FACTORS PREDICTING PHYSICAL ACTIVITY IN OLDER THAI ADULTS LIVING IN URBAN POOR COMMUNITIES

PHACHONGCHIT KRAITHAWORN

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Phachongchit Kraithaworn

Mrs. Phachongchit Kraithaworn,
Candidate

Yupapin Sirapo-ngam

Assoc. Prof. Yupapin Sirapo-ngam, D. S. N.
Major- advisor

N. Piaseu

Asst. Prof. Noppawan Piaseu, Ph.D.
Co-advisor

Kimberlee A Gretebeck

Asst. Prof. Kimberlee A. Gretebeck, Ph.D.
Co-advisor

Dechavudh Nityasuddhi

Assoc. Prof. Dechavudh Nityasuddhi, Ph.D.
Co-advisor

B. Mahaisavariya

Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

Rutja Phuphaibul

Prof. Rutja Phuphaibul, D. N. S.
Program Director
Doctor of Philosophy Program in Nursing
Faculty of Medicine, Ramathibodi Hospital
Mahidol University

Thesis
entitled

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on
April 2, 2010

Phachongchit Kraithaworn
Mrs. Phachongchit Kraithaworn,
Candidate

Nantawon Suwonnaroop
Asst. Prof. Nantawon Suwonnaroop,
Ph.D.
Chair

N. Piaseu
Asst. Prof. Noppawan Piaseu,
Ph.D.
Member

Yupapin Sirapo-ngam
Assoc. Prof. Yupapin Sirapo-ngam,
D. S. N.
Member

Linchong Pothiban
Assoc.Prof. Linchong Pothiban,
D. S. N.
Member

Kimberlee A. Gretebeck
Asst. Prof. Kimberlee A. Gretebeck,
Ph.D.
Member

Dechavudh Nityasuddhi
Assoc. Prof. Dechavudh Nityasuddhi,
Ph.D.
Member

Fongcum Tilokskulchai
Assoc. Prof. Fongcum Tilokskulchai, Ph.D.
Dean
Faculty of Nursing Mahidol University

B. Mahaisavariya
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

Prof.Winit Phuapradit,M.D.
Deputy Dean,Acting Dean,
Faculty of Medicine Ramathibodi Hospital,
Mahidol University

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Phachongchit Kraithaworn

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PHACHONGCHIT KRAITHAWORN 4836650 NRNS/D

Ph.D. (NURSING)

THESIS ADVISORY COMMITTEE: YUPAPIN SIRAPO-NGAM, RN., D.S.N., NOPPAWAN PIASEU, RN., Ph.D., KIMBERLEE A. GRETEBECK., RN., Ph.D., DECHAVUDH NITYASUDDHI, Ph.D.

ABSTRACT

The purpose of this cross sectional descriptive study was to determine the factors predicting physical activity in older Thai adults living in urban poor communities including physical activity self-efficacy, social support, perceived physical health, perceived mental health, a sense of community, and the neighborhood environment and facilities. The model was based on the Pender Health Promotion Model and the Social Ecological Model. Multi-stage random sampling was used to obtain a sample of 258 older adults living in urban poor communities throughout Bangkok Metropolitan. The structured interview was employed with eight questionnaires including: the demographic questionnaire, the Modified Physical Activity for Older Thai Adults Questionnaire, the Physical Activity Self-Efficacy Questionnaire, the Social Support for Physical Activity Questionnaire, the Neighborhood Environment Scale, the Sense of Community Scale, the Short Form-36 Health Survey (SF 36: the physical composite summary), and the Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population. The data were analyzed by descriptive statistics and Path analysis.

The results indicated that the final model fit the data well and explained 33% of the variance in physical activity, 51% of the variance in physical activity self-efficacy, and 22% of the variance in a sense of community. Physical activity self-efficacy was the most powerful predictor in explaining physical activity. A sense of community and perceived physical health had a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy. Perceived mental health had a negative indirect effect on physical activity through physical activity self-efficacy but had a positive direct effect on physical activity. Neither social support nor neighborhood environment and facilities significantly predicted physical activity; however, social support had a positive indirect effect on physical activity through a sense of community, and neighborhood environment and facilities had a positive indirect effect on physical activity through a sense of community and physical activity self-efficacy.

The findings suggest that enhancing physical activity self-efficacy, a sense of community, and perceived physical health can increase physical activity in this population. The knowledge gained from this study provides a greater understanding of the determinants of physical activity for older Thai adults living in urban poor communities, which can be used to develop an effective intervention or guideline for promoting physical activity and can also be used as a source for further study.

KEY WORDS: PHYSICAL ACTIVITY/ OLDER THAI ADULTS/ URBAN POOR COMMUNITIES/ A SENSE OF COMMUNITY / PHYSICAL ACTIVITY SELF-EFFICACY

193 pages

ปัจจัยทำนายกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุไทยที่อาศัยอยู่ในชุมชนแออัด เขตเมือง

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ผจงจิต ไกรถาวร 4836650 NRNS/D

ปร.ด. (การพยาบาล)

คณะกรรมการที่ปรึกษาวิทยานิพนธ์: ยุพาพิน ศิรโพธิ์งาม, D.S.N, นพวรรณ เปียซื่อ, Ph. D., KIMBERLEE A. GRETEBECK., Ph. D., เดชาวุธ นิตยสุทธิ, Ph. D.

บทคัดย่อ

การวิจัยนี้เป็นการศึกษาภาคตัดขวาง มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์เชิงสาเหตุของ การรับรู้สมรรถนะในตนด้านการทำกิจกรรมการเคลื่อนไหวออกแรง การสนับสนุนทางสังคม การรับรู้สุขภาพกาย การรับรู้สุขภาพจิต ความรู้สึกเป็นส่วนหนึ่งของชุมชน และ การรับรู้สภาพสิ่งแวดล้อมละแวกบ้าน ต่อการทำกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุไทย ที่อาศัยอยู่ในชุมชนแออัด เขตเมือง โดยใช้กรอบแนวคิด การส่งเสริมสุขภาพของเพนเดอร์ และกรอบแนวคิด เชิงนิเวศน์วิทยา กลุ่มตัวอย่าง คือ ผู้สูงอายุที่มีอายุตั้งแต่ 60 ปีขึ้นไป ที่อาศัยอยู่ในชุมชนแออัด กรุงเทพมหานคร จำนวน 258 คน คัดเลือกกลุ่มตัวอย่างโดยใช้การสุ่มตัวอย่างแบบหลายขั้นตอน กลุ่มตัวอย่างได้รับการสัมภาษณ์ด้วยแบบสอบถาม 8 ชุด คือ แบบบันทึกข้อมูลทั่วไป แบบสอบถามกิจกรรมการเคลื่อนไหวออกแรงและออกกำลังกายของผู้สูงอายุไทย แบบสอบถามการรับรู้สมรรถนะในตนด้านการทำกิจกรรมการเคลื่อนไหวออกแรง แบบสอบถามการสนับสนุนทางสังคม แบบสอบถามการรับรู้สภาพสิ่งแวดล้อมละแวกบ้าน แบบสอบถามความรู้สึกเป็นส่วนหนึ่งของชุมชน แบบสอบถาม เอส เอฟ 36 (หมวดประเมินสุขภาพกาย) และ แบบสอบถามปัญหาสุขภาพ: แบบวัดด้วยตนเองเพื่อตรวจวัดหาโรคซึมเศร้าในประชากรไทย วิเคราะห์ข้อมูลด้วยสถิติขั้นพื้นฐาน และการวิเคราะห์อิทธิพล

ผลการศึกษา พบว่า แบบจำลองสุดท้ายที่ปรับมีความสอดคล้องกับข้อมูลเชิงประจักษ์ และสามารถทำนายความผันแปรของการทำกิจกรรมการเคลื่อนไหวออกแรง การรับรู้สมรรถนะในตน และความรู้สึกเป็นส่วนหนึ่งของชุมชนของผู้สูงอายุไทยที่อาศัยอยู่ในชุมชนแออัด เขตเมือง ได้ 33%, 51% และ 22% ตามลำดับ การรับรู้สมรรถนะในตนทำนายการทำกิจกรรมการเคลื่อนไหวออกแรงได้ดีที่สุด ทั้งนี้ความรู้สึกเป็นส่วนหนึ่งของชุมชน และการรับรู้สุขภาพกายมีอิทธิพลโดยตรงทางบวกต่อการทำกิจกรรมการเคลื่อนไหวออกแรง และมีอิทธิพลโดยอ้อมทางบวกต่อการทำกิจกรรมการเคลื่อนไหวออกแรงผ่านการรับรู้สมรรถนะในตน การรับรู้สุขภาพจิต มีอิทธิพลโดยอ้อมทางลบต่อการทำกิจกรรมการเคลื่อนไหวออกแรง ผ่านการรับรู้สมรรถนะในตน แต่มีอิทธิพลโดยตรงทางบวกต่อการทำกิจกรรมการเคลื่อนไหวออกแรง แม้ว่าการสนับสนุนทางสังคม และการรับรู้ สภาพสิ่งแวดล้อมละแวกบ้านไม่มีผล โดยตรง ต่อการทำกิจกรรมการเคลื่อนไหวออกแรง แต่การสนับสนุนทางสังคมมีอิทธิพลโดยอ้อมทางบวกต่อการทำกิจกรรมการเคลื่อนไหวออกแรงผ่านความรู้สึกเป็นส่วนหนึ่งของชุมชน ส่วนการรับรู้ สภาพสิ่งแวดล้อมละแวกบ้านมีอิทธิพลโดยอ้อมทางบวกต่อการทำกิจกรรมการเคลื่อนไหวออกแรง ผ่านความรู้สึกเป็นส่วนหนึ่งของชุมชน และการรับรู้สมรรถนะในตน

ผลการศึกษาชี้ให้เห็นว่าการส่งเสริมให้ผู้สูงอายุไทยที่อาศัยอยู่ในชุมชนแออัด เขตเมือง ทำกิจกรรมการเคลื่อนไหวออกแรงได้นั้น ต้องเน้นการพัฒนาการรับรู้สมรรถนะในตนด้านการทำกิจกรรมการเคลื่อนไหวออกแรง ความรู้สึกเป็นส่วนหนึ่งของชุมชน และการรับรู้สุขภาพกาย ซึ่งความรู้ครั้งนี้จะนำไปสู่การพัฒนาโปรแกรมส่งเสริมการทำกิจกรรมทางการเคลื่อนไหวออกแรงที่มีประสิทธิภาพ และเหมาะสมกับบริบทของผู้สูงอายุไทยที่อาศัยอยู่ในชุมชนแออัด เขตเมือง ต่อไป

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CHAPTER I
INTRODUCTION

Background and Significance of the Problem

Along with the advances in public health and medical technology, many countries including Thailand experience “an aging population”. Currently, the proportion of Thai people aged 60 years and over has dramatically increased from 6.8 percent in 1994 and 9.4 percent in 2002 to 10.7 percent in 2007 (National Statistical Office, 2007). Also, this proportion will exceed 20 percent in the year 2023 (National Economic and Social Development Board, 2007). This reflects that Thailand has a short time period to deal with many important challenges related to health, welfare, facilities, health care system and long-term care for older people (Thanakwang & Soonthorndhada, 2006).

With the aging population, the prevalence of age-related chronic disease, as well as the development of functional limitation, disability and the rate of dependency is expected to increase and overwhelm social services (National Statistical Office, 2008; The National Commission on the Elderly, 2005). A survey of Health and Welfare by the National Statistical Office in 2005 reported that older Thai adults yielded the largest proportion of chronic diseases. The medical expenses for this group accounted for 95% of the national total medical expenditures (The National Commission on the Elderly, 2005). For this reason, the Thai health care system has to be prepared to deal with the chronic diseases and illnesses of this aging population (Bureau of Policy and Strategy, 2007). One key goal of the Thai public health policy is to maintain older adults’ health and independence in order to improve the quality of life and reduce medical expenses and social costs (Jitapunkul, Chayovan, & Kespichayawattana, 2007).

Empirical evidence has shown that increasing exercise and physical activity are important strategies to improve older adults’ health. It can prevent and/or delay further decline in functional ability and the development of many chronic physical diseases (Bonaiuti et al., 2006; Bouchard, & Blaire, & Haskell, 2007;

Dishman, Washburn, & Health, 2004) and psychological disorders such as depression and anxiety (Dunn, Trivedi, & O'Neal, 2001; Guszkowska, 2004; Sjösten, & Kivelä, 2006; Starkweather, 2007). Moreover, exercise and physical activity can uplift the older adult's psychological well being by providing them a chance for social interaction and increasing feelings of self-mastery and self-efficacy (McAuley, et al., 2007; Zhu, & Chodzko-Zajko, 2003).

Even though evidence has shown great benefits of increased exercise and physical activity, many older adults are unfortunately becoming physically inactive or sedentary (Bennett et al., 2006; Crombie et al., 2004; Dergance et al, 2003; Friis et al., 2003; Gretebeck et al., 2007). In Thailand, less than a half of older Thai adults exercise (41.4%) (National Statistical Office, 2007). Also, most older adults are not meeting the goal of the national health policy (2001) that promotes every adult to perform 30 minutes of moderate physical activity for 5 days per week (Asawachaisuwikrom, 2001; Binhosen, 2003; Chinuntuya, 2001; Poolsawat, 2007; Sumpowthong, 2002). Hence, promoting exercise and physical activity performing in older adults is very important.

Nowadays, many countries including Thailand have many attempts to increase older adults' exercise and physical activity. Research in these areas included both descriptive studies aimed to examine factors predicting physical activity and intervention studies aimed to test the effectiveness of programs to promote exercise and physical activity. The descriptive studies found similar results that exercise and physical activity are complex behaviors influenced by several factors including not only demographic variables such as age and sex (Phokakul et al., 2004), but also psychosocial and environmental variables. Self efficacy (Chinuntuya, 2001; Poolsawat, 2007) and social support (Chinuntuya, 2001) are examples of psychosocial variables that have a strong relationship with exercise and physical activity while environmental variables such as neighborhood environment and convenient facilities also have a strong relationship with these behaviors as well (Asawachaisuwikrom, 2001; Sumpowthong, 2002). In addition a commitment to a plan of exercise, perceived barriers (Chinnutuya, 2001), perceived benefits (Taweeluk, 1999), intention, attitudes, perceived behavioral control (Jitramontree, 2003), and belonging to a senior citizen club (Poolsawat, 2007) are other factors related with older adults' exercise.

Although different predictors of exercise and physical activity of older Thai adults have been examined, our knowledge and understanding of these predictors in those living in urban poor communities which are often viewed as excluded and oppressed components of our society remain scarce. All previous research studies on physical activity so far have involved only those living in urban and rural areas. Because the difference in older adults' living environments and population characteristics including education, lifestyle, cultural background, income, social values, social support, occupation, health status and so on, therefore those results cannot be generalized to this under-studied group. Due to living in poor environment combined with the low level of education and low income of the residents results in low health literacy, these groups may involve with risky behaviors, may have higher rate of chronic disease and mental health problems, low quality of life and premature death than the non poor people (Abercrombie et al., 2008; Fuller, Edwards, Sermsri, & Vorakitphokatorn, 1993; Kittipimpanon, 2006; Limwattananon et al., 2005 cited in Bureau of Policy and Strategy, 2007; Piaseu & Mitchell, 2004; WHO, 2005, 2008).

Furthermore the studies found that these older adults are more likely to be physically inactive or sedentary than those living in opposite conditions (Kamphuis et al., 2007; Koster et al., 2006; Taylor et al., 1998). Some reasons may be due to living in an environment that is perceived as dilapidated and unsafe is an important barrier to physical activity performance (Koster et al., 2006; Taylor et al., 1998). Also the perception of available low quality exercise facilities together with the inability to pay facility fees are other barriers to perform exercise behavior (Bennett et al., 2007; Harrison et al., 2007; Romero, 2005; Wilbur et al., 2003). Since approximately 11 % of Thai dwellers in urban poor communities are older people (Statistical Forecast Bureau, 2007); therefore, study that focuses on this vulnerable under-studied population is needed.

While many physical activity studies were conducted, most previous studies focused attention on assessing only recreational or leisure time physical activity. They have been limited in certain older adults' overall physical activity studies. Since the physical activity recommendation expanded to accumulate the role of both leisure time physical activity and lifestyle physical activity, consequently factors influencing older adults' overall physical activity should be explored.

Moreover, most existing studies both descriptive and intervention studies have focused primarily on intrapersonal and interpersonal factors (Chinuntuya, 2001; Harnirattisai, 2003; Jitramontree, 2003; Klin-ual, 2000; Phokakul et al., 2004; Poolsawat, 2007; Taweeluk, 1999). Environmental factors such as physical environments of the communities which have been identified as one important determinant of older adults' exercise and physical activity have been least thoroughly studied. Additionally, cultural contribution and social environment under the ways of life --a sense of community-- have not yet been studied. A sense of community is important to individuals in all cultures and across the human life span, particularly older people (Byoung-Suk, Sullivan, & Wiley, 1998). The results found that the more individuals experienced a better sense of community, the more they became physically active (Fallen et al., 2005; Voorhees & Young, 2003; Young, Russell, & Powers, 2004). Because a sense of community has not yet been studied in older Thai adults, there is interesting to explore this variable within Thai urban poor context in order to know whether it can predict older adults' physical activity or not.

Another main issue is that previous studies have not considered the interaction among intra personal, inter personal and extra personal factors. Because exercise and physical activity are complex behaviors influenced by several factors and are best understood by using a multidimensional framework (Resnick et al., 2000), these factors might not alone influence physical activity but might have interaction within and across differing levels of environment.

Consequently, in order to fill these gaps of knowledge and ultimately work to increase and/or maintain physical activity in older Thai adults living in urban poor communities, the researcher conducted a study entitled "Factors Predicting Physical Activity in Older Thai Adults Living in Urban Poor Communities". This study was guided by an integrated conceptual model of the Health Promotion Model (HPM) (Pender, 1996; Pender et al., 2006), which is primarily focused on individual and interpersonal factors, and the Social Ecological Model (SEM) (Stokols, 1992, 1996), which is focused on the interaction of the individual with the social and physical environment.

