during content validation (These items were printed in red in content validation.)
- Items rated clear by 5 to 7 respondents - consider reasons for unclear and modify or delete.
- Items rated clear by 1 to 5 respondents – delete.

Table B1. Analysis guidelines for item interpretability.

Appendix C

Content Validation: Response Forms for Homeless Experts

Rate the instructions as **Clear** or **Unclear/Unacceptable.** If unclear say why in the space provided.

> The following questions are about health situations. Think about your own health during the past two weeks and rate how true each question is for you. There are no right or wrong answers. Please circle the number that best describes how each question fits with your experiences.
>
> If the question is true for you *none of the time*, circle 1.
> If the question is true for you *a little bit of the time*, circle 2.
> If the question is true for you *some of the time*, circle 3.
> If the question is true for you *most of the time*, circle 4.
> If the question is true for you *all of the time*, circle 5.
>
> **Clear   Unclear**
>
> _____
> _____
> _____

Figure C1. Response Sheet: Acceptance and Clarity of Instructions.

Rate each question as follows:
Circle 1 if the question is *not important*.
Circle 2 if the question is somewhat *important*.
Circle 3 if the question is *important*.
Circle 4 if the question is *very important*.

Rate each question as Clear (C) or Unclear (U). If unclear, say why in the space provided.

Set A: In the past two weeks, did you

List of situations	Rating	Response
22. do any physical activity?	1 2 3 4	22. **C U** _____ _____
43. know who you could trust?	1 2 3 4	43. **C U** _____ _____
113. find a way to get money when too sick to work?	1 2 3 4	113. **C U** _____ _____

Figure C2. Response Sheet: Acceptance and Clarity of Items – Sample Questions.

Appendix C

Content Validation: Response Forms for Homeless Experts

The following questions are about health situations. Think about your own health during the past two weeks and rate how true each question is for you. There are no right or wrong answers. Please circle the number that best describes how each question fits with your experiences.

If the question is true for you *none of the time*, circle 1.
If the question is true for you *a little bit of the time*, circle 2.
If the question is true for you *some of the time*, circle 3.
If the question is true for you *most of the time*, circle 4.
If the question is true for you *all of the time*, circle 5.

Do the ratings from 1 to 5 fit your experiences? Please circle yes or no. Please add any comments.

In the past two weeks, did you

List of items	Rating (1 - 5)	Response
40. have worries?	1 2 3 4 5	40. yes no _____ _____
161. find the health information you needed?	1 2 3 4 5	161. yes no _____ _____
244. get your health needs addressed?	1 2 3 4 5	244. yes no _____ _____

Figure C3. Response Sheet: Clarity of Response Categories – Sample Questions.

SET: _____

Does each question belong in the same group? Please answer with Yes or No. If no, say why the question does not belong.

In the past two weeks, did you

List of ideas	Same Group?	Comments
22. do any physical activities?	2. **Yes No**	22. _____ _____
23. walk?	23. **Yes No**	23. _____ _____
28. have good body function?.	28. **Yes No**	28. _____ _____

Figure C4. Response Sheet: Domain Sorting - Sample Questions.

Appendix D

Content Validation: Response Form for Nurse Experts

SET: _____16_____

DATE: _____

RATER: _____

LABEL: Spiritual Health

DEFINITION: This health dimension describes a level of self awareness that transcends into meaningfulness. Some individuals describe a feeling of wholeness and a belief in a connection with a higher power as defined by the individual. (Baldacchino, 2006; Graham, Brush & Andrew, 2003; Miner-Williams, 2006)

Congruency of Domain Label and Domain Definition: Yes   No

Rate Items:
If the item is *not relevant*, circle 1.
If the item *requires major revision*, circle 2.
If the item is *relevant but requires minor revision*, circle 3.
If the item is *relevant*, circle 4.

List of Questions	Same Group?				Comments
200. pray?	1	2	3	4	Yes No _____
201. meditate?	1	2	3	4	Yes No _____
202. take time out to think quietly?	1	2	3	4	Yes No _____
203. attend spiritual services?	1	2	3	4	Yes No _____
204. have faith in God?	1	2	3	4	Yes No _____
205. get support from people in your faith?	1	2	3	4	Yes No _____
206. follow your inner feelings?	1	2	3	4	Yes No _____

Are there any additional items that you think should be included in this set?
_____
_____
_____

Figure D1. Response Sheet: Content Validation for Clinical and Research Experts.

Appendix E

Map of New Brunswick
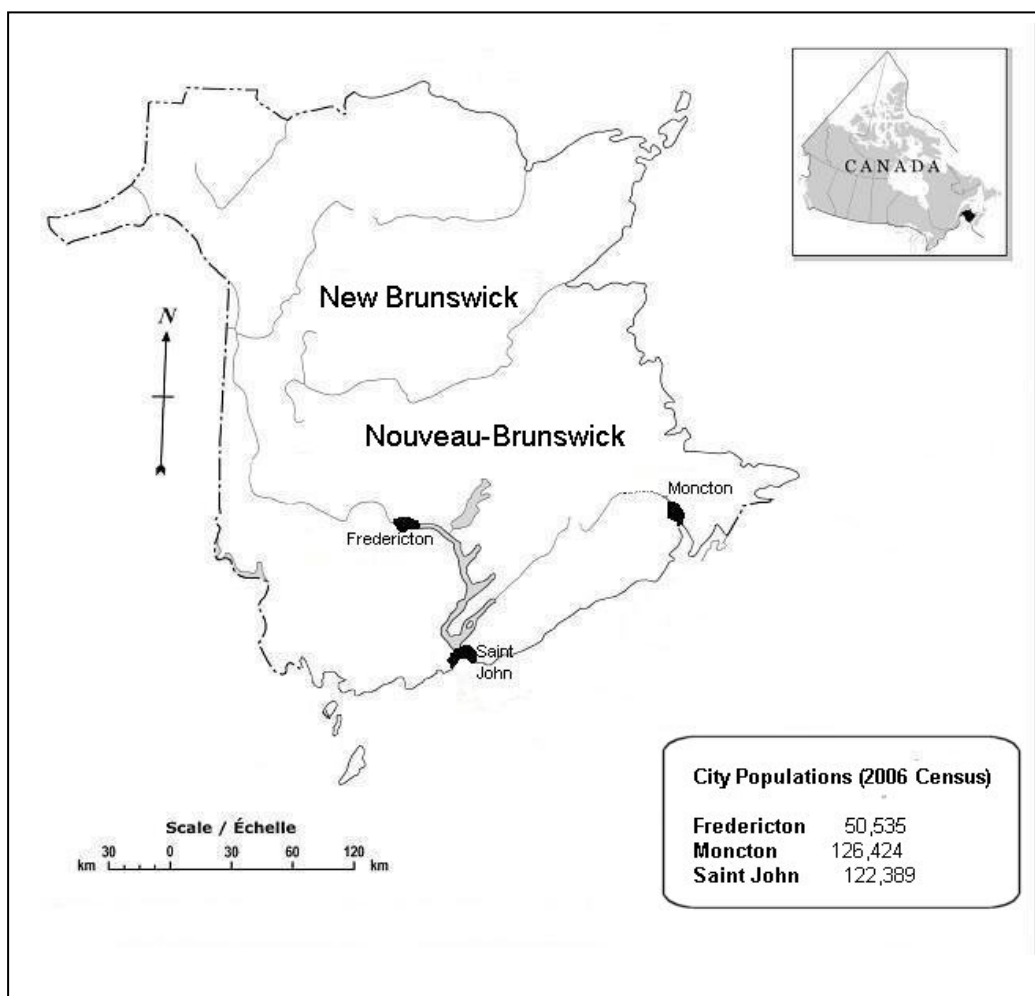
Appendix F

Informed Consent: Homeless Respondents Phase 1

Title: The Development of a Health Measure for Homeless People

Nurse Researcher: Dianne McCormack, RN, PhD Candidate
School of Nursing, McGill University

Supervisor: Dr. Celeste Johnston
James McGill Professor
School of Nursing, McGill University

Introduction: Why am I doing this research?