The knowledge gained from this study will provide a greater understanding of factor predicting physical activity in older Thai adults living in urban poor

communities. This information can be used to develop effective intervention and policy in order to promote older adults' physical activity, independency and encourage active living in this specific group.

Conceptual Framework

This study was guided by the revised Health Promotion Model (HPM) (Pender, 1996; Pender et al., 2006) and the Social Ecological Model (Stokols, 1992, 1996). This integrated model proposes to explain why some older adults in urban poor communities still perform physical activity and why some do not. It also explains factors contributing to physical activity in these groups.

The HPM was developed to explain individual characteristics and experiences as well as the behavior-specific cognition and affect may influence behavioral outcomes. There are three major groups of characteristics: 1) individual characteristics and experience (prior related behavior and personal factors); 2) behavior-specific cognitions and affect (perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences and situational influences; and 3) behavioral outcome (commitment to a plan of action, immediate competing demands and preferences and health promoting behavior). The model is proposed that: 1) individual characteristics and experience have both direct and indirect effects on the health promoting behavior through behavior-specific cognitions; 2) behavior-specific cognitions have both direct and indirect effects on the behavior through a commitment to a plan of action; and 3) commitment to a plan of action has a direct effect on behavior.

While the HPM was developed to explain individual characteristics and experiences as well as the behavior-specific cognition and affect may influence behavioral outcomes, the SEM was focused on the nature of individual interactions with their physical and socio cultural surroundings (Stokols, 1992, 1996). The general thesis of the SEM is that environment can shape people's range of behaviors, sometimes promoting and demanding certain actions, and at other times by discouraging or restricting other behaviors (Best et al., 2003). The basic assumptions of this model are: 1) health is influenced by multiple sides of physical and social environments; 2) human environmental interactions happen in varying contexts:

individuals, family systems, workplace and cultural organizations, and communities; and 3) there is interaction within and across differing levels of environment and gatherings of people. The interactions between persons and their environments influence health behaviors. According to this theory, environments can be described in terms of: 1) their physical and social components; 2) their objective (actual) or subjective (perceived) qualities; and 3) their size and/or closeness-distance to individuals and groups.

To date, the HPM has been frequently used and tested in nursing; however, this model has primarily focused on individual determinants as well as on the changing individual and the changing psychological aspects of individual behavior. The existing causal models regarding situational influences, including neighborhood environments and facilities have been given little attention in prior studies of the HPM. Also, the HPM did not propose a social cultural aspect of environment in the model. Therefore, it is helpful when constructing a framework by combining selected concepts from the HPM which are generally testable with selected concepts from the SEM, which focus on the interactions of the individual with the social cultural and physical environment. Important advantages of integrating these two theories are: 1) the two together will provide a more complete understanding of environmental factors that can facilitate or hinder a person's effort to improve physical activity, and 2) an understanding of the dynamic interplay between intrapersonal, interpersonal and extra personal factors in relation to physical activity.

Although there are multiple factors influencing physical activity, in this study the researcher selected variables from the HPM which are: 1) self efficacy derived from behavior specific cognition and affect; 2) perceived physical health and perceived mental health derived from individual characteristics and experiences (personal factors- psychological part); 3) social support derived from behavior specific cognition and affect (interpersonal influences); and 4) neighborhood environments and facilities derived from behavior specific cognition and affect (situational influences) combining with the variable from the SEM which is a sense of community derived from social cultural environment aspect of community into the model. The reasons that why these variables were selected and how these variables were conceptualized into the proposed model are presented below.

Self-efficacy refers to an individual belief in his or her ability to perform specific tasks (Bandura, 1977). Self efficacy influences thoughts, emotional arousal, and actions of the individual. It is the most central and pervasive influences on the choices people make and the amount of effort they apply when they face with barriers or failure (Bandura, 2001). Self efficacy has been proved as a predictor of physical activity (Brassington et al., 2002; Chinuntuya, 2001; Duncan & Mummery, 2005; Jitramontree, 2003; McAuley et al., 2003; Poolsawat, 2007; Resnick et al., 2000; Umstattd & Hallam, 2007). The ability to engage in physical activity in older adults is influenced by their confidence or belief in their own abilities (Bandura, 1997). Even though some simple activities such as walking, stair climbing, and carrying things that young people can easily perform, these activities for older adults may become difficult and challenging (Graves, Pollock, & Carroll, 1994).

Perceived physical health and perceived mental health are other important determinants of older adults' exercise and physical activity (Dunn, 2008, Gee, 2005). Both of them acts as motivational sources for performing actions and is used to reinforce the value of good health by promoting individuals to be interested and to perform healthy behavior in cases who perceived themselves healthy (Pender & Pender, 1987). Not only these two variables directly influence on physical activity, but also influenced the individuals' estimated their capacity or physical activity self-efficacy (Conn et al., 2003; Resnick, 2001). Since one-third of urban poor older adults had physical disabilities, more than a half had at least one additional health problem (Jitapunkul, Bunnag & Ebrahim, 1993; Kittipimpanon, 2006) and one-third had been treated for depression (Jitapunkul et al., 1993); therefore, perceived mental health and perceived physical health are selected into the model and proposed direct effect on physical activity and indirect effect on physical activity through physical activity self-efficacy.

Social support is one component of an interpersonal influence, a cognition focused on the behaviors, beliefs or attitudes of other individuals (Pender, 1996). It influences health and health behaviors through the direct effect and the indirect effect. Social support is often noted as one important predictor of older adults' exercise and physical activity (McAuley et al., 2003; Park, Housemann, & Brownson, 2003). It can enhance self efficacy by strengthening individual confidence to perform physical

activity and then drive physical activity performing (Anderson et al., 2006; McAuley et al., 2003). Although most research studies supported the relationship among these variables, social support in the socio economical disadvantaged group may different owing to different contexts. Therefore in this study, social support was selected in the model.

A sense of community is important to individuals in all cultures and across the human life span, particularly older people (Byoung-Suk, Sullivan, & Wiley, 1998). The results found that the more individuals experienced a better sense of community, the more they became physically active (Fallen et al., 2005; Voorhees & Young, 2003; Young et al., 2004). Social support and a sense of community had different meaning in term of social support is defined when a person feels belonging, is accepted and loved, and feels of a sense of worth (Pender, 1996) while a sense of community is defined as the feeling of commitment and obligation that an individual feels toward community members; feelings of being part of the community; and having a mutual understanding of collective values, beliefs, and interests among community members (Chaskin et al., 2001; McMillan & Chavis, 1986). A sense of community may be strengthened by the actual experiences of social support, but it is not dependent upon it (Pretty et al., 1996). Social support may strengthen a sense of community by reducing feeling of vulnerability and exclusion and also may enhance self efficacy by act as a motivation source for action that in turn drive physical activity performing. Because a sense of community has not yet been studied in older Thai adults, there is interesting to explore this variable within Thai urban poor context in order to know whether it can predict older adults' physical activity or not.

Neighborhood environment and facilities have been identified in many studies as important determinants of exercise and physical activity (Duncan & Mummery, 2005; King et al., 2002**;** Wilcox et al, 2000; Wilcox et al., 2003). These variables may directly influence physical activity or may act as a source of self-efficacy information that can present a facilitative or a restrictive environment which influences self efficacy (Bandura, 2001). Furthermore the perception of environment may impede their neighborhood interactions (Krause, 1996) and relate to the older adults' withdrawal from the neighborhood if they perceived environment problems (Byoung-Suk, Sullivan & Wiley, 1998; Chavis & Wandersman, 1990; Krause, 1996).

On the other hand if older adults feel safe in their communities and have a perceived environment satisfaction, they are more prone to participate with each other and possibly develop further supportive relationships which lead to a greater sense of community (Byoung-Suk, Sullivan & Wiley, 1998; Chavis, & Wandersman, 1990).

In sum, previous findings have revealed that these variables including physical activity self-efficacy, social support, a sense of community, neighborhood environment and facilities, perceived physical health and perceived mental health influence physical activity, the factors influencing physical activity in older Thai adults living in urban poor communities cannot be found. To this point, it should be examined whether these variables can predict physical activity in older Thai adults living in urban poor communities or not. In order to illustrate the linkage among these variables, conceptual framework is showed in Figure 1.

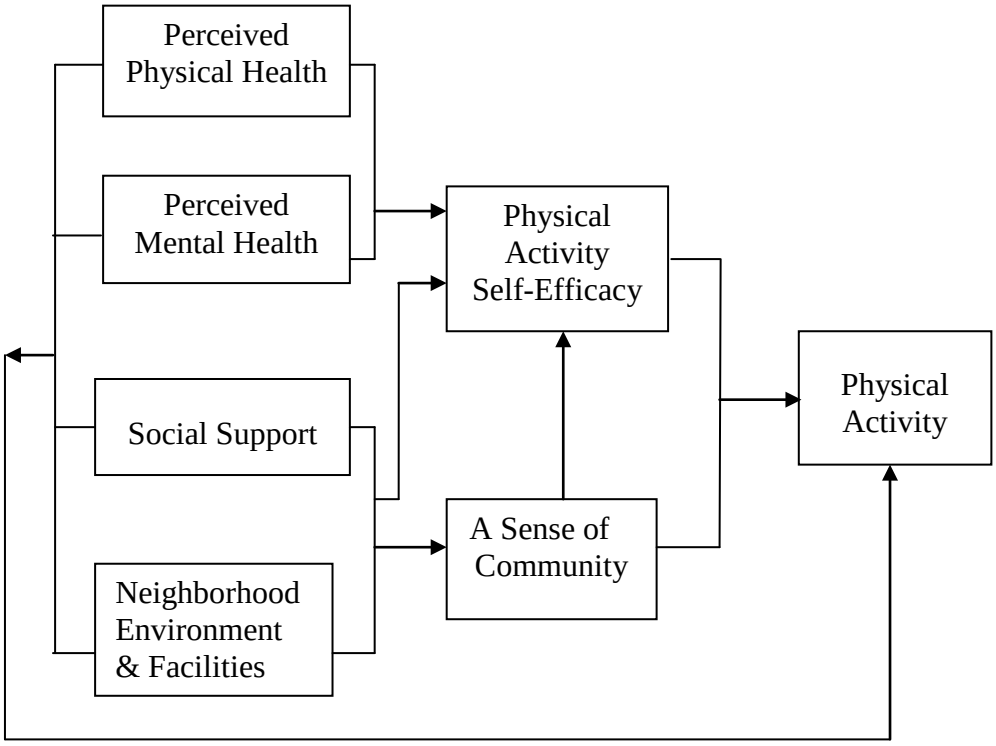

Figure 1: Conceptual Framework of Factors Predicting Physical Activity in Older Thai Adults living in Urban Poor Communities

Therefore, in this study the hypothesized model comprises four exogenous observable variables (social support, perceived physical health, perceived mental

health and the neighborhood environment and facilities) and three endogenous observable variables (physical activity self-efficacy, a sense of community and physical activity). The relationships among these variables are illustrated in Figure 2.

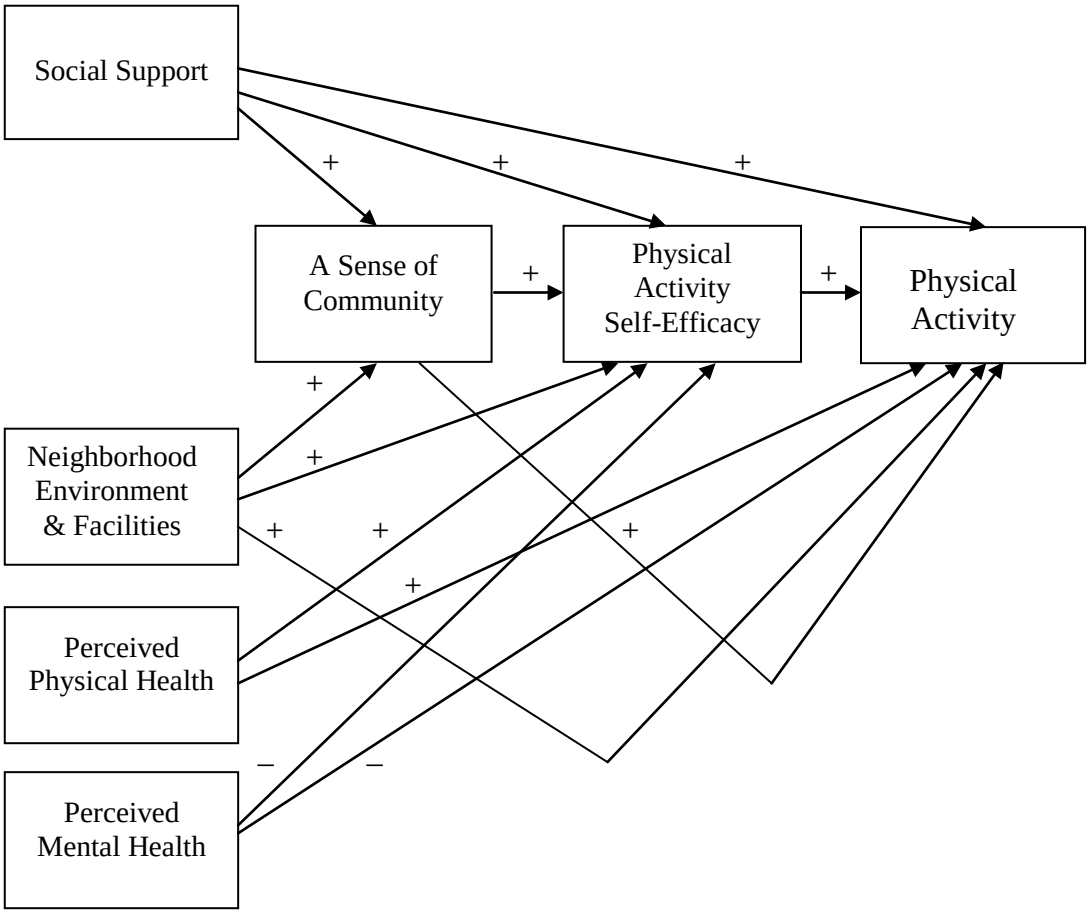

Figure 2: Hypothesized Model of Factors Predicting Physical Activity in Older Thai Adults living in Urban Poor Communities

Research Question

What are the factors predicting physical activity in older Thai adults living in urban poor communities?

Purpose of the Study

To determine the factors predicting physical activity in older Thai adults living in urban poor communities.

Research Hypotheses

1) Physical activity self-efficacy has a positive direct effect on physical activity.

2) Social support has a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy and a sense of community.

3) A sense of community has a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy.

4) Neighborhood environment and facilities have a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy and a sense of community.

5) Perceived physical health has a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy.

6) Perceived mental health has a negative direct effect on physical activity and a negative indirect effect on physical activity through physical activity self-efficacy.

Definition of Terms

Physical Activity is defined as "any bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure above the basal level" (Caspersen, Powell, & Christenson, 1985; USDHHS, 1996). In this study, physical activity refers to all activities in daily life comprising occupational, household, transportation and leisure time (exercise, sport and recreation) activity.

Physical Activity was measured by the Modified Physical Activity Questionnaire for Older Thai Adults modified from the Self Report Physical Activity Questionnaire for Older Thai Adults (Visuthipanich, 2009).

Physical Activity Self-Efficacy is defined as an individual's belief in his or her ability to perform physical activity. It was measured by the Physical Activity

Self-Efficacy Questionnaire, a modified version of the Perceived Self Efficacy for Exercise Questionnaire (Chinuntuya, 2001), which was originally constructed by Pender (1996).

Social Support is defined as an individual's evaluation of the frequency of receiving informational, emotional and tangible support to perform physical activity from family and friends. It was measured by the Social Support for Physical Activity Questionnaire, a modified version of the Social Support for Exercise Questionnaire (Chinuntuya, 2001), which was originally constructed by Pender (1996).

Neighborhood Environment and Facilities refers to one's perception of his or her neighborhood environment and facilities that facilitate or hinder physical activity performing. These variable was measured by the Neighborhood Environment Scale, a modified and translated version of Neighborhood Environment Walk ability Scale (NEWS) - Abbreviated (Cerin, Saelens, Sallis, & Frank, 2006).

A Sense of Community is defined as the feeling of commitment and obligation that an individual feels toward community members; feeling of being part of the community; and having a mutual understanding of collective values, beliefs, and interests among community members (McMillan & Chavis, 1986; Chaskin et al., 2001). It was measured by the Sense of Community Scale which was translated and modified from the Sense of Neighborhood Scale (Young et al., 2004).

Perceived Physical Health is defined as a self evaluation of the physical health well being. It was measured by the physical composite summary of Thai version of the Short Form-36 Health Survey (SF 36) (version2) (Jirarattanaphochai et al., 2005) which was originally constructed by Ware and Sherbourne (1992).

Perceived Mental Health is defined as a self evaluation of the mental health problem. It was measured by the Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population (Kasantikul et al., 1997).

Older Thai Adult is defined as a person living in an urban poor community in Bangkok, Thailand whose age is 60 years or more.

Urban Poor Community is defined as the community where the density is equal to or more than 15 households per rai (1 rai =1,600 square meters) and the environmental conditions are unsanitary, dilapidated, and disorganized which may affect the dwellers' health and safety (Bureau of Social Development, 2008).

CHAPTER II
LITERATURE REVIEW

To provide context for examining factors predicting physical activity in older Thai adults living in urban poor communities, the literature in four areas were reviewed. Those four areas include: 1) older adults and physical activity; 2) physical activity and exercise; 3) urban poor communities; and 4) factor influencing physical activity in older Thai adults living in urban poor communities.

Older Adults and Physical Activity

Several studies revealed that older adults represent the most physically inactive or sedentary segment of the adult population (Health Canada's Division of Aging and Seniors, 2002). There are many reasons that older adults decline in vigorous and/or moderate activities and spend more time in lower intensity activities, which result in a sedentary lifestyle. The most important reason may be due to the age of the older adult accompanied with physical, mental, and social changes, which all together affect physical activity. Physical changes in older adults related to loss of physiological capacity and function such as loss of muscle mass, muscle strength, flexibility (Gee, 2005), body mass index (Hunter, Gwinn & Thompson, 1996; Hurley, 1995), cardio respiratory fitness, and oxidative capacity (Shephard, 2002), which are related to physical activity performance. Individuals can engage in a range of activities depended on their functional ability (Gretebeck et al., 2007). Moreover, chronic conditions, health problems and disabilities associated with aging are reported as significant barriers affecting physical activity performance; older adults who had more chronic conditions, health problems or disabilities are more likely to be inactive than their counterparts (Booth, Bauman, & Owen, 2002; Dawson et al., 2007; Lees et al., 2005; Rasinaho et al., 2006; Shephard, 2002).

For mental changes, the main mental health problems in older adults such as depression, anxiety, and stress are also affect older adults' physical activity. Previous studies indicated that mental health and mood, especially depression, influence exercise and physical activity. Individuals who have depressive symptoms will be sedentary more than those who have no depressive symptoms (Clark et al., 1995; Coday et al, 2002; Dunn, Trivedi & O'Neal, 2001; Wilcox et al., 2003; Wilcox & King, 2004). Regarding social changes, approximately five years after retirement there is a marked decrease of social involvement, including less activity, more sitting down, and disenchantment. Also, social trends and cultural norms expect that older adults should decline their physical activity level as they advance in the aging process. Moreover, older adults themselves may believe that it is "too late" or they are "too old" to perform exercise and physical activity (Asawachaisuwikrom, 2001; Booth et al., 2002; Jitramontree, 2003; Shephard, 2002).

Not only natural changes in older adults lead to a decline in activities and a decrease in the intensity of activity, new technology is one of the leading causes of low physical activity. Many conveniences such as elevators, escalators, internet, remote control, and mobile telephones have made all ages including older adults spend almost a day virtually without moving, leading to obesity and a functional decline. These may be some reasons that make older adults decline in vigorous and moderate activities and spend more time in a lower intensity or sedentary state.

In Thailand, many studies have explored exercise and physical activity in older Thai adults. The results found that older Thai adults performed exercise and other forms of physical activity at low levels and did not meet the goal of the national health policy (2001) that aimed to promote people to perform 30 minutes moderate physical activity for 3-5 days per week. For example, the study of Asawachaisuwikrom (2001) found that 43% of 112 rural older adults participated in low to moderate intensity for regular physical activity. Most subjects reported doing light calisthenics such as standing with body movement (31%) and moving hands/ arms (22%). Others (57%) reported no regular physical activity and those somewhat active not meet the recommended level of regular physical activity.

Inpang (2000) reported that 200 older adults living in both urban and rural parts of Kamphaneg Phet province performed exercise at a low level. Also, Jitramontree

(2003) collected data from two known groups of older adults living in Bangkok who performed high exercise (N=75) and low exercise (N=75). The results showed that among low exercisers who currently did not exercise, 60% of participants reported that they never exercised. For those who previously exercised, most of them exercised everyday for 30 minutes by walking at home. Furthermore, Chinuntuya (2001) found that 59% of 300 older adults living in Bangkok did not engage in any exercise. Most of them performed lifestyle physical activity with light intensity such as light housework (74%), dish washing (63%), food preparation (53%), and moderate intensity activities such as shopping (63%), laundry (62%), leisure walking (48%), clearing walkways (31%), and childcare (29%).

In addition, Poolsawat (2007) found that among 315 older adults living in Bangkok who were 70 years and over performed light intensity and moderate physical activity including shopping (70.5%), doing light household work (62.5%), washing clothes (51.7%), and cooking (51.4%). Furthermore, they exercised by stretching (62.5%) and walking (40.6%). However, they performed these activities less than 30 minutes per day. In addition to leisure activities, older adults spent their time sleeping, watching television or listening to radio (90.8%), attending religious activities (80.3%), and talking with neighbor (69.5%). Furthermore, results from the National Statistical Office, Thailand (2007) survey found that only 41.4% of older adults exercised. Young older adults exercised more than middle adults and late older adults (46.8 %, 36 %, and 22.7 % respectively) (National Statistical Office, 2008).

These studies showed the same results that males performed exercise and occupation activity at higher rate than females while females performed more household activities than males (Asawachaisuwikrom, 2001; Inpang, 2000; Taweeluk, 1999). These may be due to the female's responsibility for family work more than males. Furthermore, males performed exercise and physical activity with a higher intensity, more frequently and of longer duration than females do. Several barriers were reported as obstacles to perform physical activity. Poor health or physical limitation was the most frequently noted barrier. The next most common barriers reported the family responsibility, no time, no friends or family support, bad weather, too few exercise facilities, cultural context related to exercise and physical activity and so on (Asawachaisuwikrom, 2001; Inpang, 2000; Jitramontree, 2003; Taweeluk, 1999).

While many studies examined exercise and the factors influencing this activity in older Thai adults, all of them were conducted in those who live in rural and urban areas. The results, therefore, cannot be generalized to those living in urban poor communities which have the uniqueness of environmental characteristics and social constructs that these environments may impede or facilitate physical activity performance. Results from Western countries show that older adults living in urban poor communities are more likely to be physically inactive or sedentary when compared to their counterparts (Kamphuis et al., 2007; Koster et al., 2006), consequently, it is important to examine whether older Thai adults living in urban poor communities are physically inactive or not and also what the predicting factors of physical activity are.

Physical Activity and Exercise

The terms “Physical activity” and “Exercise” are often used synonymously or interchangeably, but these two words have different meanings (Brach et al., 2004; United State Department of Health and Human Service (USDHHS), 1998). Physical activity refers to “any bodily movement that is produced by the contraction of skeletal muscle and substantially increases energy expenditure above the basal level” (Caspersen, Powell, & Christenson, 1985) comprising leisure time, occupational, household, and transportation activities whereas exercise is a subset of physical activity that is a structured and planned activity performed for fitness or health purpose (Dishman et al., 2004; USDHHS, 1999). Even though, both physical activity and exercise leads to physical fitness, exercise is performed for uplifting physical fitness proposes (Caspersen et al., 1985; USDHHS, 1998) and also often performed at a vigorous intensity (Bauman et al., 2006).

Physical activity can be classified in various ways. For example, it can be divided into two major types; lifestyle physical activity and leisure time physical activity (Pender et al, 1996). Lifestyle physical activity refers to self-selected activities which could be planned or unplanned activities that an individual performs at moderate to vigorous intensity at least 30 minutes accumulated per day. These activities include all leisure, occupational, and household activities (Dunn et al., 1998).

Leisure time physical activity refers to a structured, repetitive, and planned physical activity which focuses on intensity, duration, frequency, location and timetable (Pender, 1996). Individuals perform leisure time physical activity depending on personal interests and needs and also depending on the free time they have (Howley, 2001). These activities are composed of sports and formal conditioning exercises such as jogging, aerobic, swimming or other recreational activity (Pender, 1996). Although the intensity and duration of these activities vary by the type of activities, the common component of them resulted in substantial energy expenditure (Howley, 2001).

According to a compendium of physical activity, physical activity can be classified by the rate of energy expenditure into three levels; light, moderate, and vigorous intensity (Ainsworth et al., 2000). All activities from the compendium are assigned an intensity level based on the rate of energy expenditure expressed as Metabolic Equivalent Time (MET). MET is the unit of energy expenditure in terms of kilocalorie (kcal) per kilogram (kg) of body weight per hour. One MET refers to the energy cost of sitting quietly which is equal to a caloric consumption of 1kcal/kg/hour. Three and a half milliliters of oxygen uptake per kilogram of body weight per minute is equal to 1 MET (ACSM, 2006).

Intensity of activities in the Compendium is classified as multiples of 1 MET (Ainsworth et al., 2000). Light intensity physical activity means a person's caloric consumption that is less than 3 METs such as walking slowly, slow treading, very light effort, dusting or vacuuming. Moderate intensity means a person's caloric consumption is higher than three to six times (3-6 METs) of the energy cost of sitting quietly while vigorous intensity means the consumption is higher than six times (> 6 METs). The examples of moderate-intensity physical activity for older adults are brisk walking, climbing stairs, heavy housework (e.g. cleaning), and conditioning exercises such as general calisthenics while the examples of vigorous physical activity are running and vigorous calisthenics (USDHHS, 1999).

Physical Inactivity Consequences and Benefits of Physical Activity

Physical inactivity or sedentary lifestyles typically accompany aging (Vance et al., 2005), which is associated with a variety of adverse health conditions and problems. It plays a substantial part in the development of many chronic diseases,

such as, coronary heart disease, non-insulin dependent diabetes, ischemic heart disease, stroke, hypertension, depression, obesity, osteoporosis and some cancers, such as, colon cancer (Bennett et al., 2006; Booth, 2000; Bouchard & Rankinen, 2001; Kavanagh et al., 2005; Lim et al., 2007; Zhu & Chodzko-Zajko, 2003). Furthermore, its significant effect is a functional decline which is associated with falls, cognitive decline, functional dependency, hospitalization, disability, institutionalization, and even premature death (Buchman et al., 2007; Shephard, 2002; The Australian Health Ministers' Advisory Council [AHMAC] Care of Older Australian Working Group, 2004). This decline also affects the older adults' ability to perform routine activities and endanger autonomy (Vance et al., 2005).

Apart from the negative effects to individual health, physical inactivity has substantial economic consequences for the health care system as well (Booth, 2000). These consequences are associated with two types of costs: 1) the health care costs spending for preventative, diagnostic, and treatment services related to these chronic conditions; and 2) other costs associated with the future earnings lost by premature death (USDHHS, 2002). Therefore, physical inactivity should be considered equal to disease or pathology (Rikli, 2000) that needs to be urgently managed.

Empirical evidences have shown that exercise and other forms of physical activity are an important strategy to decrease morbidity, delay mortality (Friis et al., 2003; Henry et al., 2001; USDHHS, 1996), and prevent or delay further decline in mobility and functional status (Gretebeck et al., 2007). Furthermore, they can prevent or delay the development of many chronic diseases, such as, coronary heart disease, colon cancer, diabetes mellitus, hypertension (Nelson et. al., 2007), and osteoporosis (Bonaiuti et al., 2006; Kelley, 1998). In addition to physical health, exercise and other forms of physical activity can reduce symptoms of depression (Sjosten & Kivela, 2006), anxiety and stress (Dunn, Trivedi, & O'Neal, 2001; Starkweather, 2007). Also, they can improve quality of life and enhance psychological well being by providing older adults the opportunities for social interaction and support, increasing the older adults' feelings of self-mastery and self-efficacy, and relieving the older adults' daily stressors (Zhu & Chodzko-Zajko, 2003).

Measurement of Physical Activity in the Older Adults

Because physical activity is a complex behavior, appropriate measurement of physical activity is required. Physical activity is normally assessed by duration (e.g. total time per day or per time frame chosen), frequency (e.g. recently recall or longer term recall period), intensity (e.g. self perceived intensity or specific energy expenditures), type (e.g. kinds of physical activity), and settings (e.g. setting or location where the activity is performed) (Bauman et al., 2006). It can be measured by using subjective and objective measurements. Because each measurement has both advantages and disadvantages, the researchers need to be concerned about these issues before selecting measurements. In this chapter, the purpose is to focus on selecting a physical activity measurement for the older adults and to identify issues that may impact measurement selection.

Subjective Measurements

Subjective measures of physical activity most commonly used are questionnaires, interviews, physical activity diaries or physical activity logs, which individuals record information about all activities they performed (Bauman, et al., 2006; Shephard, 2002). Information from these measurements, such as; type, intensity, duration, and frequency are used to calculate the energy expenditure. A questionnaire is commonly used as a subjective measurement, which is designed to ask the participant to recall their physical activity in a particular time frame (24 hours, 7 days past, and one year). It is commonly used in larger-scale epidemiologic studies because of the advantages; such as, simple, reasonable cost, and convenient for the participant (Bauman, et al., 2006; Sallis & Saelens, 2000).

Subjective measurements, especially questionnaires, have disadvantages such as 1) recall bias or may over report socially desirable behaviors (e.g. exercise and diet) (Sallis & Saelens, 2000), and 2) daily and seasonal variability of physical activity patterns may contribute to measurement errors (Bauman, et al., 2006; Booth, 2000). Furthermore, using subjective measurements to measure physical activity, particularly, in the older adult may have some complications; such as, older adults may have difficulty with cognition and memory recall of lighter intensity activities that they perform more often than moderate and vigorous intensity activities (Sallis & Saelens, 2000; Washburn, 2000). Also, poor vision, hearing impairments

(Shephard, 2002), fluctuations in fatigue or mood, temperament distractions, and a lack of concentration (Rikli, 2000) are factors that compound difficulties of measurement.

Objective Measurements

Even though subjective measurements are commonly used to assess physical activity, they commonly contribute to measurement error as mentioned. Therefore, objective measurements have been used to validate subjective measurements. There are several objective measures; such as, motion sensors, heart rate monitoring, and the doubly labeled water method. Motion sensors are mechanical and electrical devices that measure motion or acceleration of limb or trunk depending on the attached position. There are many kinds of motion sensors ranging in complexity and cost from the pedometer to the triaxial accelerometer (Freedson & Miller, 2000).

The pedometer is used for assessing the amount of movement by counting steps. It responds by vertical acceleration and the major advantage of pedometer is that it is small and cheap. It has limited use for assessing the habitual activity for many reasons. The first reason is that it has a small memory to store data over a specific time interval. The second reason is that it is not susceptible to activity that involves the upper body or activity that does not involve locomotion and isometric exercise. The third reason is that it is not accurate at very slow or very fast walking speeds (Freedson & Miller, 2000). Furthermore, using a pedometer in older adults is problematic in those who have some types of gait abnormality, such as arthritis in one hip (Rikli, 2000). Even though, the pedometer may have many limitations, it is very useful in walking intervention when participants can self- monitor their behavior in order to determine whether they can attain the specific goals or not (Freedson & Miller, 2000).

The accelerometer is one kind of motor sensor that is more complex than pedometer. The accelerometer can measure physical activity in a single plane (uniaxial accelerometer) or in the vertical, horizontal and mediolateral plane (triaxial accelerometer). It can be attached to the trunk and/ or limbs. There are several advantages as they are not only small, having a large memory capacity to continuously record data over user-specified time intervals, but it also measures both the amount

and intensity of movement (Freedson & Miller, 2000). One disadvantage is that it is more expensive (US$350-500) and it often requires external hardware (i.e., computer interface equipment) and software.

Heart rate monitoring is another objective measure of physical activity which is based on the principle that heart rate and oxygen consumption (VO_2) for each person tend to be linearly related throughout the aerobic work range. The exercise heart rate can be used to estimate V02 and then compute the energy expenditure during free-living activities (Livingstone, 1997). Heart rate can only measure an individual's response to activity, and not measure the activity per se. It is not a good predictor of energy expenditure at low levels of activity. Many factors can influence heart rate including temperature, emotion, food intake, body position, and the muscle groups exercised. Furthermore, problems include allergic reactions to electrodes and the loss of contact from transmitter belts are further disadvantages (Livingstone, 1997). Heart rate monitoring is also less effective in older adults who are taking medication that affects cardiovascular function and those who have excessive adipose tissue that can make it difficult to correctly position the heart rate monitor (Freedson & Miller, 2000).

Doubly labeled water is a gold standard method that provides the most precise energy expenditure (Bellisle, 2001). It measures the total energy expenditure over several consecutive days under normal living conditions. The principle of this method is the total energy expenditure is measured from the turnover rate of two stable isotopes: hydrogen and oxygen. A subject's urine is collected then the subject first ingests water with isotopes of hydrogen and oxygen. After orally administering the first dose of isotopes, the subject's urine or saliva were collected daily for 7 days. The oxygen uptake and energy expenditure can be calculated from the difference in elimination of the hydrogen and oxygen (Bellisle, 2001). Even though doubly labeled water is a gold standard method, the disadvantages include 1) it is expensive and the total cost is depended on the subject's body mass; 2) it has technical difficulty in sample analysis (Westerterp, 1998); and 3) it can be used only on very limited samples (Bellisle, 2001). Furthermore, this method is also questionable for the older adult, especially those who are taking any kinds of medication that could affect water retention, circulatory system, and renal function (Rikli, 2000).

In sum, although objective measures can provide more precise estimates of energy expenditure, they also have disadvantages; such as, not being feasible for assessing physical activity in the large sample size because they are expensive and often complicated to use. Furthermore, they may alter natural behavior and make a burden on the subject. As objective measurements and subjective measurements have many pros and cons, the issues are 1) size and characteristic of the target population (e.g. age, cognitive ability), 2) practicality (e.g. time, cost, convenience), 3) acceptability to the subjects, and 4) accuracy (reliability and validity) (Bouchard & Shephard, 1994) which need to be of concern to the researchers.

In this study the subjective measurement which is the modified physical activity questionnaire for older Thai adults modified from the Self Report Physical Activity Questionnaire for Older Thai Adults (SPAQ) (Visuthipanich, 2009) was used. The reasons are 1) it was developed for older adults living in a community in Bangkok, Thailand; 2) it reflected all crucial information about physical activity in term of types, frequency, and duration; 3) it covers a range of activity in the daily life of the older adult; 4) it has acceptable psychometric properties, 5) it can be used in the large sample size because it is not complicated to use, and 6) it is not alter natural behavior and make a burden on the subject like objective measurement.

The Recommendation of Physical Activity for Older Adults

In the United States, to encourage the American people to increase their physical activity participation, the Center for Disease Control and Prevention (CDC) and the American College of Sports and Medicine (ACSM) issued a public health recommendation on the types and amounts of physical activity for healthy living. Earlier guidelines focused on physical fitness improvement by suggesting vigorous intensity response which is performed as a structured routine of at least 20 minutes per day on at least 3 days per week. The goal is to achieve a target heart rate of 60% to 90% maximum heart rate or 50% to 85% of maximal oxygen consumption (Burns, 1996). Unfortunately, the earlier guidelines deterred many persons adopting and maintaining exercise or physical activity.