The main reason I am developing a health status measure that describes the health situation of homeless persons is to name the things or indicators that influence their health. This information can lead to improved health assessments being put into place by health care workers who attend to the health needs of homeless people. Also when health indicators are grouped together they can be used to inform policy makers about the determinants of health or factors that influence the health status of homeless people.

Study Procedure: What will happen during this study?

People who do not have a permanent address are invited to talk to the nurse researcher about a health form that she has developed. You will be asked to talk about your understanding of the ideas presented in the form, to describe if the ideas apply to you, and to identify other ideas that need to be included. The researcher wants to know if the ideas in the health form make sense to you and describe your health experiences. After an outreach worker who provides services to homeless persons introduces the researcher to you, she will explain the study and will ask you to sign this consent form. You will then be invited to answer questions about the new form in a face to face tape-recorded interview that might take around two hours of your time.

Benefits and Risks: What are the good and bad things about this study?

Benefits. Although there are no known direct benefits for you, a potential benefit might occur if you become aware of a community service that was previously unknown to you. You might gain a sense of satisfaction from having had the opportunity to have your opinions about a new health form considered. A future benefit might occur when health care providers use this health form to gain a better understanding of your health situation. Perhaps the health determinants identified by the nurse researcher will be used to help policy makers develop better services.
Risks. The nurse researcher seeking your involvement in this study will try not to interrupt any activities that you consider important to promoting your health; such as, obtaining shelter and/or food, or seeking help to address a health concern. Because daily activities that influence your health will not be interrupted, you will not be exposed to any known risks.

Withdrawal from the Study: Who decides if I can quit?

You decide if you want to be a part of this study. If you say yes now but at any time do not wish to continue, that is OK. You do not have to say why you changed your mind. It is your choice.

Rights during the Study: Do I have to answer all questions?

Even though, the researcher would like for you to answer all questions, you may not want to complete them all and that is OK. You decide. Involvement in this study is voluntary. You may ask questions at any time during the study.

Confidentiality: Who will know my answers to the questions?

Your name will not be given to anyone. Your name will not appear on the health forms used in this study. You will be assigned a number code that will appear on all health forms. Your signed consent form will be kept separate in a locked filing cabinet. When the results of this study are published, your name or identifying information will not be used.

Contact: Who do I contact if I want more information?

If you want more information about this study or have new questions, leave your contact information with an outreach worker and the nurse researcher will get back to you. If you prefer you can contact the nurse researcher, Dianne McCormack, at 506-648-5734 or dmccorma@unbsj.ca

Signatures:
I agree that the research study described in this consent form has been explained to me and all my questions have been answered to my satisfaction. I have been given a copy of the consent form.

I agree to participate in this study.

_____   _____   _____
Name   Signature   Date

_____   _____   _____
Nurse's Name   Nurse's Signature   Date

_____   _____   _____
Witness's Name   Witness's Signature   Date

Appendix F

Informed Consent: Homeless Respondents Phase 2

Title: The Development of a Health Measure for Homeless People

Nurse Researcher: Dianne McCormack, RN, PhD Candidate
School of Nursing, McGill University

Supervisor: Dr. Celeste Johnston
James McGill Professor
School of Nursing, McGill University

Introduction: Why am I doing this research?

The main reason I am developing a health status measure that describes the health situation of homeless persons is to name the things or indicators that influence their health. This information can lead to improved health assessments being put into place by health care workers who attend to the health needs of homeless people. Also when health indicators are grouped together they can be used to inform policy makers about the determinants of health or factors that influence the health status of homeless people.

Study Procedure: What will happen during this study?

People who do not have a permanent address are invited to complete a self-report of their health situation. After nurses explain the research study and the consent form is signed, nurses will ask you questions about your health experiences. This discussion might take about half an hour of your time. Your answers will be recorded on the form.

If you are in regular contact with the nurse, you might be invited to participate in a repeat self-report of your health in one week. At that time, if you have not experienced changes in your health situation during the past week, you might be invited to complete the self-report of your health one more time.

Benefits and Risks: What are the good and bad things about this study?

Benefits. Although there are no known direct benefits for you, a potential benefit might occur if you become aware of a community service that was previously unknown to you. You might gain a sense of satisfaction from having had the opportunity to have your opinions about a new health form considered. A future benefit might occur when health care providers use this health form to gain a better understanding of your health situation. Perhaps the health determinants identified by the nurse researcher will be used to help policy makers develop better services.

Risks. Nurses who seek your involvement in this study will try not to interrupt any activities that you consider important to promoting your health; such as; obtaining shelter and/or food, or seeking help to address a health concern. Because daily activities that influence your health will not be interrupted, you will not be subjected to any known risks.

Withdrawal from the Study: Who decides if I can quit?

You decide if you want to be a part of this study. If you say yes now but at any time do not wish to continue, that is OK. You do not have to say why you changed your mind. It is your choice.

Rights during the Study: Do I have to answer all questions?

Even though, the researcher would like for you to answer all questions, you may not want to complete them all and that is OK. You decide. Involvement in this study is voluntary. You may ask questions at any time during the study.

Confidentiality: Who will know my answers to the questions?

Your name will not be given to anyone. Your name will not appear on the health forms used in this study. You will be assigned a number code that will appear on all health forms. Your signed consent form will be kept separate in a locked filing cabinet. When the results of this study are published, your name or identifying information will not be used.

Contact: Who do I contact if I want more information?

If you want more information about this study or have new questions, leave your contact information with an outreach worker and the nurse researcher will get back to you. If you prefer you can contact the nurse researcher, Dianne McCormack, at 506-648-5734 or dmccorma@unbsj.ca

Signatures:
I agree that the research study described in this consent form has been explained to me and all my questions have been answered to my satisfaction. I have been given a copy of the consent form.

I agree to participate in this study.