The physical activity recommendation (1995) shifts from focusing only on exercise behavior or vigorous activity to the intermittent moderate physical activity

because the epidemiological evidence found that regular participation in moderate intensity can provide benefits to health similarly to those received from vigorous activity (Nelson et al., 2007). Moderate physical activity can include lifestyle physical activity comprising occupational, household, and recreational activity. Therefore, increasing physical activity should be conceded with both the role of moderate intensity leisure time and lifestyle approaches (Nelson et al., 2007). Recent, recommendations for the older adults physical activity is similar to the updated ACSM/American Heart Association (AHA) recommendation for adults, but it has several important improvements including: first, in order to promote and maintain health, older adults need to perform moderate-intensity aerobic physical activity for at least 30 minutes five days per week or vigorous intensity aerobic activity for at least 20 minutes on three days per week. Second, in order to achieve this recommendation, older adults can combine moderate and vigorous intensity activity together. This recommendation allows the older adults to perform short bouts of many kinds of physical activity to be included in the total daily activity. Third, older adults are recommended to perform activities that maintain or increase flexibility, while those who are at risk of falling are recommended to perform balance exercises (Nelson et al., 2007).

Urban Poor Communities

Definitions and the Nature of Urban Poor Communities

Before going into detail about the factors predicting physical activity in older Thai adults living in urban poor community, it is important to know the meaning and the nature of the urban poor community, especially in Bangkok, in order to fully understand the settings that might influence physical activity. There is no universal definition of what an “urban poor community” is but all previous researchers used this word interchangeably with an “urban slum”. In the general definition used by the United Nations (UN-HABITAT) slum refers to “a wide range of low-income settlements and/or poor human living conditions”. Slums can be characterized by using attributes (WHO, 2005) which are: 1) lack of basic services; 2) substandard housing or illegal and inadequate building structures; 3) overcrowding and high density; 4) unhealthy living

conditions and hazardous locations; 5) insecure tenure, irregular or informal settlements; 6) poverty and social exclusion; and 7) minimum settlement size.

Poor communities can be found in both urban and rural areas. Even though both of them are the most visible manifestation of poverty, these two poor communities are different. Because the challenges of urban poor communities, including high population density, overcrowding, intense living conditions (e.g. high competition, hastiness, high cost of living, high crime and violence), unsuitable living environments (e.g. intense traffic condition), and lack of social support, urban poverty is severe, pervasive and largely unrecognized (WHO, 2005). Therefore, vulnerabilities may be more prominent in urban poor communities than rural poor communities (WHO, 2008). According to the latest global report on human settlements, it was revealed that 43 % of the populations in developing countries live in urban poor communities, whereas 78% of urban residents in the least developed countries are urban poor dwellers. By the year 2030, the world's urban slum population is expected to grow to approximately two billion and increase to around three billion by 2050. This phenomenon poses critical situations to the health of the urban slum population in the world (WHO, 2005).

In this study, the word "urban poor communities" refers to the community where the density is equal to or more than 15 households per rai (1 rai =1,600 square meters) and the environmental conditions are polluted, dilapidated, and disorganized that it may affect the dwellers' health and safety (Bureau of Social Development, 2008). Furthermore the range of the study limits only on urban poor communities where 11% of dwellers are older adults.

Urban Poor Communities in Bangkok

Bangkok is the capital city and the largest urban area in Thailand known in Thai as "Krung Thep Maha Nakhon". Its area covers an area of 7,761.50 square kilometer (km^2) which is 1.51% of Thailand (513,000 km^2). The Ministry of Interior, Thailand reported that on December, 31, 2007 Bangkok had 5,716,248 registered residents including 2,727,574 males and 2,988,674 females and its population density was 3,644 per square kilometer (Wikipedia, 2008). It constitutes 11% of the total population in Thailand which was 63,038,247 people. Of this population, Bangkok is

comprised of 604,475 people aged 60 years and over, which, constitutes 10.6% of all aged groups (Department of Administration, Ministry of Interior, Thailand, 2008).

Bangkok has been the center of politic, social, culture, economic, technology, health care and tourism of not only Thailand, but also for South East Asia. Therefore, Bangkok is the best employment destination for most laborers and this has created an extremely large conglomeration of urban area. Because laborers cannot afford to live in a public housing, it is inevitable that these laborers and their families will live in poor communities (Duang Prateep Foundation, 2007). It has been estimated that about 676,832 people live in Bangkok's poor communities. Among these, around 71,401 are 60 years old and over (The Statistical Forecast Bureau, 2007).

Urban poor communities in Bangkok can be grouped into two types; registered and non-registered urban poor communities. The registered poor community means the community which has been officially recorded by the Bangkok Metropolitan Administration. The criterion for registration is that it does not belong to private owners. People residing in registered and non registered poor communities may have different living conditions. Registered poor community dwellers have official addresses which they can use to request for water and electricity services, health care services and other supports from the government, while those in non registered urban poor community cannot.

There are differences between the two types of communities; however, common physical characteristics of these communities include overcrowded, limited privacy, and substandard environments such as air pollution, no adequate drainage system and water supply, high crime and accidents, high temperature, highly dilapidated, low sanitation and so on. Generally, their housing is made from wood, concrete, or half of wood (45.4%, 28%, and 23.2 %, respectively), also it is estimated that 2.9 % is made from nonpermanent material (The Statistical Forecast Bureau, 2007). Their housing is in substandard housing conditions and lacks maintenance. In addition, a typical characteristic of urban poor communities are having ponds of slush water or "nam nao". These ponds are not only found in the rainy season, but also found in other seasons. The slush water can create both a bad smell, a source of vector-born disease and insects such as mosquito, and cockroach along with vermin. Furthermore, in some urban poor communities, houses are built along the train tracks;

dwellers will hear a loud noise from the trains which are passing every five minutes. Consequently, dwellers cannot escape from the noise pollution.

Impacts of Urban Poor Communities on Older Adults' Health

By natures of the urban poor community which are dynamic and complex, not only older adults struggle with disadvantaged environments previously mentioned, discrimination, both social and political create barriers to their health and increase vulnerability to this group as well. Therefore, urban poor older adults are more vulnerable to all crises compared to those who are urban non poor. Older adults will struggle for their survival especially when securing housing, foods, jobs, quality health care, safety and other amenities (Pornchokchai, 1992). Thus, older adults may encounter many burdens, not only to their physical health but their psychological and social health also.

Physical Health Burdens

Due to the nature of disadvantaged environment combined with the low level of education and low income of the residents results in low health literacy, communicable diseases (such as tuberculosis, HIV, diarrhea, sexually transmitted diseases), non communicable diseases (such as hypertension, diabetes mellitus, cancer, cardiovascular disease, chronic respiratory diseases), malnutrition, a low quality of life and premature death are the major health problems (Abercrombie et al., 2008; Fuller et al.,1993; Kittipimpanon, 2006; Piaseu & Mitchell, 2004; WHO, 2005, 2008). Furthermore, common physical hazards such as traffic accidents and accidental fires are additional physical health burdens.

Psychological and Social Health Burdens

Due to living in high ecological stress environments, urban poor older adults may experience more fluctuation than those living in the opposite. They may suffer from socio-economic and environmental stress and strain including unemployment, unsettlement, environmental deterioration, a limited privacy, family problems and violence, physical and sexual assault in the family among older adults and exposure to crime (Pornchokchai, 1992). The greater they encounter stress and strain, the more depressive and aggressive they become. Depression has become a common concern in urban poor older adults (Jitapunkul et al., 1993). Furthermore, compulsive

behaviors such as gambling and substance abuse (alcoholism and tobacco addiction) and Alzheimer disease are reported in urban poor older adults (WHO, 2005).

Even though residing in urban poor communities induces many negative consequences that may restrict dwellers ability to perform healthy behaviors and access to other facilities, living here can also create some positive effects. Urban poor dwellers formed their own groups or joined with other outside organizations such as the Duang Prateep Foundation and various academic institutes in order to solve the most basic problems. These grassroots groups formed by the urban poor are responding to the threat of physical deterioration and participating in solving many problems such as eviction, child abuse, drug addition, sanitation, garbage, poverty, unemployment and also health issues related to quality of life (Leaders and organizers of Community Organization in Asia, (LOCOA), 2007).

The Four Regions Slum Network is one example of an independent people's movement that was established with the goal of pushing forward the issues of housing rights, developing the quality of life of dwellers and seeking social justice (LOCOA, 2007). The Four Regions Slum Network established a coordination center for community health in order to receive complaints and follow up on the provision of medical care. Roles of these networks established both a good relationship among dwellers themselves and a good relationship between outsiders and dwellers. A sense of community and community empowerments has been developed.

Not only urban poor dwellers themselves help each other in order to increase their quality of life, the government established the basic policy of tackling the problems of poverty. The strategy of solving poverty problems and mitigating people's plight has four components including: 1) promotion of a holistic healthcare; 2) strategy of health security and providence; 3) strategy of creating healthcare-related careers; and 4) strategy of sustainable public health system (The Ministry of Public Health, 2007). According to one key domain of the 2nd National Plan for older persons (2001-2021) that is designed to alleviate the poverty of old age, the government has established various campaigns for the poor including providing 1) free bus and train transportation, 2) free water supply and electricity, 3) a universal coverage scheme with the aim to ensure equitable health care access, and 4) a monthly allowance of 500 Baht (14 US$) per person. Furthermore, Baan Mankong was established for the poor

with the aim to improve settlements and housing (Coronini- Cronberg, Laohasiriwong & Gericke, 2009).

Moreover, the Ministry of Public Health (MOPH) have also joined in the principal direction in helping people regarding public healthcare services such as providing health security, facilitating healthcare knowledge and inducing the involvement or people in developing their good health, and thus helping strengthen the quality of life. The MOPH has a policy to establish elderly clubs across the country in order to promote a healthy lifestyle for older people. They conduct various activities, such as exercises. In addition, the government has taken other initiatives, such as support to strengthen income security at old age, life-long education, day centers for health care, family assistance, counseling, social activities for the older adults, promotion of healthy behaviors from younger ages, and creating awareness among the community by organizing social activities for older persons (The Ministry of Public Health, 2007).

Factors Influencing Physical Activity in Older Thai Adults Living in Urban Poor Communities

While, there are multiple factors influencing physical activity in older adults, in this study the researcher focus only on the selected variables which correspond with the HPM, the SEM and empirical evidence in the phenomena and literature review.

Physical Activity Self-Efficacy

Based on Bandura's (1977, 1997) theory of self efficacy, self efficacy is defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments". Self-efficacy perception influences thoughts, emotional arousal, and actions of the individual. The greater the individuals perceive self efficacy for a behavior, the more vigorous and persistent they will engage in that behavior even though they face obstacles. Individuals will tend to avoid activities they believe surpass their abilities, and vice versa they will tend to perform activities they judge themselves capable for management (Bandura, 1977).

Self efficacy has been empirically supported as a predictor of health promoting behaviors (Bandura, 1997). It can influence health promoting behaviors by four principal sources of information: 1) enactive attainment which is the actual performance of a behavior; 2) vicarious experiences which is observing the performances of others; 3) verbal persuasion; and 4) physiological states or physiological feedback during performing a behavior (Bandura, 1986).

Enactive attainment is the most pivotal source of self efficacy because it is based on actual experience. Although performance is the most important source of self efficacy, performance alone does not establish the self efficacy belief. There are many factors that influence the individual's cognitive appraisal about self efficacy; such as, preconceptions of ability, the perception of the task's difficulty, the amount of effort, the external aid from others, the situational circumstance and past successes and failures (Bandura, 1986). The second source of self efficacy information is vicarious experience or seeing similar people who successfully perform the same thing. Individuals will convince themselves that they should be able to achieve if others can or at least they should have some progress in their performance. Vice versa, observing the failure of others who they perceived to be of similar competence despite many attempts, individuals will have a lower judgment about their own capabilities and underestimate their effort (Bandura, 1986; Resnick, 2003).

The third source of self efficacy information is verbal persuasion. It involves talking with others that they have the ability to execute the given behavior. Individuals, who are persuaded that they can master the given behavior, tend to mobilize a higher sustained effort than when they have self doubt about their competence when faced with difficulty. The last source of self efficacy information is the physiological state. Individuals tend to judge their ability following information about their physiological state. Individuals may avoid performing the behavior if they assess their physiological state as a reaction to arousal or aversive (Bandura, 1986; Resnick, 2003).

The relationship between Physical Activity Self-Efficacy and Physical Activity

Physical activity is an integrated part of daily activities, including leisure time, occupational, household, and transportation activity. Some simple activities such as walking, stair climbing, and carrying things are example of

daily activities that young people can easily perform; however, these activities for older adults may become difficult and challenging (Graves, Pollock, & Carroll, 1994). Thus, older adults may need more physical activity self-efficacy than younger adults. The reasons why older adults may need more physical activity self-efficacy might be advanced age is associated with a reduction in muscle mass and muscular strength (Graves et al., 1994), also, a decrease in control beliefs regarding mobility and functional performance (Bandura, 2001). For these reasons, older adults might have a low self efficacy regarding their ability to engage in exercise and physical activity performance (Conn et al., 2003; Focht et al., 2007).

Self efficacy is a crucial determinant to the older adults' physical activity because the ability to engage in physical activity in older adult is influenced by their confidence or belief in their own abilities. Older adults need to believe in their own abilities that they can perform exercise and physical activity as a regular habit if they want to change their sedentary lifestyle to physically active (Bandura, 1997). Therefore, physical activity self-efficacy has been operationalized as efficacy to overcome physical activity barriers. Numerous research studies have found physical activity self-efficacy as the best predictor and most consistent association for physical activity in older adults.

For example, Brassington and others (2002) examined mediators of exercise-counseling intervention on exercise adherence by comparing the abilities of self-efficacy and outcome expectancies versus social support in 103 community-dwellers older adults who received the course of a 12- month telephone-based exercise counseling program. The results showed that changes in self-efficacy and outcome expectation were associated with a 7- to 12-month exercise adherence ($r = .46$, $p < .01$), while exercise-related social support was not associated with adherence.

Duncan and Mummery (2005) examined psychosocial and environmental factors associated with physical activity among 1,281 city dwellers in regional Queensland of which 55.8% were older adults. The results showed the odds ratios in the prediction of sufficient levels of physical activity when people reported high levels of self-efficacy and social support they were more likely to attain sufficient levels of activity in the previous week compared to people reporting low levels of these correlates.

Furthermore, McAuley and others (2003) examined the predictive factors of long-term exercise behavior of 174 older adults in the context of a 6-month randomized controlled trial with an 18-month follow-up. The results showed that self efficacy was related to physical activity at 6 and 18 month follow-up ($r= .27$, $p<.05$, $r=.52$, $p<.05$, respectively). This cohort study provides support for including self efficacy in models of exercise adherence and underscores the important role of self-efficacy in long-term exercise behavior. In addition, Resnick and others (2000) tested a model describing the factors that influence the exercise behavior of 187 older adults living in a continuing care retirement community in the USA. The results revealed that exercise has a reciprocal relationship with self efficacy expectations and mental and physical health. There was a statistically significant difference in self-efficacy expectations ($F= .88$, $p < .05$) or self efficacy was related to physical activity ($r =.56$, $p<.05$). Umstattd and Hallam (2007) examined whether three variables from social cognitive theory, which are, self-efficacy, self-regulation, and outcome-expectancy value can predict 98 older adults' exercise behavior. The results found that all three variables had a significantly direct effect on exercise behavior; self efficacy had high relationship with exercise behavior ($r=.81$, $p<.01$).

In Thailand, Chinuntuya (2001) conducted a causal model to explain exercise behaviors including leisure time and life style exercise behavior for 300 older Thai adults living in Bangkok. The results found that perceived self efficacy for exercise had a significantly direct effect on exercise behavior in the leisure time exercise model ($\beta= .36$, $p<.05$). Furthermore, Jitramontree (2003) conducted a descriptive prospective correlation design about predicting exercise behavior among older Thai adults. The samples were two known groups of older adults: high exercise (N=75) and low exercise (N= 75). Results found that self efficacy was significantly correlated with exercise behavior ($r= .51$, $p <.01$). In addition, Poolsawat (2007) determined predicting factors of physical activity in 315 older adults who were 70 years and over living in Bangkok. The results showed that self efficacy is one factor that has a statistically significant correlation to physical activity ($r= .55$, $p<.001$). Older adult who perceived higher self efficacy reported a higher physical activity score.

Although self efficacy was consistently found to predict the older adults' physical activity in most studies, a few studies did not support the

relationship or showed a low relationship between these two variables. For example, the study of Anderson and others (2006) tested a social– cognitive model of physical activity by using data from 999 adult participants ranging in age from 18 to 92 years (M = 52.73, SD = 14.56). Within the model, self-regulation exerted the strongest effect on physical activity but self-efficacy had little effect on physical activity (r= .12). Furthermore, Resnick (2001) tested a model of overall activity in 175 older adults living in a continuing care retirement community. The results found that self efficacy directly influenced physical activity in a low level (r=.23, p<.05).

In addition, in Thailand, Asawachaisuwikrom (2001) conducted predictors of physical activity among 112 older Thai adults living in Chonburi province. The results showed self efficacy had a low relationship with physical activity (r= .32, p<.01). Another study is Taweeluk (1999)'s study which investigated predictors of exercise activity among 328 rural Thai older adults living in Chiang Mai province. The result revealed that only gender and perceived benefit of exercise were found to be significant predictors but self efficacy did not (r =.19, p<.001).

Due to the inconsistent results from prior studies, physical activity self-efficacy is included in this model as a core determinant of physical activity. Furthermore the relationships among selected variables are explored.