_____   _____   _____
Name   Signature   Date

_____   _____   _____
Nurse's Name   Nurse's Signature   Date

_____   _____   _____
Witness's Name   Witness's Signature   Date

Appendix G

Constant Comparative Method of Qualitative Analysis

Descriptive Codes	Interview validation	Descriptive Categories
Getting all your vitamins	**6** – P1, P8, R4, R20, RR1, RR5	Food security
Getting enough sleep	**20** – P1, P2, P3, P6, P8, R1, R2, R3, R4, R5, R7, R9, R11, R12, R14, R17, R21, RR5, RR8, RR11	Sleep & rest
Eating food from each of the food groups, eating a balanced diet, maintaining nutrition	**27** – P1, P4, P5, P7, P8, R1, R3, R5, R6, R7, R9, R11, R12, R13, R15, R16, R17, R18, R20, R21, R22, RR3, RR4, RR5, RR6, RR7, RR9, RR11	Food security
Standing on your own two feet & not having illness related complaints, not being sick, not having a disability	**17** - P1, P6, R4, R5, R12, R14, R18, R19, R20, R21, R22, RR1, RR3, RR6, RR9, RR10, RR11	Not being sick
Eating three meals a day	**12** - P1, P2, P5, P6, P7, R2, R11, R14, R19, R22, RR10, R11	Food security
Eating as much as you can eat whenever you can	**8** - P1, P8, R4, R9, RR5, RR8, RR9, RR11	Food security
Getting exercise, keeping in shape	**18** - P1, P3, P4, P5, P7, P8, R2, R3, R5, R6, R7, R12, R13, R14, R18, R20, RR1, RR4	Physical fitness
Getting enjoyment from what you do	**2** - P1, R18	Contentment/ Emotional health
Having a good body weight	**12** - P1, P2, P7, R2, R4, R12, R13, R16, R17, R20, RR3, RR4	Body weight/ Physical health

Table G1. Descriptive codes and broad categories generated in interview P1 and subsequently well matched to descriptive codes in other interviews.

Appendix H

Data Reduction in Secondary Analysis

Reduction 1: 43 Health Determinants	Reduction 2: 28 Health Determinants	Reduction 2: 28 Health Determinants
1. **Food security**	1. Food security	1. Food security
2. **Sleep & rest**	2. Sleep & rest	2. Sleep & rest
3. **Not being sick**	3. Not being sick	3. Not being sick
4. **Physical fitness**	4. Physical fitness	4. Physical fitness
5. Contentment	5. ~~Contentment~~ **5. Emotional health positive**	5. Emotional health positive
6. Good body weight	6. ~~Good body weight~~ **6. Physical health**	6. Physical health
7. **Role functioning**	7. Role functioning	7. Role functioning
8. **Addiction status**	8. Addiction status	8. Addiction status
9. Childhood health	9. ~~Childhood health~~ **9. Family relationships**	9. Family relationships
10. **Mental health**	10. Mental health	10. Mental health
11. **Social health**	11. Social health	11. Social health
12. **Access to health services**	12. Access to health services	12. Access to health services
13. **Financial status**	13. Financial status	13. Financial status
14. **Housing**	14. Housing	14. Housing
15. Intellectual health/Learning	15. ~~Intellectual health/Learning~~ #10 Mental health	
16. Self-worth	16. **Self-worth – 15**	15. Self-worth
17. Emotional health	17. **Emotional health negative - 16**	16. Emotional health negative
18. Personal hygiene	18. **Personal hygiene – 17**	17. Personal hygiene
19. Trust	19. **Trust – 18**	18. Trust
20. Independent/ self determining	20. **Independent/ self determining - 19**	19. Independent/ self determining
21. Social support	21. **Social support – 20**	20. Social support
22. Health maintenance/ Doing the work of health	22. **Health maintenance/ Doing the work of health – 21**	21. Health maintenance/ Doing the work of health
23. Environmental health	23. **Environmental health - 22**	22. Environmental health
24. Privacy	24. ~~Privacy~~ #5 Emotional health positive	
25. Transportation	25. ~~Transportation~~ #12 Access and 27 Work	
26. Safety	26. ~~Safety~~ #11 Social health	
27. Choice	27. ~~Choice~~ #27 Work	
28. Stressful situations	28. ~~Stressful situations~~ #16 Emotional health negative	
29. Family support	29. ~~Family relationships~~ #9 Family relationships	
30. Suitable dress	30. ~~Suitable dress~~ #6 Street survival skills	
31. Respite from the street	31. **Respite from the street - 23**	23. Respite from homelessness
32. Family roots	32. ~~Family roots~~ #9 Family relationships	
33. Relationship with health workers	33. **Relationship with health workers - 24**	24. Relationship with health workers
34. Physiological health	34. ~~Physiological health~~ #6 Physical health	
35. Vitality	35. ~~Vitality~~ #3 Not being sick	
36. Spiritual health	36. **Spiritual health – 25**	25. Spiritual health
37. Street survival skills	37. **Street survival skills - 26**	26. Street survival skills
38. Socially acceptable	38. ~~Socially acceptable appearance~~ #26 Street survival skills	
39. Work	39. **Work - 27**	27. Work
40. Education	40. **Education - 28**	28. Education
41. Getting out of poverty	41. ~~Getting out of poverty~~ #23 Respite from homelessness	
42. Staying away from trouble	42. ~~Staying away from trouble~~ #11 Social health	
43. Hope	43. ~~Hope~~ #26 Street survival skills	

Table H1. Data reduction 1 and 2.

Appendix H

Data Reduction in Secondary Analysis

Reduction 2: 28 Health Determinants	Reduction 3: 23 Health Determinants	Reduction 3: 23 Health Determinants
1. Food security	1. Food security	1. Food security
2. Sleep & rest	2. Sleep & rest (#14 Housing & # 17 health maintenance)	
3. Not being sick	**3. Not being sick – 2**	2. Not being sick
4. Physical fitness	**4. Physical fitness - 3**	3. Physical fitness
5. Emotional health positive	**5. Emotional health positive - 4**	4. Emotional health
6. Physical health	**6. Physical health - 5**	5. Physical health
7. Role functioning	**7. Role functioning - 6**	6. Role functioning
8. Addiction status	**8. Addiction status - 7**	7. Addiction status
9. Family relationships	**9. Family relationships - 8**	8. Family relationships
10. Mental health	**10. Mental health – 9**	9. Mental health
11. Social health	**11. Social health – 10**	10. Social health
12. Access to health services	**12a. Access to health services - 11**	11. Access to health services
	12b. Barriers to Health Services - 12	12. Barriers to Health Services
13. Financial status	13. Financial status – **Economic health -13**	13. Economic health
14. Housing	**14. Housing security**	14. Housing security
15. Self-worth	15. Self worth # 4 Emotional, #15 self-sufficiency, & #22 Work	
16. Emotional health negative	16. Emotional health Negative #4 Emotional health	
17. Personal hygiene	17. Personal hygiene #17 Health maintenance	
18. Trust	18. Trust #4 Emotional & #10 Social health	
19. Independent/ self determining	19. Independent/ **self** determining **sufficiency – 15**	15. Self-sufficiency
20. Social support	**20. Social support - 16**	16. Social support
21. Health maintenance/ Doing the work of health	**22. Health maintenance/ Doing the work of health – 17**	17. Health maintenance/ Doing the work of health
22. Environmental health	**23. Environmental health - 18**	18. Environmental health
23. Respite from homelessness	Respite from homelessness #17 Health maintenance	
24. Relationship with health workers	**24. Relationship with health workers – 19**	19. Relationship with health workers
25. Spiritual health	**25. Spiritual health - 20**	20. Spiritual health
26. Street survival skills	**26. Street survival skills -21**	21. Street survival skills
27. Work	**27. Work - 22**	22. Work
28. Education	**28. Education – 23**	23. Education

Table H2. Data reduction 3.