Perceived Physical Health

Health means not only the absence of disease or injury but also physical, mental and social well being (Statistics Canada, 2009). Perceived health is an indicator of overall health status. It is defined as the perception of a person's health in general, either by the person himself or herself, or, by the person responding (Statistics Canada, 2009). Pender (1996) defined perceived physical health as one component of perceived health status which is a personal psychological factor. It contributes significantly to an individual's views of self and self evaluation about their health. Individuals establish a standard for themselves and use these standards in the self evaluative cognition process (Bandura, 1986).

Perceived physical health can reflect the individuals' perception about the transitional status of acute symptoms, chronic illness, disability, functional limitation and physical well being. Perceived physical health acts as motivational sources for

performing actions and is used to reinforce the value of good health by promoting individuals to be interested and to perform healthy behavior in cases who perceived themselves healthy. In turn, they may act as a threat, induce an individual fear and avoidance and also decrease their capacity to engage in healthy behavior in cases who perceive a poor health status (Pender, 1987). Individuals perceived health differently depending on several factors such as socio-demographic and socio-medical factors (Jarallah & Al-Shammari, 1999) which are: gender, income, employment or unemployment, social support, health risk behaviors and so on (Kanjanapan, 2008).

The study revealed that a poor health perception was found predominantly in advanced age (75 years and more), especially in females and was associated with the higher social and economical under privileged. Not only do these variables affect the poor health perception, significant determinants of poor health perception are the number of diagnoses and hospital visits (Jarallah & Al-Shammari, 1999). Even though the number of diagnoses and hospital visits are associated with a health perception, individuals who are diagnosed with a chronic illness or living with a disability may be perceived healthy. The reason may be chronic illness is not only determinant factor for establishing the older adults' state of health or well being (Pender, 1987). One of the important factors in establishing well being is adaptation. To achieve maximization of health satisfaction, adaptation of lifestyle is necessary (Ebersole et al., 2005). Individuals who live in urban poor communities, they might be perceived in poor health more than less poor counterparts because these groups might suffer from economic disadvantages, less education, less access to quality healthcare services, higher perform risk behaviors that lead to worse in health, increase incidence of chronic diseases and co morbidities (Mahasneh, 2001).

The Relationship between Perceived Physical Health and Physical Activity

Perceived physical health is an important determinant of many health behaviors, including exercise and physical activity performance. It may influence the individuals' estimated physical capacity or physical activity self efficacy, then, the individual desire to perform exercise and physical activity or limit the self-direction of exercise and physical activity performance (Conn et al., 2003; Resnick, 2001). Many studies found a relationship between perceived health status and physical activity,

which, perceived poor health status is a negative determinant of physical activity, especially in older adults.

For example, the results from the study of Booth, Bauman and Owen (2002) found that the most frequent cited barriers to regular participation in exercise behavior among the youngest age group were: insufficient time, lack of motivation and child care responsibilities, whereas, among people aged 60 to 78 years, poor health was the most frequent cited barrier to activity. Furthermore, Dawson and others (2007) investigated whether low levels of walking among 680 older adults age 50 years and over (mean age 64.4 year) in the UK were associated with demographic, health characteristics, and perceived environmental attributes. The results showed that perceived health status has a significant adverse relationship with overall physical activity levels ($Z = –2.72$, $p = .006$). Also, among older people who like walking, health problems might more seriously affect overall physical activity levels than perceived environmental barriers ($Z = –2.35$, $p = .019$).

Dunn (2008) conducted a study to determine how to maximize the adherence to a walking intervention program in 14 older African American women. The results revealed that perceived health status is one of the factors influencing adherence to physical activity in this group. Furthermore, Gee (2005) examined the relationship among lifestyle physical activity, self efficacy, perceived health status including perceived physical health and perceived mental health and social support in a sample of 99 rural hypertensive older adults residing in free standing homes. The results found that perceived physical health was found to directly influence lifestyle physical activity ($r=.38$, $p<.05$). Greater perceived good health was significantly associated with lifestyle physical activity.

In addition, Lee and Laffrey (2006) tested a predictive model of physical activity in older adults with borderline hypertension in a sample of 267 men and women aged 60-75 years. The results found that gender, income, previous exercise experience, self efficacy, and motivation for physical activity directly predicted physical activity while perceived health status, barriers to physical activity, self efficacy, and environmental influence indirectly predicted physical activity. These results are congruent with the study of Plonczynski and others (2008) that found physical health explained a significant portion of older adults' leisure time exercise.

Also, the study of Rosqvist and others (2008) found that one of the perceived barriers to physical activity in older adults is poor health status.

Although most studies support the relationship between perceived health status and physical activity, some studies, such as the study of Wilbur and others (2003) did not support the relationship between physical activity and perceived health status among 300 volunteer Latinas aged 20 to 50 years, living in Chicago. Also, the study of Wilcox and others (2003) found no relationship between these two variables among 102 rural older women.

The Relationship between Perceived Physical Health, Physical Activity Self-Efficacy and Physical Activity

Perceived physical health can influence the older adults' self efficacy expectation. Resnick and others (2000) and Resnick (2001) found that perceived physical health was significantly associated with self efficacy expectation ($r=.34$, $p<.05$, $r=.53$, $p<.05$ respectively). Also, perceived physical health was indirectly associated with current exercise through self efficacy and/ or outcome expectations (Resnick, 2001). Lower perception of one's health status has been associated with less exercise behavior and less overall activity in older adults (Gee, 2005). Even though perceived physical health is one component of perceived health status used as a proxy for physical health measurement and has been shown to be remarkably predictive for exercise and physical activity, the study of Resnick and others (2000) reported no relationship between perceived health status and physical activity among 187 older adults living in a continuing care retirement community. The reason might be the sample perceived themselves healthy. Also, the result showed a small significant relationship between perceived health status and physical activity ($r=.22$, $p<.05$) in a sample of 175 older adults living in a continuing-care retirement community (Resnick, 2001).

Based on prior inconsistent research findings, perceived physical health need to be studied in the context of those who live in urban poor communities in order to know how they perceive their physical health and whether perceived physical health can predict physical activity or not. In this study perceived physical health is thought to directly influence self efficacy and physical activity and indirectly influence physical activity through self efficacy.

Perceived Mental Health

The World Health Organization defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2007). Perceived mental health is a subjective measure of overall mental health status. It can reflect the individual's perception about mental health well being, mental disorder, mental or emotional problems or distress (Statistics Canada, 2009). Even though perceived mental health may not directly correspond with mental disorders diagnosis, perceptions are important in individuals own right and may affect their mental health service use (Statistics Canada, 2009).

Like perceived physical health, perceived mental health can act as motivational sources for performing actions and is used to reinforce the value of good health by promoting individuals to be interested and to perform healthy behavior in cases who perceived themselves healthy (Pender, 1987). Even though the mental health problems that can be found in older adults are anxiety and stress, the main mental health problem in older adults is depression. Older adults living in poor communities are more vulnerable to depression than those who have the opposite (Jain & Aras, 2007) because they struggle with poverty that may be linked to a poorer level of physical function, disability, as well as chronic diseases (Abercrombie et al., 2008), which are associated with poor mental health and low quality of life (Smyer, 1993). Since depression is one of the most important mental disorders that found in poor older people also one-third of poor older Thai adults been treated for depression (Jitapunkul et al., 1993); therefore, in this study perceived mental health is defined as a self evaluation of the mental health problem. It was measured by the Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population (Kasantikul et al., 1997).

The Relationship between Perceived Mental Health and Physical activity

Previous studies indicated that mental health and mood, especially depression, influence exercise and physical activity. Individuals who perceived themselves depression will be sedentary more than those who have no depressive symptoms (Clark et al., 1995; Coday et al, 2002; Dunn, Trivedi & O'Neal,

2001; Wilcox et al., 2003; Wilcox & King, 2004). Depression may affect physical activity in many ways. One way may be the persistent somatic symptoms of depression, such as, feeling fatigued or a low level of energy, also, the markedly diminished interest or pleasure in all, or almost all activities may affect physical activity levels over time (American Psychiatric Association, 2000). Depression will affect persons not only by avoidance of social interaction, but also by being inactive in activities daily living (ADLs), or instrumental activities daily living (IADLs), and other activities including exercise behavior and hobbies (Kivela, 2001).

Many studies supported the relationship between depression and physical inactivity. For example, Cohen-Mansfield and others (2003) found that depression is one of perceived barriers to exercise in 324 community dwellers, age 74–85 years. The results also revealed that depression was related to less exercise activity and poorer health ($r=.45$, $p<.001$). Craft and others (2008) assessed the psychosocial determinants of exercise in a sample of 61 women with depressive symptoms. The results showed that these participants reported minimal exercise involvement, numerous barriers to exercise, low levels of self-efficacy, and low social support for exercise. These results are consistent with the study Wilcox and others (2003) found that depressive symptoms were negatively associated with physical activity among 102 rural older adults (41% African American).

The Relationship among Perceived Mental Health, Physical Activity Self-Efficacy and Physical Activity

Based on self-efficacy theory (Bandura, 1986), emotional arousal is thought to have a particular impact on the cognitive appraisal process, and thus efficacy expectations and behavior. It is another source of information that can affect perceived self-efficacy by coping with threatening situations. Because high arousal usually debilitates performance; therefore, people are more likely to expect success when they are not surrounded by aversive arousal. In the opposing way, if people are tense and excited they are prone to expect failure when they are surrounded by aversive arousal.

The study found that mood disturbance will have an inverse relationship both concurrently and predicatively with efficacy expectations for engaging in health behaviors (Perkins & Jenkins, 1998). Low mood disturbance is

linked to stronger self-efficacy beliefs and better behavioral performance (Gecht et al., 1996, Kurlowicz, 1998, Perkins & Jenkins, 1998). Also, positive mood contribute to a higher sense of self efficacy because individuals are more prone to recall and focus on past successful experiences. Vice versa, negative mood such as, depression, stress and anxiety contribute to a poorer sense of self efficacy because individuals tend to recall and focus on past failure. Among patients with depression compared to those with other mental disorders, this depression group has lower self efficacy than other groups (β=.76, p=.011) (Ussher et al., 2007). In addition, the natures of depression which are the feelings of helplessness, hopelessness and worthlessness will destroy energy, self esteem and self efficacy (Lucidi et al., 2006). Therefore, the person who perceived poor mental health may have low level of self efficacy.

Self efficacy mediates the effect of perceived mental health in some studies; however, there has been no empirical examination of association among perceived mental health, self efficacy and physical activity in older Thai adults as to whether perceived mental health affects to the older adults' self efficacy and then physical activity or not. Therefore, these relationships need to be studied.

Social Support

Social support is one component of an interpersonal influence, a cognition focused on the behaviors, beliefs or attitudes of other individuals. Social support is defined when a person feels belonging, is accepted and loved, and feels a sense of worth (Pender, 1996). Furthermore, it can be defined as a society stretch that could be used to support a person's ability to acquire health behavior, cope and a response to stress (Thoits, 1995). Social support may consist of 1) the instrument support which is the assistance of manpower, equipment, money, and so on; 2) information support which provides the assistance and guidance for the individual to cope with the problem; 3) emotional support which promotes individual's worth by providing loving, caring, acceptance, value and social integration; and 4) appraisal support which provides information that is useful for self evaluation rather than problem solving (Langford et al., 1997). Social support can be provided by family, friends, coworkers, health care professionals and so on. Different sources of support are possible to provide differing amounts and types of supports (Heaney & Israel, 2002).

Social support has been reported as an important variable that influences health and health behaviors (Adam et al., 2000; Heaney & Israel, 2002). It influences health and health behaviors through the main effect (direct effect) and the buffering effect (indirect effect). The main effect implies that social support has a positive effect on health, irrespective of life situation. The buffering effect will happen when persons exposed to stressors and cannot cope with them. In this case, social support is supposed to help the person cope better with the stressful situation. Perceived helpful social support can decrease negative feelings and enhance a person's self confidence (Heaney & Israel, 2002). Not only social support can buffer the negative effects of stressful life events, but also can provide feedback or confirmation of action and create a growth promoting environment (Adam et al., 2000). An absence of social support may increase the incidence of illness (Pender, 1996).

The Relationship between Social Support and Physical Activity

Social support for physical activity refers to how often the individual received assistance for physical activity from their social network such as family, friends, health care providers, such as physician, nurses, or an exercise trainer and so on (Resnick et al., 2002). Social support is often noted as an important predictor of older adults' exercise or physical activity (McAuley et al., 2003; Park, Housemann, & Brownson, 2003). Social supports for exercise or physical activity may include, instrumental support such as giving them equipment, money, and accompany them to exercise; emotional support such as providing encouragement and reinforcement, seeing or asking them about their progress or any problems when they perform physical activity; and information support such as sharing information about exercise or benefits of exercise and physical activity (Resnick et al., 2002).

Duncan and Mummery (2005) found that people reporting high level of social support were more likely to participate in recreational walking than those reporting low level of social support. Furthermore, McAuley and others (2003) found that social network and support that are created within the exercise group are often considered important correlates of an older adults' exercise behavior. These studies are consistent with the study of Plonczynski and others (2008) that examined factors influencing the lifestyle physical activity of 176 older rural women residing in

their own home located in one northern, rural country of Illinois. The results found that social support explained a significant portion of women older adults' household physical activity. Another study is Resnick and others (2002) found a statistically significant difference in friend social support scores between older adults who exercised regularly and those who did not.

In Thailand, Asawachaisuwikrom (2001) found that social support has a relationship with physical activity in older adults ($r=.40$, $p<.05$). Furthermore Chinuntuya (2001) found the same result that social support was a significant predictor of leisure time exercise ($r=.45$, $p<.05$) and lifestyle exercise ($r=.21$, $p<.05$) in a sample of 300 older Thai adults living in Bangkok.

The Relationship among Social Support, Physical Activity Self-Efficacy and Physical Activity

Anderson and others (2006) found that social support from family members had an indirect effect on physical activity (β indirect = .20) through self efficacy (β total = .35). McAuley and others (2003) and Youngpradith (2005) found the same results that social support affected physical activity through the mediation of self-efficacy. Resnick and others (2002) found that social support from friends had a direct statistically significant influence on self-efficacy expectations related to exercise ($r= .22$, $p < .05$). Social support from friends had indirectly influence exercise behavior through self efficacy. Social support can enhance self efficacy by strengthening the perceptions of physical activity capabilities.

Even though most research studies supported the relationship among these variables, social support in the socio economical disadvantaged group may different owing to different contexts. Therefore in this study, social support was included in the model.

A Sense of Community

According to the SEM, a sense of community is an aspect of the social cultural environment, which is a phrase commonly used by dwellers, politicians, and social scientists, to characterize the relationship between the person and the social structure (Chavis & Wanderman, 1990). It is defined as the feeling of commitment and obligation that an individual feels toward community members; feelings of being part of

the community; and having a mutual understanding of collective values, beliefs, and interests among community members (Chaskin et al., 2001; McMillan & Chavis, 1986). It is composed of four components: 1) membership, 2) influence, 3) integration and fulfillment of needs, and 4) shared emotional connection (McMillan & Chavis, 1986).

Membership refers to a feeling of belonging and being a part of a group. Membership has boundaries which provide members with emotional safety and intimacy. Boundaries can be developed by using the same language, dress, and performing the same customs. The second component is influence that is a two directional concept which one is a member attracted to a group and another one is a group capability to influence its members. Members are more attracted to a community that they are influential. The third component is integration and fulfillment of needs or reinforcement. It refers to a behavioral motivator, which is, rewarded for its members. It is the primary function of a strong-bond community. Individuals seem to be attracted to people and groups that offer the most rewards or positive reinforcements. The fourth component is a shared emotional connection. It refers to the interaction of members in shared events and the specific attribute of events. The more people interact, the more likely they become close. Also, the more positive the experience and the relationship, the stronger and greater the bond (McMillan & Chavis, 1986).

When a sense of community is developed, dwellers are more prone to interact with each other. In turn, these interactions continue to enhance the emotional connection which helps dwellers maintain a sense of community (McMillan & Chavis, 1986). A sense of community is important to individuals in all cultures and across the human life span, particularly older adults (Byoung-Suk, Sullivan, & Wiley, 1998). It has a relationship with well-being (Pretty et al., 1996), longevity (Byoung-Suk, Sullivan & Wiley, 1998), life satisfaction (Department of Environment Food and Rural Affair, 2007; Prezza & Osrantin, 1998), being a volunteer (Okun & Michel, 2006), being in better physical and mental health, experienced lower stress, and also being more physically active (Young, Russell, & Powers, 2004).

Even if a sense of community is clearly important for older adults, many older adults who live in some areas, such as, urban poor communities may restrict a sense of community development. The reasons might be due to living in high

ecological stress environments, urban poor older adults might limit the interaction with each other. However, the perception of environmental problems may serve as a motivator to action. For example, in urban poor areas, most dwellers developed some self help and formed community organizations as a resource to respond to physical deterioration (Chavis & Wandersman, 1990). Hence, living in these areas can be a special challenge for older adults to develop or maintain a sense of community (Byoung-Suk, Sullivan & Wiley, 1998).

The Relationship between a Sense of Community and Physical Activity

A sense of community can influence physical activity by working as a motivational source for action. When people have a sense of community, they are more likely to interact with the residents in their communities. In Western countries, many studies explored the relationship between physical activity and a sense of community. The findings regarding these relationships are inconsistent. Some studies found the relationship between a sense of community and physical activity while some did not. For example, Fallen and others (2005) found the relationship between a better sense of community and being physically active in community residents in those age 18-60 years. This result is consistent with the study of Young and others (2004) that found the relationship between a better sense of community and being physically active in 9,945 women aged 73-78 years. Higher scores (stronger sense of community) were associated with being active.

Contrary to the previous results, Ainsworth and others (2003) found a sense of community was not associated with physical activity among 917 African-American women aged 20 to 50 years living in two counties in South Carolina. The results also revealed that a sense of community was not associated with physical activity among 671 Latina immigrants, aged 20 to 50 years living in North Carolina (Evenson et al., 2003), among 1,000 rural white women aged 20 to 50 years (Eyler, 2003), among 350 Native American women aged 20-50 years from the Southwest (Thomson et al., 2003), among 285 Hispanic/Latino women aged 20-50 years (Voorhees & Young, 2003), and among 300 volunteer Latinas, aged 20 to 50 years, living in Chicago (Wilbur et al., 2003).