Appendix H

Data Reduction in Secondary Analysis

Reduction 3: 23 Health Determinants	Reduction 4: 18 Health Determinants	Reduction 4: 18 Health Determinants
1. **Food security**	1. Food security	1. Food security
2. **Not being sick**	2. Not being sick	2. Not being sick
3. **Physical fitness**	3. Physical health & fitness	3. Physical health & fitness
4. **Emotional health**	4. Emotional health	4. Emotional health
5. Physical health	5. ~~Physical health~~ #3 Physical health & fitness	
6. Role functioning	6. **Role functioning – 5**	5. Role functioning
7. Addiction status	7. **Addiction status – 6**	6. Addiction status
8. Family relationships	8. **Family relationships - 7**	7. Family relationships
9. Mental health	9. **Mental health – 8**	8. Mental health
10. Social health	10. **Social health – 9**	9. Social health
11. Access to health services	11. **Barriers to Accessing health services – 10**	10. Barriers to accessing health services
12. Barriers to Health Services	12. ~~Barriers to Health Services~~ #10 Barriers to accessing health services	
13. Economic health	13. **Economic health -11**	11. Economic health
14. Housing security	14. **Housing security – 12**	12. Housing security
15. Self-sufficiency	15. **Self-sufficiency – 13**	13. Self-sufficiency
16. Social support	16. **Social support – 14**	14. Social support
17. Health maintenance/ Doing the work of health	17. **Health maintenance/ Doing the work of health -15**	15. Health maintenance
18. Environmental health	18. ~~Environmental health~~ (# 9 Social health & #17 Health maintenance)	
19. Relationship with health workers	19. ~~Relationship with health workers~~ #10 Barriers to accessing health services	
20. Spiritual health	20. **Spiritual health – 16**	16. Spiritual health
21. Street survival skills	21. **Street survival skills -17**	17. Street survival skills
22. Work	22. **Work & Education -18**	18. Work Security & Education
23. Education	23. ~~Education~~ #22 Work & Education	

Table H3. Data reduction 4.

Appendix I

Evolving Health Determinant Structure for Homeless Persons

Health Dimensions =6
Emotional Health (31)
Physical Health & Fitness (13)
Mental Health (9)
Social Health (15)
Economic Health (10)
Spiritual Health (8)

Personal Health Practices =3
Addiction Status (13)
Health Maintenance (20)
Street Survival Skills (16)

Health Services =1
Barriers to Accessing Health Services (34)

Basic Human Needs =3
Food Security (11)
Not being Sick (9)
Housing Security (15)

Personal Role Expectations =3
Role Functioning (8)
Self-sufficiency (10)
Work Security & Education (20)

Social Support Networks =2
Social Support (14)
Family Relationships (12)

Items / Questions: **268**   *Health Determinants:* **18**

Figure I1. Health determinant structure at the end of Stage 1: Item Generation.

Health Dimensions =6
Emotional Health (32)
Physical Health & Fitness (11)
Mental Health (7)
Social Health (13)
Economic Health (9)
Spiritual Health (7)

Personal Health Practices =3
Addiction Status (20)
Health Maintenance (15)
Street Survival Skills (12)

Health Services =1
Access to Health Services (13)

Basic Human Needs =3
Food Security (10)
Not being Sick (10)
Housing Security (17)

Personal Role Expectations =3
Role Functioning (7)
Self-sufficiency (8)
Work Security & Education (18)

Social Support Networks =2
Social Support (11)
Family Relationships (11)

Items / Questions: **245**   *Health Determinants:* **18**

Figure I2. Health determinant structure at the end of Stage 2: Item Interpretability.

Appendix I
Evolving Health Determinant Structure for Homeless Persons

Health Dimensions =5
Emotional Health (21)
~~Physical Health & Fitness~~
Mental Health (4)
Social Health (6)
Economic Health (5)
Spiritual Health (5)

Personal Health Practices =3
Addiction Status (13)
Health Maintenance (12)
Street Survival Skills (6)

Health Services =1
Barriers to Accessing Health Services (24)

Basic Human Needs =3
Food Security (7)
Not being Sick (10)
Housing Security (13)

Personal Role Expectations =2
~~Role Functioning~~
Self-sufficiency (6)
Work Security & Education (11)

Social Support Networks =2
Social Support (6)
Family Relationships (6)

*Items / Questions***: 155**   *Health Determinants:* **16**

Figure I3. Health determinant structure at the end of content validation with homeless persons in Stage 4.

Health Dimensions =6
Emotional Health (19)
Soundness of Body (11)
Mental Health (4)
Spiritual Health (4)
Socioeconomic Health (17)
Family Connections (6)

Personal Health Practices =2
Addiction Situation (12)
Health Promotion (11)

Basic Human Needs =3
Nutrition & Food Supply (7)
Housing Situation (7)
Work & School Situation (11)

Health Services =1
Access to Health Services (11+2)

*Items / Questions***: 122 - 120 continuous and 2 categorical variables**
Health Determinants: **12**

Figure I4. Health determinant structure after content validation of assessment 1 byclinical and research nurse experts in Stage 4.

Appendix I
Evolving Health Determinant Structure for Homeless Persons

Health Dimensions =6   *Basic Human Needs =3*
Emotional Health (19)   **Nutrition & Food Supply (7)**
Soundness of Body (10)   **Housing Situation (7)**
Mental Health (4)   **Work & School Situation (10)**
Spiritual Health (4)
Socioeconomic Health (17)
   Family Connections (6)

Personal Health Practices =2   *Health Services =1*
Addiction Situation (13)   **Access to Health Services (11 + 4)**
Health Promotion (9)

*Items / Questions***: 121 - 117 continuous and 4 categorical variables**
Health Determinants: **12**

Figure I5. Health determinant structure after content validation of assessment 2 by clinical and research nurse experts at the end of Stage 4.

MASHH:
McCormack Assessment Scale for Homeless Health

Thank you for participating in the development of this new health evaluation tool. The reason for developing this tool is to name the things that make a difference in the health experiences of persons who are homeless or persons who do not have an address.

In this health evaluation tool, health is viewed from many viewpoints and includes factors that might help you to be healthy or factors that might cause you problems as you try to stay healthy. All of the viewpoints help make a more complete picture of your health. When all questions are answered, we have a more complete picture of your health.

All information will be kept by the researcher and your name will not be given to anyone. Your name will not appear on the health form used in this study. A number code will be used on all health forms.

Nurse Researcher: Dianne McCormack, RN, PhD Candidate
School of Nursing, McGill University
And   Professor, Department of Nursing
University of New Brunswick in Saint John

Respondent Code: _____

Interviewer: _____

McCormack Assessment Scale for Homeless Health: MASHH

The following questions are about health situations. Think about your own health during the past two weeks and rate how true each question is for you. There is no right or wrong answers. Please circle the number that best describes how each question fits with your experience.

If the Question is true for you *none of the time*, circle 1.
If the Question is true for you *a little of the time*, circle 2.
If the Question is true for you *some of the time*, circle 3.
If the Question is true for you *most of the time*, circle 4.
If the Question is true for you *all of the time*, circle 5.