Due to the inconsistent results also a lack of a sense of community study in older Thai adults; therefore, it is especially important to investigate this construct in older adults who live in urban poor communities to determine whether a sense of community can predict physical activity. A sense of community is also proposed as one mediator for physical activity in this study.

The Relationship between a Sense of Community and Neighborhood Environment and Facilities

The SEM not only proposed the assumption that behavior is influenced by the interactions between individuals and their physical and social environment but it also proposed the interaction within and across differing levels of environment and gatherings of people. From the literature review, the results support the relationship between physical environments and social environments. The studies found that the neighborhood environment and facilities can influence a sense of community by supporting the willingness of older adults to participate with each other.

Older adults who feel safe in their communities and have a perceived environment satisfaction will use settings such as lounges, parks, spaces in front of their buildings as places to sit and talk with their neighbors and possibly develop further supportive relationships, have more encouragement to participate which leads to a greater sense of community (Byoung-Suk, Sullivan & Wiley, 1998; Chavis, & Wandersman, 1990). The perception of environment involves individual judgments, not only perceived environment qualities and satisfactions, but also perceived environment problems. If environment is viewed as negative, it can lead to stress (Chavis & Wandersman, 1990). Negative signs of environment, especially unhealthy and unsafe environments, such as, noisy, dilapidated, litter, crowded environment, and high crimes may restrict older adults to develop a sense of community. These environments may impede their neighborhood interactions (Krause, 1996) and relate to the older adults' withdrawal from the neighborhood (Byoung-Suk, Sullivan & Wiley, 1998; Chavis & Wandersman, 1990; Krause, 1996).

The Relationship among a Sense of Community, Social Support, Physical Activity Self-Efficacy and Physical Activity

For the relationship between a sense of community and physical activity self-efficacy, having a sense of community cohesion has been found

to partially alleviate fears about neighborhood crime and safety that may influence the individuals' physical activity self efficacy. Furthermore, Okun and Michel (2006) revealed that a sense of community predicted being a volunteer in older adults who live in poor communities, because of their attachment to their communities. Older adults who are volunteers involved in the organization's everyday activities will receive the most benefits, including an increased self-efficacy.

In addition, it is unclear whether a sense of community correlates to social support but in schools, family support is strongly related to a sense of community (Vieno et al., 2007; Wentzel, 1998). A sense of community may be strengthened by actual experiences of social support, but it is not dependent upon it (Pretty et al., 1996). The relationships among a sense of community, social support, self efficacy and physical activity are also unclear. Wentzel (1998) and Vieno and others (2007) found a relationship among social support, a sense of community and self efficacy in schools; a school sense of community is significantly related to self efficacy, while family support is strongly related to a sense of community in schools. Even though the studies support the relationships among these variables, the relationships among a sense of community, social support, self efficacy and physical activity have not been examined in the older adult group.

In Thailand, even though, traditional Thai culture provides a strong normative basis for the support and respect for older people (Hengudomsub, 2005), the difference in the characteristics of social structure and environment in urban poor communities may affect the level of social support and a sense of community. It is unclear about the relationships among a sense of community and other variables. Furthermore, lack of study about a sense of community and the extent that a sense of community influences physical activity exists; therefore, it is important to examine a sense of community on physical activity and the relationships among these variables. In this study, it will be hypothesized that a sense of community will have a positive significant direct effect and a positive significant indirect effect to physical activity through physical activity self-efficacy.

Neighborhood Environment and Facilities

According to the HPM, situational influences which are one component in behavior-specific cognitions and affect are defined as personal perceptions and evaluations of any situation or environment that can facilitate and/or impede health promoting behavior. Since situation influences include options available, demand characteristics and aesthetic features of environment, that health promoting behavior is proposed to take place, neighborhood environment and facilities therefore can be conceptualized in this component. According to the SEM, the environment can: 1) operate as a stressor, exerting detrimental effects on people's mood, performance, and physiology; 2) can function as a source of safety or danger; 3) can serve as an enabler of health behavior; and 4) can serve as a provider of health resources (Stokols, 1996). Individuals tend to perform healthy behaviors in situations or environments that they feel connected rather than alienated, harmonious rather than inharmonious, facilitate rather than non facilitate, also safe and reassured rather than unsafe and threatened (Pender et al., 2002).

The Relationship between Neighborhood Environment and Facilities and Physical Activity

Recently, physical environments which are neighborhood environment and facilities have received more attention from many researchers and been identified as important determinants of exercise and physical activity (Duncan & Mummery, 2005; King et al., 2002**;** Wilcox et al, 2000; Wilcox et al., 2003). For example, Booth and others (2000) and Giles-Corti and Donovan (2002) revealed that older adults who had their house located near recreational facilities reported increased walking and using these facilities more than others who had the opposite conditions. Another study revealed that the presence of hills, biking and walking trails, street lights and various recreation facilities were related to a higher physical activity score among 764 older adults (Chad et al., 2005). Furthermore, Foster, Hillsdon, and Thorogood (2004) revealed that among 4,265 women aged 16–74 years, perceived safety of walking during the day was associated with any reported walking occasions while perceptions of the environment were not related to women walking equal to or more than 150 min/week. In men, having a park within walking distance was associated with walking equal to or more than 150 min/week, but their walking was

not influenced by concerns about safety. In addition, van Lenthe, Brug, and Mackenbach (2005) compared physical activity among 8,767 residents aged 20-69 years who lived in the most advantaged neighborhoods with those who live in the most disadvantaged neighborhoods. The results showed that those living in the most disadvantaged neighborhood were less likely to walk, cycle or garden in leisure time and less likely to participate in sports activities.

Despite most studies finding a relationship between neighborhood environments and facilities and physical activity, some findings do not support this relationship. For example, the study of Evenson and others (2003) showed that detrimental neighborhood environments, such as: traffic, street lighting, unattended dogs, safety, and places within walking distance were not strong predictors of physical activity among Latina immigrants women aged 20 to 50 years. Furthermore, Wilcox and others (2003) found that perceived sidewalks and perceived traffic were negatively associated with physical activity among 102 African American and rural older women (70.6 ± 9.2 years). Also, the study of Sanderson and team (2003) and the study of Young and Voorhee (2003) found no association between neighborhood environment and facilities with physical activity level among African-American women aged 20-50 years. Another study revealed that the indicators of availability of sports facilities, which were the number of swimming pools and the number of gyms per 10,000 population was not related with either swimming or gym use in either sex, or with gym use in men (Pascual et al., 2008).

In Thailand, while Asawachaisuwikrom (2001) found a relationship between neighborhood environment ($r = .46$, $p < .01$), convenient facilities ($r = .58$, $p < .01$) and physical activity of older adults living in rural areas, this result cannot be generalized to older adults living in urban poor communities. Due to the limited number of previous studies addressing perceptions of low income neighborhood and household resources in relationship to older Thai adult physical activity and the inconsistency of the results, these variables were selected in this study. It is hypothesized that older adults who perceive a better neighborhood environment and facilities are more likely to participate in physical activity than those who do not.

The Relationships among Neighborhood Environment and Facilities, Physical Activity Self-Efficacy and Physical activity

The perceptions of environment may act as a source of self-efficacy information that can present a facilitative or a restrictive environment which influences efficacy expectations that in turn drive behavior (Bandura, 2001). Evidence from some studies found that older adults who reported greater neighborhood satisfaction had higher levels of efficacy to overcome barriers to exercise (Booth et al, 2000). Furthermore, studies found that neighborhood environment and availability of facilities have a direct and indirect effect on physical activity through self efficacy (McAuley et al., 2003; McNeill et al., 2006).

In some studies, the relationship between neighborhood satisfaction and self-efficacy was non-significant. Furthermore, the indirect effects of neighborhood satisfaction on physical activity were relatively small (Morris, McAuley & Motl, 2008; Motl et al., 2005; Prodaniuk et al., 2004). Due to these inconsistent results, in this study, the researcher examine the direct and indirect effect of neighborhood environment and facilities on the physical activity of older adults living in urban poor communities in order to increase the understanding of how older adults perceive their physical environment and to evaluate environmental support for physical activity.

Conclusion

From review literature about physical activity, the results found that some older adults in many countries, including Thailand, performed low levels of physical activity that was inadequate to promote or maintain their health. Many researchers have made many attempts to increase older adults' physical activity. However four gaps of knowledge regarding physical activity were found including: 1) there is a lack of study about these predictors in those living in urban poor communities; 2) they have been limited in certain older adults' overall physical activity studies; 3) physical environments and social cultural environments underpinning of older adults physical activity were neglected; and 4) the interaction among intra personal, inter personal, and extra personal factors have not been considered.

Thus, in order to fill these gaps of knowledge and ultimately work to increase or maintain physical activity of older adults living in urban poor communities, this study will examine factors predicting physical activity in this under-studied group. The concepts from HPM which are physical activity self-efficacy, social support, neighborhood environment and facilities, perceived physical health and perceived mental health and the concept from the SEM which is a sense of community, are selected in the framework. The benefits of this study will provide a guidance in designing effective interventions and policy in order to increase and maintain physical activity or active living for these specific groups.

CHAPTER III
METHODOLOGY

The aim of this study was to determine the factors that predict physical activity in older Thai adults living in urban poor communities. Research methodology is addressed in this chapter.

Research Design

A cross-sectional survey design that retrospectively asked older Thai adults living in urban poor communities about physical activity, physical activity self-efficacy, social support, perceived physical health, perceived mental health, a sense of community, and the neighborhood environment and facilities was designed to determine the factors predicting physical activity.

Population

The target population is older Thai adults living in urban poor communities across Bangkok Metropolitan which was equal to 71,401 persons (The Statistical Forecast Bureau, 2007).

Sample

The subjects who met the following criteria were recruited into this study.

Inclusion criteria

1) Both males and females aged 60 years old or above
2) Reside in urban poor communities for more than 1 year
3) Earn income of less than 2,000 Baht per month
4) Willing to participate
5) Have no cognition and perception problem determined by the Chula Mental Test score of 15 or more

Sample Size

According to Cochran (1977), sample size was calculated following this formula (Cochran, 1977, p. 75-76).

$$n = \frac{\frac{t^2PQ}{d^2}}{1 + \frac{1}{N}\left(\frac{t^2PQ}{d^2} - 1\right)}$$

In this study, alpha = .05 for two tails was used therefore t = 1.96

P = The sample proportion of older adults' exercise = 0.414
(National Statistical Office, Thailand, 2008)

Q = 1-P =0.586

d = The margin of error which was equal to .0621 (15% of P)

N= Total population of older adults living in urban poor communities in Bangkok was equal to 71,401 persons
(The Statistical Forecast Bureau, 2007)

From this calculation, a sample size of 242 was the minimum requirement. In this study an attrition of 5% was employed, therefore, a sample size of 258 was used.

Setting

Data were collected at the subjects' house located in urban poor communities in Bangkok.

An urban poor community refers to a community, of which, the density is equal to or more than 15 households per rai (1 rai =1,600 square meters), and the environmental conditions are so unsanitary, dilapidated, and disorganized that it may affect the dwellers' health and/or safety (Bureau of Social Development, 2008). There are many urban poor communities spreading across Bangkok, both registered and non-registered. Regarding the number of urban poor communities in Bangkok, the Bureau of Social Development (2008) reported 806 registered urban poor communities, also the Community Organizations Development Institute (Public Organization) (CODI) (2008) reported 1,898 non-registered urban poor communities. These two sources of

information suggest that both registered and non-registered communities are encompassed or included in some districts, whereas, some only included non-registered communities. Furthermore, the areas of these two types of communities overlapped each other. Because of the differences between the two types of urban poor communities, in this study, the researcher selected only registered urban poor communities to study.

Sampling technique

A multi-stages sampling was used to obtain a probability sample of older Thai adults living in urban poor communities by following these three steps:

Step 1 - Due to studying only registered urban poor communities, the researcher started the sampling with identifying districts which have non-registered urban poor communities from three zones of Bangkok; the inner zones (21 districts), middle zone (18 districts), and outer zone (11 districts). Therefore, the following districts: Sumpanthawong (inner zone), Meanburi, Khlongsamwa, Nongjok and Tawewatana districts (outer zone) were excluded. Then one district was selected from each zone using a simple random sampling method with proportional sampling zone, inner: middle: outer = 3: 2: 1.

Step 2 - In each selected district, one registered urban poor community was selected by simple random sampling using the name list.

Step 3 - In each selected urban poor community, participants were selected by simple random sampling using the name list of older adults. Every 3rd person on the list was selected. In communities without the older adult's name list, the convenience sampling method was used. Forty three participants from each selected community were recruited based on the research criteria. The sampling frame and the districts' name are illustrated in Figure 3.

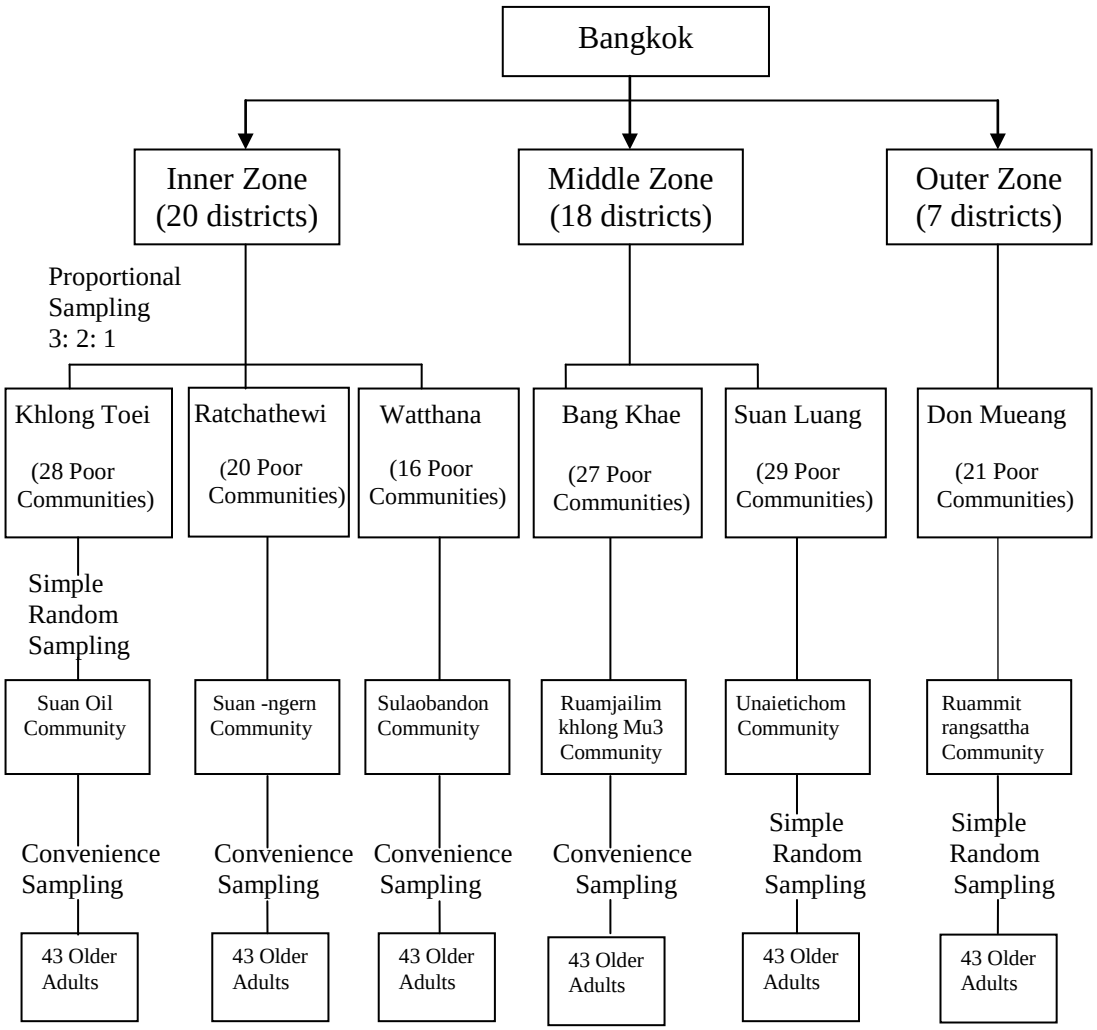

Figure 3: Sampling Frame

Instruments

Seven sets of questionnaires were used to measure all conceptual constructs including: 1) the Modified Physical Activity Questionnaire for Older Thai Adults, 2) the Physical Activity Self-Efficacy Questionnaire, 3) the Social Support for Physical Activity Questionnaire, 4) the Neighborhood Environment Scale, 5) the Sense of Community Scale, 6) the Short Form-36 Health Survey (SF 36) (version2) (The physical composite summary), and 7) the Health Related Self Reported (HRSR) Scales: The Diagnostic Screening Test for Depression in the Thai Population. Demographic data was also gathered by the questionnaire while older adults' cognitions were screened by the Chula Mental Test. The detailed of the conceptual constructed measurements are summarized in Table 1 and presented in detail below.

Table 1 Summarized Variable, Measurements, and Measure (Pilot Study)

Variable	Measurements	Measure
Physical Activity	The Modified Physical Activity Questionnaire for Older Thai Adults modified from the Self Report Physical Activity Questionnaire for Older Thai Adults (SPAQ) (Visuthipanich, 2009)	Physical Activity Score
Physical Activity Self-Efficacy	The Physical Activity Self-Efficacy Questionnaire modified from the Perceived Self Efficacy for Exercise Questionnaire (Chinuntuya, 2001)	Physical Activity Self-Efficacy Score
Social Support	The Social Support for Physical Activity Questionnaire modified from the Social Support for Exercise Questionnaire (Chinuntuya, 2001)	Social Support Score
Neighborhood Environments & Facilities	The Neighborhood Environment Scale translated and modified from the Neighborhood Environment Walk ability Scale-Abbreviated (NEWS-A) (Cerin et al., 2006)	The Neighborhood Environment & Facilities Scor
A Sense of Community	The Sense of Community Scale translated and modified from the Sense of Neighborhood Scale (Young et al., 2004).	The Sense of Community Score
Perceived Physical Health	The Short Form-36 Health Survey (SF 36) (version2) (The physical composite summary) originally developed from Ware & Sherbourne (1992) translated to Thai by Jirarattanaphochai and others (2005)	Perceived Physical Health Score
Perceived Mental Health	The Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population (Kasantikul et al., 1997)	Perceived Mental Health Score

1) Demographic Questionnaire

This questionnaire was developed by the researcher. It contained 18 items including sex, age, religious, height, weight, marital status, education, occupation, income, health problems or chronic illness, current risky behaviors (smoking and drinking), the number of children, the persons whom resided with the older adults, the owner of older adults' living place, the number of years that older adults stayed in this urban poor community, plans to move from this community, and close relatives in this community (Appendix F).

2) Chula Mental Test (CMT)

This test was used to evaluate cognitive functions and dementia symptoms in older adults. It was originally developed by Jitapunkul and others (1996) and was composed of 13 main items. Items 5 and 12 contained 2 sub-items while items 3 and 13 concluded 3 sub-items (Appendix F). Responses were coded on the dichotomous scale of 0 (incorrect) and 1 (correct). Possible summations of all items represented the older adults' cognitive functions ranging from 0-19. The scores of 0-4 referred to severe, 5-9 referred to moderate, 10-14 referred to mild cognitive impairment and a score of 15-19 referred to normal cognitive function.

This measurement was first tested in 212 older adults having no evidence of psychiatric, behavioral or psychological disturbance, living at home in Bangkok. The validity of the CMT was evaluated by expert panels. It was also tested by being compared with the Mini-Mental State Examination (MMSE) and the Abbreviated Mental Test (AMT). The results showed the correlation between both the MMSE and the AMT accounted for .78. The CMT had a100 % sensitivity and 90 % specificity for detecting dementia which the cut-off point was 15. The test-retest kappa coefficient and internal consistency were .65 and .81, respectively. The reliability was tested in 30 older adults living in their homes in Khlong Toei community by Chinuntuya (2001). The KR 20 reliability coefficient was .84.

In this study, reliability was tested in 15 older adults living in urban poor communities by the researcher before being used in the main study. The Cronbach's Alpha coefficient of this screening test was .77.

3) The Modified Physical Activity Questionnaire for Older Thai Adults

Physical activity was measured by the Modified Physical Activity Questionnaire for Older Thai Adults modified from the original Self Report Physical Activity Questionnaire for Older Thai Adults (SPAQ) (Visuthipanich, 2009). The original survey was a self report of physical activities developed by older Thai adults living in a community in Bangkok. It was composed of 55 items designed to measure four kind-habitual physical activities in the previous 7 days. These were household, occupational, leisure, and transportation activities. Likert scales were defined as 0 to 1 hour, more than 1 to 3, more than 3 to 5, more than 5 to 7, more than 7 to 9, and more than 9 hours. For each activity the weekly physical activity score was calculated by multiplying total hours a day using the MET value (MET-Hr/wk = Total hr. /wk × MET). Each specified activity was adjusted to MET value, depending on the intensity. The total physical activity score was the summation. All physical activity was categorized into three levels based on the summation. Light activities referred to those with the intensity less than 3 METs (metabolic equivalent); moderate activities referred to those with the intensity between 3 to 5.9 METs, and vigorous ones referred to the activities with an intensity of 6 METS and greater.

The scale was tested by Visuthipanich (2009) in 550 older Thai adults living in communities in Bangkok. This scale provided a good predictive validity indicated by the correlation coefficient between this measurement and the Six-Minute Walk Test ($r = .75$, $p=.05$). The results showed a correlation coefficient of .31 ($p=.01$). The total reliability coefficient of the whole instrument was .93, and the subscales reliability ranged from .68 to .96. Although this measurement was developed to assess physical activity among older Thai adults in communities, it may not be appropriate for those living in urban poor communities which had different living conditions. Therefore, to suit the older adults living in this specific setting, unclear items and unrelated entries to the context of the sample were modified or removed to reach appropriateness. The final questionnaire contained 46 items.

Content validity was established by five experts in this field (Appendix D). Polit and Beck (2008) suggested method to calculate scale level CVIs (S-CVIs) by averaging the item CVI (I-CVI). The item CVI (I-CVI) is computed as the number of

raters giving a rating of 3 or 4 divided by the number of experts. This method is called S-CVI/Ave. The value of .90 is suggested as an excellent content validity. In this study, the scale level CVIs was .95. It was piloted in 15 older adults living in urban poor communities.

The results from the pilot study found that some items were not appropriate within the urban poor older adults' context. These items were deleted. Two items "Listen to radio" and "walking up and down stairs" were added. This resulted in a scale with 42 items (Appendix F). The response did not change from the original version. The code book for the modified physical activity questionnaire and the summary of weights for selected items of physical activity were adjusted following the Compendium of Physical Activity (Ainsworth et al., 2000) and Visuthipanich (2009) guideline (Appendix F). The two week test- retest reliability was equal to.98.

4) The Physical Activity Self-Efficacy Questionnaire

Physical Activity Self-Efficacy was measured by the Physical Activity Self-Efficacy Questionnaire modified from the Perceived Self-Efficacy for Exercise Questionnaire initially developed by Pender (1996) and later adopted by Chinuntuya (2001). The original measurement was developed based on the self efficacy theory (Bandura, 1997) aiming to assess an adolescent's confidence to engage in exercise behaviors when faced with barriers. The original version was translated and modified by Chinuntuya (2001). A 14 item questionnaire was used to assess the older adults' confidence to engage in both leisure exercise and lifestyle exercise. Older adults were asked to rate their confidence on a scale provided ranging from 1 (not at all true) to 5 (very true). Chinuntuya (2001) tested for reliability with 30 older adults in the Khlong Toei community. The Cronbach's alpha Coefficient for perceived self efficacy for leisure exercise and lifestyle exercise was .92 and .93, respectively.

In this current study, physical activity is focused on all kinds of activity in daily life. Therefore, perceived self efficacy for lifestyle and leisure exercise were combined together; and it was named as physical activity self-efficacy. Furthermore, some items and scales were modified. The participants were requested to rate the degree of confidence ranging from 0 % (cannot do at all) to 10% (certain can do) to the following question: "How sure are you that you can perform physical activity

under various barriers?" Based on further literature reviews and recommendation from experts, some items which may have redundancy were deleted. Furthermore, one item ("you could perform physical activity even if you feared of falling, injury and/or accident") was added. The final questionnaire contained 12 items which composed of two subscales: internal conditions (item 1-8) and external conditions (item 9-12) (Appendix F). Computed a sum score, the possible scores ranged from 0 to 120. Higher score referred to higher perceived physical activity self-efficacy.

In this study the physical activity self-efficacy score was classified into three categories including: 1) low physical activity self-efficacy (score 0 to 40.00); 2) moderate physical activity self- efficacy (score 40.01 to 80.00); and 3) high physical activity self-efficacy (score 80.01 to 120). The questionnaire was validated by five experts in this field (Appendix D). The scale level CVIs was .92. A pilot study was conducted in 15 older adults living in urban poor communities for reliability testing. The results found that the Cronbach's Alpha coefficient was .89.

5) The Social Support for Physical Activity Questionnaire

Social support was measured by the Social Support for Physical Activity Questionnaire modified from the Social Support for Exercise Questionnaire (Chinuntuya, 2001), initially developed by Pender (1996). Original measurement was developed based on the HPM (Pender, 1996) aiming to assess how often the adolescents' family and friends support them in performing exercise behaviors. Chinuntuya (2001) translated and modified the scale in order to measure the older adults' family and friends support when older adults performing two types of exercise: leisure (13 items) and lifestyle (12 items). All items were composed of emotional, tangible, and informational social supports. The answer for each item was coded into 4- point Likert scale ranging from 0 (don't know) to 3 (often). It was tested for reliability in 30 older adults in Khlong Toei community by Chinuntuya (2001) which Cronbach's alpha Coefficient for social support for leisure exercise and lifestyle exercise was .89 and .83, respectively.

As mentioned in this current study physical activity is focused on all types of activities in daily life. The researcher combined social support for lifestyle and leisure exercise together using the term social support for physical activity. Based on

the content experts' recommendation, the final questionnaire contains 11 items which composed of support from both family and friends including: a) emotional support, item #1, 2, 3, and 4); b) tangible support, item #5, 6, 7, and 8; and c) information support, item #9, 10, and 11 (Appendix F). Each answer was coded on 3- point Likert scale ranging from 1 (never) to 3 (often). Computed a sum score, the possible score ranged from 22-66. Higher score referred to greater social support.

In this study the social support score was classified into three categories including: 1) low social support (score 22.00 to 36.66); 2) moderate social support (score 36.67 to 51.33); and 3) high social support (score 51.34 to 66.00). Contents were validated by five experts in this field (Appendix D). The scale level CVIs was .95. The pilot study was conducted in 15 older adults living in an urban poor community. The Cronbach's Alpha coefficient was .84.

6) The Neighborhood Environment Scale

The neighborhood environment and facilities was measured by the Neighborhood Environment Scale modified and translated from the Neighborhood Environment Walk Ability Scale--Abbreviated (NEWS-A) (Cerin et al., 2006). NEWS-A (54 items scale) is an abbreviated version of the Neighborhood Environment Walk Ability Scale (NEWS) (98 items scale) (Saelens et al., 2003). It determined the participants' perception of neighborhood features which were hypothesized to be related to physical activity, particularly walking for transportation and for recreation.

The original 54 items scale were classified into 8 subscales; a) residential density, b) land used mix-diversity, c) land used mix-access, d) street connectivity, e) infrastructure and safety for walking and cycling, f) aesthetics, g) traffic hazards, h) crime, and four single items. Subjects were questioned to determine more information about the way that they perceive or think about their neighborhood. Answers and the scores of each item were different depending on the subcategories. It was employed in Cerin et al's study (2006) with 1,286 adults. The results revealed that the NEWS-A possessed an adequate factorial levels and criterion validity. Since the NEWS-A consisted of many subscales, single reliability index did not exist, but the test–retest reliability for all items was above .75.

Since this scale was initially developed in English, after being given permission from the developers (Appendix B), it was translated into Thai by the researcher. Additionally, to validate, this questionnaire was translated back into English by a bilingual expert who is able to speak both English and Thai (Appendix E) following the Burn and Grove (2005) method. The qualification required for the bilingual expert is an international doctoral level in nursing and not involved in the original translation. The conceptual and linguistic accuracy of the back-translated questionnaires then were reviewed by an English native speaker. Also, discrepancies were identified and revised by the English native speakers until the discrepancies were resolved. In this study, discrepancies were identified and revised by the developer (English native speaker) (Appendix E) then the contents were validated by 5 Thai experts (Appendix D).

Based on the content experts' recommendation, subscale a: residential density and subscale b: land-used mix-diversity were deleted because these two subscales did not correspond with the definition of term of neighborhood environment and facilities in this study. After deleting these subscales, in order to retain the coverage of all dimensions in the construct, the items in subscale c: land used mix-access were modified. Also, one item was added. From the initial 54 items, 25 items remained including 6 subscales: subscale a) land used mix-access (4 items), b) street connectivity (2 items), c) infrastructure and safety for walking and cycling (4 items), d) aesthetics (4 items), e) traffic hazards (3 items), f) crime (3 items), and four single items. The scale level CVIs was .92.

The pilot study of 15 older adults living in an urban poor community was conducted for reliability testing. The results found that the Cronbach's Alpha coefficient was .77. Three items which were deemed inappropriate within the context of urban poor community were removed and three items which were difficult to understand were modified and grouped into related subscales. The final scale had 22 items, 6 subscales; a) service accessibility (4 items), b) street connectivity (3 items), c) infrastructure and safety for walking and cycling (6 items), d) aesthetics (4 items), e) traffic hazards (2 items), and f) crime (3 items) (Appendix F). The scoring of all items in subscale a, b, c, and d were 1 (strongly disagree) to 4 (strongly agree) while all items in subscale e and f were conversely scored, 4 (strongly disagree) to

1(strongly agree). The mean scores from all subscales were summed. The possible score ranged from 6-24. Higher score referred to a more favorable value of the neighborhood environment and facilities or higher physical activity performing.

In this study the neighborhood environment and facilities score was classified into three categories including: 1) low favorable value of the neighborhood environment and facilities (score 6.00 to 12.00); 2) moderate favorable value of the neighborhood environmental and facilities (score 12.01 to 18.00); and 3) high favorable value of neighborhood environmental and facilities (score 18.01 to 24.00).

7) The Sense of Community Scale

The sense of community was measured by the Sense of Community Scale which was translated and modified from the Sense of Neighborhood Scale (Young et al., 2004). The Sense of Neighborhood Scale is one subscale in the Sense of Belonging to a Neighborhood Scale. The Sense of Neighborhood Scale (7 items) was designed to measure a respondents' neighborhood preference. The instruction inquires "What do you think best applies to you and your neighborhood?" The responding answers are coded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores reflect greater satisfaction.

The Sense of Neighborhood Scale was tested in 9,445 women aged 73–78 years by Young et al (2004). Its scores showed good face validity and good construct validity. A relationship was found between a higher score on this factor and better physical and mental health, lower stress, better social support and being physically active. Women reporting a sedentary lifestyle had a lower sense of neighborhood scores than those reporting being physical active. The Cronbach's alpha coefficient in the Sense of Neighborhood items ranged between .68 and .80.

In this study, after receiving the permission from the developers (Appendix B), this questionnaire was translated into Thai by the researcher and back-translated into English by a bilingual expert (Appendix E). Discrepancies were identified and repeated until the problems were resolved by the developer (English native speaker) (Appendix E). Contents were validated by 5 experts (Appendix D). The scale level CVIs was .92. Furthermore, two items which were: "In your community, there is ritual activity that you mostly participated in" and "You and your neighbors get

together for activities such as activity for community problem solving" were added following the content expert recommendation. The completed scale had 9 items (Appendix F). The responding answers and the interpreting result were still the same. Possible score ranged from 9-45. Higher score referred to greater a sense of community.

In this study a sense of community score was classified into three categories including: 1) low sense of community (score 9.00 to 21.00); 2) moderate sense of community (score 21.01 to 33.00); and 3) high sense of community (score 33.01 to 45.00). The pilot study was conducted in 15 older adults living in an urban poor community for reliability testing. The results showed that the Cronbach's Alpha coefficient was .85.

8) The Short Form-36 Health Survey (SF 36) (version 2)

Perceived physical health was measured by the physical composite summary of the Short Form-36 Health Survey (SF 36) (version 2) (Jirarattanaphochai, Jung, Sumananont, & Saengnipanthkul, 2005) originally developed from Ware and Sherbourne (1992). The original SF36 scale version 2 was designed as an indicator of health status for population surveys. The 36-item questionnaire was composed of an eight-scale profile of scores combined into 2 summary measures: 1) physical component score (PCS) and 2) mental component score (MCS). The PCS comprised: 1) physical functioning (10 items); 2) role limitation due to physical health problems (4 items); 3) bodily pain (2 items) and; 4) general health perceptions (5 items). The MCS is composed of 1) vitality, energy or fatigue (4 items); 2) social functioning (2 items); 3) role limitation due to emotional problems (3 items) and; 4) general mental health covering psychological distress and well being (5 items). Furthermore, the second item asked about changes in health status over the previous year was not scored but it was used to estimate changes in health from across sectional administration of SF36. A four-week recall period was required.

Short Form-36 Health Survey (SF 36) was translated into Thai by Jirarattanaphochai et al (2005) (Appendix F). The reliability was tested by Cronbach's alpha coefficient and item-scale correlation in 100 low back pain patients. The Cronbach's alpha coefficient of the physical health and mental health summary scales

were .93 and .92, respectively, while the Cronbach's alpha coefficient of eight scales in the Thai version of the SF-36V2 was .72 - .94.

In this study, only the PCS of the Thai version of the SF-36 (version 2) (Jirarattanaphochai et al., 2005) was used in order to measure perceived physical health. The answers and scoring process of the PCS were different based on the subcategories (Appendix F). Summing the mean scores from all subscales, possible score ranged from 0-400. A higher score referred to higher perceived good physical health. In this study perceived physical health score was classified into three categories including: 1) low perceived physical health (score 0 to 133.33); 2) moderate perceived physical health (score 133.34 to 266.67); and 3) high perceived physical health (score 266.68 to 400.00). The pilot study was conducted in 15 older adults living in an urban poor community for reliability testing. The result showed that Cronbach's Alpha was .91.

9) The Health-Related Self-Report (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population

Perceived mental health was measured by the Health-Related Self-Report (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population (Kasantikul et al., 1997). This measure contained 20 items of a self administered scale developed to measure the current level of depressive symptomatology. Sixteen items were represented in four symptom areas: 1) vegetative symptoms (item 1, 2, 3, and 14); 2) motivation symptoms (items 6, 8, and 13); 3) cognitive symptoms (item 4, 7, 12, and 16); and 4) psychological or mood (affective) symptoms (item 9, 11, 17, 18, and 19). Three positive items, which were items 5 (feeling well), 10 (life is pleasant and meaningful), and 15 (feeling self worth) and also the question item 20 (have attempted suicide) were added (Appendix F). Participants were asked to check how often they encountered each symptom of depression during the previous two weeks. The responding answers were coded on a 4-point Likert scale ranging from 0 (never) to 3 (frequent, everyday or almost everyday). The 3 positive items (item 5, 10, 15) were conversely scored. Also, item 20 required only a yes/no answer, the score of 3 was given for yes, and 0 for no. Total scores ranged from 0-60. The score at 30 was

used to detect major depression while score of equal to or more than 25 referred to depression.