Nutrition & Food Supply

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
1 take vitamin pills?	1	2	3	4	5	
2 eat food from each of the food groups every day?	1	2	3	4	5	
3 eat at least three meals a day?	1	2	3	4	5	
4 drink enough water?	1	2	3	4	5	
5 have a steady diet with regular meal hours?	1	2	3	4	5	
6 eat the right amount of food for your activity?	1	2	3	4	5	
7 go any days without food?	1	2	3	4	5	

Housing Situation

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
8 have a safe place to keep your things?	1	2	3	4	5	
9 have a safe place to hang out during the day?	1	2	3	4	5	
10 have a safe place to sleep?	1	2	3	4	5	
11 use public places for shelter? [eg. bus stops, doorways, etc.]	1	2	3	4	5	
12 stay with family or friends (couch surfing)?	1	2	3	4	5	
13 stay in a shelter for the homeless?	1	2	3	4	5	
14 sleep rough or stay in a place not intended for sleeping (squat)? [eg. a car, abandoned building, etc.]	1	2	3	4	5	

Soundness of Body - Not being Sick

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
15 experience sickness that stopped you from doing things you wanted to do?	1	2	3	4	5	
16 need to go to the hospital?	1	2	3	4	5	
17 have a fast recovery from illnesses or sickness?	1	2	3	4	5	
18 have a chronic illness that needed watching? [eg. special diet, high blood pressure, etc.]	1	2	3	4	5	
19 need to take any medication?	1	2	3	4	5	
20 keep prescribed medication safe?	1	2	3	4	5	
21 experience a problem with a disability?	1	2	3	4	5	
22 avoid getting any injuries?	1	2	3	4	5	
23 have a change in your body weight?	1	2	3	4	5	
24 have good physical body function?	1	2	3	4	5	

Family Connections

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
25 stay in contact with family?	1	2	3	4	5	
If the answer is 1 skip to question 27						
26 have family members who looked out for you?	1	2	3	4	5	
27 feel trapped in a relationship with a partner or friend?	1	2	3	4	5	
28 think about childhood abuse that you may have experienced?	1	2	3	4	5	
29 think about an experience you may have had with childhood abandonment?	1	2	3	4	5	
30 remember having a healthy childhood?	1	2	3	4	5	

Emotional Health

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
31 feel that you were in charge of your life?	1	2	3	4	5	
32 experience being happy?	1	2	3	4	5	
33 feel that you were loved?	1	2	3	4	5	
34 have worries?	1	2	3	4	5	
35 feel afraid to trust people?	1	2	3	4	5	
36 know somebody that you could trust?	1	2	3	4	5	
37 keep sadness inside?	1	2	3	4	5	
38 feel shame about your living situation?	1	2	3	4	5	
39 need to control your anger?	1	2	3	4	5	
40 have to deal with many difficult things at once?	1	2	3	4	5	
41 feel lonely?	1	2	3	4	5	
42 feel that you were always on edge or tense?	1	2	3	4	5	
43 feel tired of living?	1	2	3	4	5	
44 keep a sense of humor?	1	2	3	4	5	
45 have self respect?	1	2	3	4	5	
46 avoid dealing with your problems?	1	2	3	4	5	
47 have hope that things would get better?	1	2	3	4	5	
48 get motivated to do the things you wanted to do?	1	2	3	4	5	
49 accept the things that were out of your control?	1	2	3	4	5	

Spiritual Health

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
50 pray?	1	2	3	4	5	
51 take time to think quietly about your life?	1	2	3	4	5	
52 practice your faith?	1	2	3	4	5	
53 have faith in a higher power?	1	2	3	4	5	

Addiction Situation

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
54 smoke cigarettes?	1	2	3	4	5	

If the answer is 1 skip to question 57

55 want to quit smoking?	1	2	3	4	5	
56 cut down on your smoking?	1	2	3	4	5	
57 drink alcohol?	1	2	3	4	5	

If the answer is 1 skip to question 59

58 want to stop drinking alcohol?	1	2	3	4	5	
59 use street drugs?	1	2	3	4	5	
60 use prescription drugs to get high?	1	2	3	4	5	

If the answer is 1 to questions 59 and 60, skip to question 62

61 use clean needles?	1	2	3	4	5	

If the answer to questions 57, 59, and 60 is 1 skip to question 66

62 wonder about where to get the next drink or fix?	1	2	3	4	5	
63 have concerns about drug or alcohol withdrawal?	1	2	3	4	5	
64 try to get into a drug or alcohol treatment program? [eg. detox, methodone, etc.]	1	2	3	4	5	
65 attend groups for people with addictions? [eg. Alcoholics Anonymous (AA), Narcotics Anonymous (NA), etc.]	1	2	3	4	5	
66 avoid people who use drugs or drink alcohol?	1	2	3	4	5	

Mental Health

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
67 learn from your own experiences?	1	2	3	4	5	
68. draw on the things that you learned to deal with a problem?	1	2	3	4	5	
69. do activities to keep your mind active?	1	2	3	4	5	
70. make all your own decisions?	1	2	3	4	5	

Health Promotion

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
71 keep appointments with health care workers?	1	2	3	4	5	
72 practice safe sex?	1	2	3	4	5	
73 get enough sleep?	1	2	3	4	5	
74 get any health information that you needed?	1	2	3	4	5	
75 have clean clothes?	1	2	3	4	5	
76 wear the right clothes for the weather?	1	2	3	4	5	
77 have personal hygiene supplies? [eg. soap, shampoo, etc.]	1	2	3	4	5	
78 live in a clean environment?	1	2	3	4	5	
79 do any physical activities?	1	2	3	4	5	

Work & School Situation

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
80 work for money?	1	2	3	4	5	
81 work as a volunteer?	1	2	3	4	5	
If the answer to both 80 and 81 is 1 skip to question 88						
82 have a safe place to work?	1	2	3	4	5	
83 get to work on time?	1	2	3	4	5	
84 get on-the-job training?	1	2	3	4	5	
85 have the right clothes for work?	1	2	3	4	5	
86 work well with others?	1	2	3	4	5	
87 feel good about a job well done?	1	2	3	4	5	
88 need help to find work?	1	2	3	4	5	
89 go to school?	1	2	3	4	5	

Socioeconomic Health

In the past two weeks did you	None of the time	A little of The time	Some of The time	Most of The time	All of The time	
90 get together or hang out with people?	1	2	3	4	5	
91 help friends get things they needed?	1	2	3	4	5	
92 have someone listen to your concerns?	1	2	3	4	5	
93 get any help that made your situation better?	1	2	3	4	5	
94 avoid violent or abusive situations? [eg. fights, crime, etc.]	1	2	3	4	5	
95 find a way to get money?	1	2	3	4	5	
96 have enough money to buy the things you needed?	1	2	3	4	5	
97 keep your identification (ID) papers safe?	1	2	3	4	5	
98 have structure in your day?	1	2	3	4	5	
99 take care of your own needs?	1	2	3	4	5	
100 get hassled by people in authority? [eg. police, security guards, etc.]	1	2	3	4	5	
101 use available community services to meet your needs?	1	2	3	4	5	
102 have to fight for your rights?	1	2	3	4	5	
103 deal with people who looked down on you?	1	2	3	4	5	
104 see yourself as a functional (contributing) member of society?	1	2	3	4	5	
105 have the resources or means to change your situation?	1	2	3	4	5	
106. have transportation to get to places you needed to go? [eg. work, health services, shelter, etc.]	1	2	3	4	5	

Access to Health Services: Health provider includes nurses, doctors, and so on.

107A need to see **If yes to a provider, ask question 107B**		**107B did you have any difficulty getting to see**	
a doctor	yes ___ no ___	a doctor	yes ___ no ___
a specialist	yes ___ no ___	a specialist	yes ___ no ___
an eye doctor	yes ___ no ___	an eye doctor	yes ___ no ___
a nurse	yes ___ no ___	a nurse	yes ___ no ___
a psychiatrist	yes ___ no ___	a psychiatrist	yes ___ no ___
a dentist	yes ___ no ___	a dentist	yes ___ no ___
a social worker	yes ___ no ___	a social worker	yes ___ no ___
a pharmacist	yes ___ no ___	a pharmacist	yes ___ no ___
a mental health counselor	yes ___ no ___	a mental health counselor	yes ___ no ___
a physiotherapist	yes ___ no ___	a physiotherapist	yes ___ no ___
a nurse practitioner	yes ___ no ___	a nurse practitioner	yes ___ no ___
other _____	yes ___ no ___	other _____	yes ___ no ___

108A get admitted to the hospital? **If yes, ask question 108B**	yes ___ no ___	**108B did you have any trouble/snags while being admitted to hospital?**	yes ___ no ___

If no to question 107 and 108, skip to question 115

In the past two weeks did you	**None of the time**	**A little of The time**	**Some of The time**	**Most of The time**	**All of The time**	
109 have to fill out a lot of paper work in order to get help?	1	2	3	4	5	
110 have to wait a long time to get the help you needed?	1	2	3	4	5	
111 feel that you got honest answers from health providers?	1	2	3	4	5	
112 see a health provider who listened to your concerns?	1	2	3	4	5	
113 feel that your health information was kept private?	1	2	3	4	5	
114 see a health provider at the shelter or drop-in?	1	2	3	4	5	
115 know where to go to get any needed health services?	1	2	3	4	5	
116 have a *medicare* card?	1	2	3	4	5	
117 have other medical benefits or health insurance?	1	2	3	4	5	
118 ask social assistance to help you get a family doctor?	1	2	3	4	5	
119 get your health needs addressed?	1	2	3	4	5	

Appendix K

Demographic Profile for Respondents in Stage 5

	16-21	21-30	31-40	41-50	51-60	61-70	71-80
■ Female	11	18	6	12	4	0	0
■ Male	5	32	26	36	10	7	1

Figure K1. Respondent age and gender.
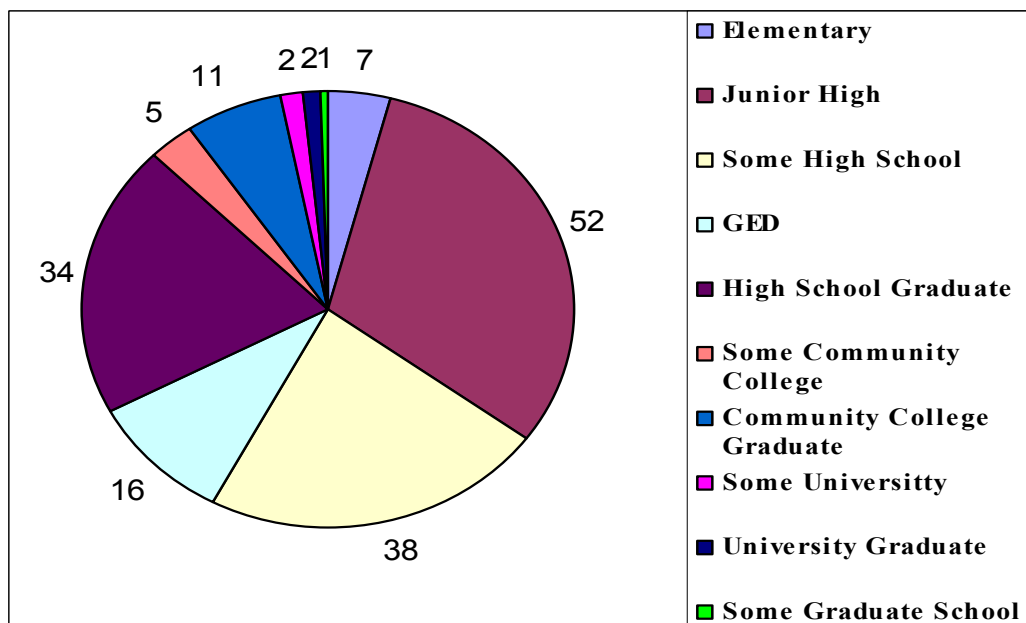
Figure K2. Respondent education.

Appendix K

Demographic Profile for Respondents in Stage 5
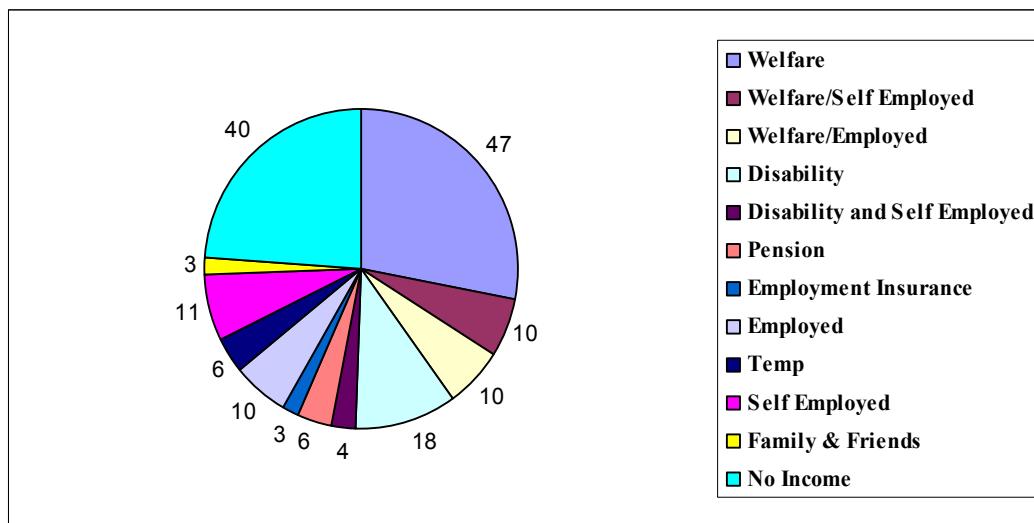
Figure K3. Respondent income.

Appendix L

Data Preparation

12 Factors reduced to 11 Factors - 117 Items reduced to 93 Items

Item	Researcher's Notes Qualitative Data	Histograms Descriptive Stats	Bivariate Correlation >.3 >.2 >.1	Conceptual Sense Scoring Problem	Decision
001		✓ severe skew	(0) (1) (26)		
002					
003					
004					
005					
006					
007			(2) (21) (51)		
008					
009					
010					
011		✓ sig kurtosis	(1) (4) (28)		
012					
013					
014					
015					
016		✓ sig kurtosis	(0) (3) (14)		
017	✓ (add skip option)			✓	Remove & Rework
018			(2) (8) (31)		
019					
020	✓ (add skip option)			✓	Make Categorical
021					
022			(0) (9) (37)		
023				✓	Remove
024					
025			(2) (7) (37)		
026					
027			(2) (15) (51)		
028					
029			(2) (16) (40)		
030			(2) (7) (36)		
031					
032					
033					
034					
035					
036					
037					
038					
039			(1) (13) (43)		
040					
041					
042					
043					
044					
045					
046					
047		✓ sig kurtosis	(1) (4) (46)		
048					
049			(0) (2) (25)		
050					
051					
052					
053					
054		✓ sig kurtosis	(0) (1) (30)		
055				✓	Remove

~~056~~				✓	Remove
057			(0) (3) (36)		
~~058~~				✓	Remove
059					
060		✓ severe skew			
~~061~~	✓ (alter skip option)	✓ severe skew		✓	Make Categorical
062					
063					
~~064~~	✓ (reword)			✓	Make Categorical
~~065~~		✓ sig kurtosis		✓	Make Categorical
066			(1) (6) (34)		
067			(1) (4) (31)		
068	✓ (reword)				
069					
070			(0) (7) (34)		
~~071~~	✓ (time limitation)			✓	Make Categorical
~~072~~	✓ (time limitation)			✓	Make Categorical
073					
~~074~~	✓ (time limitation)			✓	Make Categorical
075		✓ sig kurtosis			
076		✓ sig kurtosis			
077		✓ severe skew			
078					
079			(1) (9) (28)		
080					
081			(2) (4) (28)		
082			(1) (8) (37)		
~~083~~			>9=3; >8=1	✓	Remove -redundant
~~084~~	✓ (irrelevant)			✓	Remove
~~085~~			>9=2; >8=2	✓	Remove- redundant
086					
087					
088			(0) (1) (27)		
~~089~~	✓ (time issue)	✓ severe skew		✓	Remove -seasonal
090					
091			(2) (8) (36)		
092					
093					
094		✓ sig kurtosis	(1) (16) (53)		
095			(1) (16) (47)		
096			(2) (10) (34)		
097		✓ sig kurtosis			
098	✓ (reword)				
099					
100		✓ sig kurtosis	(1) (9) (42)		
101	✓ (reword)		(0) (9) (41)		
102			(2) (6) (39)		
103					
104					
105			(0) (8) (31)		
106					
~~109~~				✓	Remove
~~110~~				✓	Remove
~~111~~				✓	Remove
~~112~~				✓	Remove
~~113~~				✓	Remove
~~114~~		✓ sig kurtosis		✓	Remove
115		✓ sig kurtosis	(1) (11) (30)		
116			(0) (5) (27)		
~~117~~	✓ (irrelevant)	✓ severe skew		✓	Remove
~~118~~	✓ (irrelevant)	✓ severe skew		✓	Remove
119					

Table L1. Data preparation analysis.

Appendix L

Data Preparation

11 Factors – 93 Items

Health Dimensions =6
Emotional Health (19)
Soundness of Body (7)
Mental Health (4)
Spiritual Health (4)
Socioeconomic Health (17)
  Family Connections (6)

Basic Human Needs =3
Nutrition & Food Supply (7)
Housing Situation (7)
Work ~~& School~~ Situation (6)

Personal Health Practices =2
Addiction Situation (7)
Health Promotion (6 + 3)

~~Health Services =1~~
~~**Access to Health Services (11 + 4)**~~

*Items/Questions***: 93 remaining in analysis**
Revised MASHH: 101 items – 93 +1 continuous and 7 categorical
variables
Health Determinants: **11 + 1 (Health Actions & Assets)**

Figure L1. Health structure at the end of data preparation in Stage 5.

Appendix M

Analysis Round 1

11 Factors reduced to 10 Factors - 93 Items reduced to 78 Items

Item	Delete Item Increases Cronbach's Alpha	Corrected Item–Total Correlation <.3	No Factor Loading	Inter-item Correlation >.3 >.2 >.1	Decision
~~001~~	✓	✓ .065	✓	(0) (0) (1)	Make Categorical
002					
003					
004					
005					
006					
007			Soundness of Body	(0) (4) (1)	Maintain
008					
009					
010					
011					
012	✓	✓ .051	Family Connect		Move Family Connections
013	✓	✓ .279		(4) (0) (2)	Maintain
014					
015					
~~016~~	✓	✓ .282	✓	(0) (3) (1)	Remove & Rework
018					
019					
021					
~~022~~	✓	✓ .164	✓	(0) (2) (2)	Make Categorical
024					
025					
026					
~~027~~	✓	✓ .193	✓	(0) (3) (0)	Remove
028			Soundness of Body		Move Soundness of Body
029			Soundness of Body		Move Soundness of Body
030					
031					
032					
033					
034					
035					
036					
037					
038					
~~039~~	✓	✓ .278	✓	(1) (4) (9)	Remove
040					
041					
042					
043					
044					
045					
046					
~~047~~	✓	✓ .202	✓	(1) (2) (5)	Remove
048			✓	(5) (6) (7)	Maintain
~~049~~	✓	✓ .150	✓	(0) (1) (6)	Remove
050					
051					
052					
053					

~~054~~	✓	✓ .139	✓	(0) (0) (3)	Make Categorical
~~057~~	✓	✓ .219		(0) (2) (2)	Make Categorical
	✓	✓ -.214	Childhood HX	(0) (1) (2)	
059					
060					
062					
063					
066					
067			✓		
068			✓		
069					
~~070~~	✓	✓ .080	✓	(0) (0) (0)	Remove
073			✓		Move Living Environment
075			Housing Situation		Move Living Environment
076			Housing Situation		Move Living Environment
077			Housing Situation		Move Living Environment
078			Housing Situation		Move Living Environment
~~079~~	✓ low alpha .537	✓ .076 ✓ .236	mixed factor	(0) (0) (1) (0) (0) (3)	Make Categorical
080					
081					
~~082~~	✓	✓ .178	✓	(1) (1) (2)	Remove
086					
087					
~~088~~	✓	✓ .075	✓	(0) (0) (1)	Remove
090		✓ .264			
091		✓ .247			
092					
093					
~~094~~	✓	✓ .185 / .138	✓	(0) (1) (3)	Remove *
095		✓ .202			
096					
097		✓ .175	Housing Situation		Move Living Environment
098					
099					
100		✓ .161	Soundness of Body		Move Soundness of Body
101		✓ .270			
102	✓ ✗	✓ .022 /	Soundness of Body		Move Soundness of Body **
~~103~~	✓	✓ -.017	✓	(0) (0) (3)	Remove
104					
105		✓ .254			
106					
115			mixed factor		Maintain - Mental Health?
116	✓	✓ .176	Housing Situation		Move Living Environment
119			mixed factor		Maintain - Mental Health?

Table M 1. Iterative process: Round 1 analysis.

Appendix M

Analysis Round 1

10 Factors – 78 Items

Health Dimensions =6   *Basic Human Needs =3*

Emotional Health (16)   ~~Nutrition &~~ **Food** ~~Supply~~ **Insecurity (6)**

Soundness of Body (9)   ~~Housing Situation (7)~~

Mental Health (5)   **Living Environment (12 +1)**

Spiritual Health (4)   **Work Situation (4)**

Socioeconomic Health (12)

   Family Connections (4)

Personal Health Practices =1

Addiction Situation (5)

~~Health Promotion (6 + 3)~~

*Items/Questions***: 78 remaining in analysis**

Revised MASHH: 92 items – 78 +2 continuous and 12 categorical variables

Health Determinants: **10 + 1 (Health Actions & Assets)**

Figure M1. Health structure at the end of iterative process: Round 1 analysis in Stage 5.

Appendix N

Analysis Round 2

10 Factors -78 Items reduced to 71 Items

Item	Delete Item Increases Cronbach's Alpha	Corrected Item – Total Correlation < .3	No Factor Loading	Inter-Item Correlation >.3 >.2 >.1	Decision
002					
003					
004	✓				
005					
006					
007	✓		Emotional Health	(0) (4) (1)	Maintain
008					
009					
010					
011	✓	✓ .298			
013					
014					
073			✓		
075					
076					
077					
078					
097					
116	✓				
015					
018					
019					
021					
024					
028					
029					
~~100~~	✓	✓ .236	✓	(1) (1) (3)	Remove
102			Social Health		Maintain
012	✓				
025					
026					
030	✓		Soundness of Body		Move Soundness of Body
031					
032					
033					
034					
035					
036	✓	✓ .236	✓	(2) (5) (6)	Maintain ? Social Health
037					
038					
040					
041					
042					
043					
044		✓ .294	Social Health		Move Social Health
045			Mental Health		Move Mental Health

046		✓ .269			
048		✓ .248	Mental Health		Move Mental Health
050					
051					
052					
053					
059					
060					
062					
063					
066	✓				
067			✓		
068					
069	✓				
080	✓				
081	✓				
086					
087					
090					
091					
092					
~~093~~			✓		Remove
~~095~~	✓	✓ .296 ✓ .279	Addiction Situation	(1) (1) (6) (0) (3) (2)	Remove
~~096~~			✓		Make Categorical
098		✓ .284	Mental Health		Move Mental Health
099			Mental Health		Move Mental Health
~~101~~			✓		Make Categorical
104			Mental Health		Move Mental Health
~~105~~		✓ .245	✓		Make Categorical
~~106~~			✓		Make Categorical
115			Mental Health		Move Mental Health
119	✓		Mental Health		Move Mental Health

Table N1. Iterative process: Round 2 analysis.

Health Dimensions =6   *Basic Human Needs =3*
Emotional Health (13)   **Food Insecurity (6)**
Soundness of Body (9)   **Living Environment (13)**
Mental Health (10)   **Work Situation (4)**
Spiritual Health (4)
Social~~oeconomic~~ Health (4)   *Personal Health Practices =1*
   Family Connections (3)   **Addiction Situation (5)**

Figure N1. Health structure at the end of iterative process: Round 2 analysis in stage 5.

Appendix O

Analysis Round 3

10 Factors -71 Items reduced to 62 Items

Item	Delete Item Increases Cronbach's Alpha	Corrected Item – Total Correlation < .3	No Factor Loading	Inter-Item Correlation >.3 >.2 >.1	Decision
Food Supply (4) (.808)					
002					
003					
~~004~~	✓(.788 to .808)			(3) (1) (1)	Covert to Categorical
005					
006					
~~007~~	✓(.781 to .788)		✓	(0) (4) (1)	Covert to Categorical *
Living Environment (12) (.831)					
008					
009					
010					
011	✓ (.832)				
013					
014					
~~073~~	increases alpha (.831 to .833)		✓	(3) (6) (0)	Covert to Categorical**
075					
076					
077					
078					
097					
116					
Soundness of Body (7) (.742)					
015					
018					
019					
021					
024					
028					
029					
~~030~~	✓(.734 to .742)	✓ .232	Work Situation	(2) (0) (2)	Remove***
~~102~~	✓(.729 to .734)	✓ .227	✓	(0) (2) (4)	Remove *
Family Connections (3) (.778)					
012	✓ (.876)				
025					
026					
Emotional Health (12) (.854)					
031					
032					
033					
034					

035					
~~036~~	✓		✓	(2) (3) (5)	Remove **
037					
038					
040					
041					
042					
043					
046					
Spiritual Health (4) (.761)					
050					
051					
052					
053					
Addiction Situation (4) (.827)					
059					
060					
062					
063					
~~066~~	✓(.785 to .827)				Remove
Mental Health (8+1=9) (.762)					
045					
048					
067		✓ .297	✓ and Living Environment		Maintain
068					
069					
098					
099					
104					
~~115~~	✓(.757 to .762)				Remove
~~119~~	✓(.750 to .757)				Remove
Work Situation (4) (.803)					
080	✓ (.834)				
081	✓ (.856)				
086					
087					
Social Health (4) (.701)					
044	✓ (.701)	✓ .257	Mental Health	(0) (2) (1)	Move Mental Health
090					
091					
092					

Table O1. Iterative process: Round 3 analysis.

* Item changed determinant ✓ 2, not loading this round

** Item no loading in all rounds

*** Item loaded on a different factor in each round

Appendix O

Analysis Round 3

10 Factors - 62 Items

<div style="border:1px solid black; padding:1em;">

Health Dimensions =6   *Basic Human Needs =3*

Emotional Health (12)   **Food Insecurity (4)**

Soundness of Body (7)   **Living Environment (12)**

Mental Health (9)   **Work Situation (4)**

Spiritual Health (4)

Social Health (3)   *Personal Health Practices =1*

   Family Connections (3)   **Addiction Situation (4)**

Items / Questions: **62 remaining in analysis**

Revised MASHH: 84 items – 62 + 2 continuous and 20 categorical

variables

Health Determinants: **10 + 1 (Health Actions & Assets)**

</div>

Figure O1. Health structure at the end of iterative process: Round 3 analysis in Stage 5.

Appendix P

Analysis Round 4

10 Factors -62 Items reduced to 60 Items

Item	Delete Item Increases Cronbach's Alpha	Corrected Item – Total Correlation < 3	No Factor Loading	Inter-Item Correlation >.3 >.2 >.1	Decision
Food Supply (4) (.808)					
002					
003					
005					
006					
Living Environment (12) (.831)					
008					
009					
010					
011	✓ (.832)				
013					
014					
075					
076					
077					
078					
097					
116					
Soundness of Body (7) (.742)					
015					
018					
019					
021					
024					
028	increases alpha (.727 to .742)		✓	(2) (2) (1)	Maintain
029					
Family Connections (3) (.778)					
012	✓ (.876)				
025					
026					
Emotional Health (11) (.849)					
031					
032					
033					
034					
035					
037					
038					
040					
041					
042					
043					
~~046~~	increases alpha (.849 to .854)		✓	(4) (5) (2)	Remove

Spiritual Health (4) (.761)					
050					
051					
052					
053					
Addiction Situation (4) (.827)					
059					
060					
062					
063					
Mental Health (8) (.760)					
~~044~~	increases alpha (.760 to .762)		✓	(1) (2) (4)	Remove
045					
048					
067					
068					
069					
098					
099					
104					
Work Situation (4) (.803)					
080	✓ (.834)				
081	✓ (.856)				
086					
087					
Social Health (3) (.701)					
090					
091					
092					

Table P1. Iterative process: Round 3 analysis.

Health Dimensions =6   *Basic Human Needs =3*
Emotional Health (11)   **Food Insecurity (4)**
Soundness of Body (7)   **Living Environment (12)**
Mental Health (8)   **Work Situation (4)**
Spiritual Health (4)
Social Health (3)   *Personal Health Practices =1*
   Family Connections (3)   **Addiction Situation (4)**

Items / Questions: **60 remaining in analysis**
Revised MASHH: 82 items – 60 + 2 continuous and 20 categorical variables
Health Determinants: **10 + 1 (Health Actions & Assets)**

Figure P1. Health structure at the end of iterative process: Round 4 analysis in Stage 5.

Appendix Q

Health Determinant: Health Actions & Assets

001 vitamin pills	054 smoke cigarettes
004 adequate water	057 drink alcohol
007 days without food	061 clean needles
020 medication security	064 substance treatment
022 injury prevention	065 substance group
071 keep appointments	096 enough money
072 safe sex	101 use resources
073 enough sleep	106 transportation
074 health information	115 location
079 physical activities	119 needs addressed

Table Q1. Items suggested for conversion to categorical variables.