This scale was tested by Kasantikul and team (1997) in 405 psychiatric patients and 890 control subjects (normal people). The patients were adolescents and adults (age 15-60) who were diagnosed by a psychiatrist as 1) general anxiety disorder, adjustment disorders, and other psychiatric disorder, 2) mild to moderate depression, 3) severe or major depression, and 4) schizophrenia. Severely psychotic cases were not included. The results revealed that Cronbach's alpha coefficient was .91 and the test showed a clear factorial structure and clinical validity. The cut-off score at 30 gave 90.2 per cent specificity and 85.3 per cent sensitivity for major depression while the score equal to or more than 25 provided higher specificity (93.4%) and sensitivity (75.1%) and thus could detect possible cases of depression.

This current study did not use the cut-off score to detect depression but use the total score to indicate perceived mental health. The higher score, the more they perceived poor mental health. A pilot study was performed in 15 older adults living in an urban poor community for reliability testing. The result showed that Cronbach's Alpha coefficient was .86.

Protection of Human Subjects

After being approved by the Institution Review Board for the protection of human subjects at Faculty of Medicine, Ramathibodi hospital, Mahidol University and the Health Department, the Bangkok Metropolitan Administration (Appendix A), the data were collected. Objectives, the procedures for data collection, potential benefit and risks of participation, and the duration of this study were informed to the eligible subjects. The subjects were also informed that participation in the study was voluntary and they could decline without being penalized or losing any benefits to themselves and/or their relatives. Additionally, participants were assured that they could terminate their participation at any time. The researcher used this protection of human rights standard in both the pilot and main studies.

There was no risk for participation, but a potential disadvantage for the subject's participation was that the questionnaire could be time consuming, while the anticipated benefits included the opportunity to evaluate their overall physical activity

and to recognize factors related to physical activity. The findings from this study will be used to facilitate and promote physical activity which outweighs any possible disadvantages. The participants were requested to sign the consent forms before the study began (Appendix C). The participants could decline to answer any question at anytime if they felt uncomfortable. All data was strictly confidential, and reported as a group. Codes were used instead of the names and addresses of participants. After finishing the data analysis, the codes were destroyed.

Pilot Study

The objectives of conducting the pilot study were to 1) test for psychometric properties; 2) reduce random errors by assessing a subject's responses to the instrument; 3) assess accurate timing to complete the instrument; and 4) gain confidence in collecting data and using the instruments (Frank-Stromborg & Olsen, 2004).

Fifteen older adults living in an urban poor community meeting the required criteria were selected to be part of this pilot study. All information relevant to the study was explained to the participants. The participants were asked to sign their name on the consent form, to complete the questionnaires, and to perform an appropriateness and clarity rating for the questions, instructions and format. All instruments used in a pilot study were given in Thai. A structured interview was also used. The participants were encouraged to share their opinions regarding the relevance of the items and the concepts, and the appropriateness of the items pertaining to the cultures of older Thai adults living in an urban poor community as well as to give any additional items that could be potentially measured within each concept. Time spent on the questionnaire completion, including the problems related to questionnaire completion, as well as further comments offered were recorded.

The pilot study was conducted at the Duang Prateep Foundation during March 25th to April 8th, 2009. Data were collected from 16 urban poor older adults following the inclusion. One participant could not complete the questionnaire during the interview session, therefore this case was excluded. The mean age of participants was 69.4 (SD= 5.28). The age was range from 60-78 years. The sample was composed of 13 women (86.7%) and 2 men (13.3%). Eighty-seven percent had completed

elementary school (grade 4). More than a half of the subjects (66.6%) were widowed. Most of subjects did not work (80%) and lived with their children (93.3%). Their monthly income ranged from no income to 1,500 Baht. The average income is 840 (SD= 636.7). Most of older adults had income from their children (86.7%). When combining older adults' income with the government pension that they had just received at the end of March 2009 (500 Baht per month), the total income was range from 500-2,000 Baht. The average income was 1406.6 (SD=650.78). The number of years that older adults had lived in this community ranged from 1 year to 30 years, average was 11.8 (SD=8.6). Half of them planned to move from this community because they were afraid of eviction and some also wanted to live in a better place. All of them had at least one close friend in this community.

Time spent on the questionnaire completion ranged from 45-50 minutes depending on the older adults' education and knowledge. Even though a structured interview with the questionnaire was employed with the participants, some had difficulty answering questions. Thus, those questions which were difficult and inappropriate within the context of urban poor older adults were modified and some were removed. Not only did some older adults have difficulty answering questions, but also appeared fatigued and/or bored. To protect from any measurement error from older adults' fatigue, which is linked to low reliability of the data, in the main study, the interview sessions were divided into two parts. Participants had a 5-10 minute break for refreshment with a beverage after finishing the first session.

Due to the pilot study was conducted at an older adult center where there was ongoing group activity the environment may have affected the subjects' concentration. Furthermore, older adults may be in a hurry to finish the questionnaire in order to return home, hence, in the main study the interview session was conducted at the subject's home. For psychometric properties, overall the questionnaires were acceptable with good psychometric properties. The numbers of items and reliabilities of instruments are summarized in Table 2.

Table 2: Summarized Numbers and the Reliability of Instruments (Pilot study, n=15)

Instruments	Number of items	Reliability
1) The Modified Physical Activity for Older Thai Adults Questionnaire	42	.98
2) The Physical Activity Self-Efficacy Questionnaire	12	.89
3) The Social Support for Physical Activity Questionnaire	11	.84
4) The Neighborhood Environment Scale	22	.77
5) The Sense of Community Scale	9	.85
6) The Short Form-36 Health Survey (SF 36) (version2) (The physical composite summary)	21	.91
7) The Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population	20	.86

Data Collection

In this study, data were collected by the researcher. Data collection proceeded in the following steps:

1) After being approved by the department review committee both the Faculty of Medicine Ramathibodi hospital, Mahidol University and the Health Department, Bangkok Metropolitan Administration, the researcher sent out the information letter from the Faculty of Graduate Studies, Mahidol University to the directors of public health centers of the selected districts.

2) The researcher then introduced herself to the directors of public health centers, community nurses, community leaders, and health care volunteers or older adult volunteers as well as explaining the research's purposes of how this study will benefit the community as a whole.

3) The researcher accessed participants through a name list of older adults in cases where the selected urban poor communities had a name list. Using simple random selection, the potential participants were chosen by selecting every 3rd person on the list. The researcher coordinated with health care volunteers to make an appointment with each potential participant. The researcher randomly selected another

potential participant if the selected case's house was not safe for the researcher to access. This decision was under the recommendation of health care volunteers. Convenience sampling was used, when the selected community did not have a name list of older adults.

4) All potential participants were approached by the researcher. If a subject declined to participate in this study or did not meet the inclusion criteria, the next older adult's name on the recruitment list was selected.

5) The researcher then established the relationship with the potential participants and informed them of the study purpose, time, and questionnaires. Then, the participants were asked to sign a consent form. After signing the consent form, data collection was completed within one visit in order to be convenient for both the participant and the researcher when possible. To avoid any social desirability bias, the researcher conducted the interview at the participant's house or in a convenient place with no interruption.

6) The researcher explained information about the questionnaires and how to answer each question. A structured interview was used. The participants could ask the researcher for clarification any time if they did not understand the question or if any problems occurred. The researcher divided the interview session into two sessions by starting the first session with the screening test, the demographic questionnaire, the physical activity questionnaire, the physical activity self-efficacy questionnaire and the social support for physical activity questionnaire, respectively then the participants had a 5-10 minute break for refreshment with dessert if they wanted. In the second session, the participants were interviewed with the neighborhood environment scale, the sense of community scale, the physical composite of SF36 (version 2) and the HRSR Scale, respectively. Time spent on the questionnaire completion was approximately 45-50 minutes.

7) After finishing the interview, the researcher checked all given answers of all instruments for the completeness and accuracy. Then, all the participants received remunerative gifts from the researcher.

Data Analysis

Data were analyzed using statistics as follows:

1) Descriptive statistics, executed by the Software Product for Service Solutions (SPSS) version 17.0 (Predictive Analytic Software, PASW), Mahidol University license, were used to describe the characteristics of the sample, including frequency, percentages, means, range and standard deviation. Furthermore, the distribution properties (symmetry, skewness and kurtosis) were used to examine the demographic variables and the chosen variables

2) Inferential statistics executed by SPSS 17.0 (PASW), Mahidol University license, were used to determine the reliability of the instruments, including Cronbach's Alpha Coefficient and two week test-retest reliability. Furthermore, additional statistics which were multiple regression with enter method was done to explore the factors influencing physical activity before conducting Path analysis. In addition independent t-test and ANOVA were used to compare variable characteristics.

3) Path analysis executed with the LISREL program, version 8.52, which was provided by Mahidol University, then was used to answer the research question and test for research hypotheses.

In this study, the procedures for data analysis were presented as follows:

1) Data were checked for missing information and was cleaned to ensure the accuracy by using descriptive statistics (run frequencies and explore characteristics of the variables). If there was something incorrect, the researcher re-checked the input with the raw data and corrected the data entry error.

2) Assumptions of Path analysis were tested. Because Path analysis consists of a series of regression equations, therefore, the assumptions which are related to multiple regression, including the assumptions of normal distributions, homoscedasticity, linear of all relationships and multicollinearity were tested (Munro, 2001).

3) Then the hypothesized model was tested through the goodness of fit test statistics. If the model did not fit the data, the model was modified based on modification indices suggestion and theoretically based principles to improve the overall test for the model fit. In this proposed model, there were four exogenous variables which were: social support, neighborhood environment and facilities,

perceived physical health and perceived mental health. Also three endogenous variables were: physical activity self-efficacy, a sense of community, and physical activity which was the outcome variable.

Summary

A cross-sectional survey design was used to determine the factors predicting physical activity in older Thai adults living in urban poor communities. Multi-stage sampling was employed to obtain 258 older adults living in urban poor communities. Participants were retrospectively asked about physical activity, physical activity self-efficacy, social support, perceived physical health, perceived mental health, a sense of community, and neighborhood environment and facilities. Furthermore, demographic data, mental status and cognition were assessed. A pilot study was conducted using fifteen older adults living in an urban poor community. The results showed that no problems occurred during data collection and all measurements had acceptable psychometric properties. The demographic and the chosen variables were analyzed by descriptive statistics and the reliability of measurements was analyzed by inferential statistics using the SPSS 17.0 (PASW).

CHAPTER IV
RESULTS

This chapter is organized into two sections. The first section illustrates the characteristics of the sample and the independent variables influencing physical activity. The second section depicts the testing method for the proposed models and hypotheses.

Characteristics of Samples and Independent Variables

Descriptive Statistics for Samples

The samples for this study were 258 older adults living in urban poor communities across Bangkok Metropolitan, who have resided in the community at least more than 1 year, earned income less than 2,000 Baht per month and had no cognitive and perception problems detected by the Chula Mental Test.

Subjects were comprised of 190 female (73.6%) and 68 male (26.4%). The age of subjects ranged from 60 to 88 years (mean=69.85, SD= 6.38). Approximately half (48.8%, n=126) were between ages 60-69 years (young old). The majority of subjects (70.2%) were Buddhists, while 25.5% were Muslim and 4.3% were Christian. Around half (47.3 %) were married and 39.9% were widowed. Most of them (76%) finished primary school, while 9.3% had no education.

The majority of the subjects (71.7%) were unemployed, whereas, 28.3 % had a job. For the subjects who were employed, their jobs were vendors, laborers, barbers, general employees, health care volunteers and so on. They earned income from their jobs, while 44.9% were supported by their family. Only 26.8% were unemployed and reported that they received no financial support from any family. According to the recent legislative policy of the Thai government, all adults aged 60 years and over will receive a pension from the government of 500 Baht monthly.

Therefore, the older adults' monthly income ranged from 500-2,000 Baht per month (mean=1,317.83 SD= 625.40).

The subjects had an average height and weight of 156.28 cm (SD=8.56) and 61.39 kg (SD= 11.84), respectively. Their Body Mass Index (BMI) ranged from 11.72 to 44.44 kg/m^2 (mean= 25.21, SD= 4.99). Many of them (48.8%) were normal weight while 29.1% were overweight, 16.7% were obese, and 5.4% were underweight. Regarding their health status, only 16.7% (n= 43) reported having no chronic disease whereas 32.9%, 26.3%, 12.4%, 7.8% and 3.9% reported having one to five chronic diseases, respectively. The most three common chronic diseases were hypertension (47.7%), diabetes mellitus (22.9%), and osteoarthritis and joint problems (22.9%). Furthermore, in cases that had received treatment for hypertension, their systolic blood pressure ranged from 100 to 215 (mean = 135.22, SD= 25.01) and diastolic pressure ranged from 67 to 130 (mean= 84.66, SD=11.74). For health risk behaviors, the majority of them were non smokers (91.9%) and non drinkers (95.7%). In those cases that were smokers and alcohol users the number of cigarettes they smoked was averagely 9.7 rolls per day while the amount of alcohol they consumed was only a sip of drink averagely 5 cc per day.

Regarding the number of living children, older adults had 0-9 males and 0-7 female offspring. Half of the participants (50%) lived with their offspring and grandchildren while 6.6% lived alone. Around 60% lived in their own home. In cases that the house belonged to older adults, around half of them (54.8%) were built in an invaded land, 38.1% were built on rented land and 7.1% was built on their own land. Most of them (82.2%) live in this community more than 10 years (mean= 33.61, SD=21.19). The maximum of years living in this community is 80.

A majority of older adults (83.7%) had no plan to leave their communities. The three most common reasons given were 1) having no other place to live (55.3%), 2) born here and familiar with environment (16.4%), and 3) this place is convenient for transportation and easy for earning income (13.3%). Approximately, 16.3% of subjects had made plans to move out. The most three common reasons were: 1) land eviction by the land authority (44.4%), 2) poor environment and sanitation (such as bad odors, congested and dilapidated areas, noisy, etc.) (33.3%), and 3) moving back to a rural area (13.4%). Most of older adults (84.5%) had close friends and/or relatives in their communities. The details of the demographic data are presented in Table 3 and Table 4.

Table 3: Demographic Characteristic of the Sample (n= 258)

Items	N	%
Gender		
Female	190	73.6
Male	68	26.4
Age (Years in group)		
60-69	126	48.8
70-79	114	44.2
80-89	18	7.0
Religious		
Buddhism	181	70.2
Islam	66	25.5
Christianity	11	4.3
Marital Status		
Single	7	2.7
Married	122	47.3
Widowed	103	39.9
Divorced/ Separated	26	10.1
Education Level		
No education	24	9.3
Primary school	179	76.0
Secondary school	33	12.8
Vocational school	5	1.9
Occupation		
No	185	71.7
Yes	73	28.3
Income (Baht per month)		
Equal to 500	69	26.7
501-1,000	45	17.4
1,001-1,500	44	17.1
1,501- 2,000	100	38.8
Living Company		
Live alone	17	6.6
Spouse	24	9.3
Spouse and offspring	82	31.8
Offspring and grandchildren	129	50.0
Sibling	6	2.3

Table 3: Demographic Characteristic of the Sample (n= 258) (continued)

Items	N	%
Numbers of Years Living in this Community (mean= 33.61, SD=21.19, Range= 1-80)		
1- 10	46	17.8
11-20	39	15.1
21-30	40	15.5
More than 30	133	51.6
Living arrangement (house's owner)		
Older adult	156	60.5
Other (n=102, 39.5%)		
- Their children	50	49.0
- Their spouse	24	23.5
- Their son and daughter in law	6	5.9
- The landlord	22	21.6
Plan to move out from current living place		
Have no plan	216	83.7
Have a plan	42	16.3
Reasons for having no plan to move out*		
Have no place to live	125	55.3
Born here and familiar with environment	37	16.4
Convenient for transportation and earning income	30	13.3
Have relatives and closed friend	14	6.2
Too old to move out	14	6.2
No money to move out	20	8.8
Reasons for relocation**		
Land eviction from the land authority	20	44.4
Poor environment and poor sanitation	15	33.3
Moving back to rural area	6	13.4
Living together with their offspring or friends	4	8.9
Having close friends or relatives in this community		
No	40	15.5
Yes	218	84.5

Note * = one person can give more than one answer

Note ** = one person can give more than one answer

Table 4: Chronic Disease, Health Risk Behaviors and BMI of the Sample (n= 258)

Item	N	%
Number of chronic diseases (mean=1.7)		
0	43	16.7
1	85	32.9
2	68	26.3
3	32	12.4
4	20	7.8
5	10	3.9
Chronic disease[***]		
Hypertension	123	47.7
Diabetes Mellitus	59	22.9
Osteoarthritis and joint problems	59	22.9
Heart and vascular disease	29	11.2
Visual problem	33	12.8
Lung disease	4	1.6
Cancer	5	1.9
Varicose vein	4	1.6
Others		
- Hyper lipidemia	40	15.5
- Allergy	7	2.7
- Peptic Ulcer	5	1.9
- Injury at arm or back or leg	6	2.3
- Migraines	5	1.9
- Paralyze or Paraplegia	6	2.3
- Prostate gland edema	5	1.9
- Renal failure	6	2.3
- Thyroid disease	2	0.8
- Parkinsonism	2	0.8
Health risk behaviors		
Smoking cigarette	21	8.1
Drinking alcohol	11	4.3
BMI (mean= 25.21, SD= 4.99)		
Less than 18.5 (underweight)	14	5.4
18.5- 24.9 (Normal)	126	48.8
25- 29.9 (Overweight)	75	29.1
≥30 (Obesity)	43	16.7

Note [***] = one person can give more than one answer

Descriptive Statistics for Study Variables

Physical Activity

The total score of physical activity was computed by multiplying total hours per week by corresponding MET value for each activity and then summing all above. In this study the total score of physical activity ranged from 1.46-399.77 (mean=120.33, SD= 68.77). The researcher followed the original physical activity codebook (Visuthipanich, 2009) creating new duration variables or total hours per week for each activity were recoded for testing hypotheses. Therefore, the total score of physical activity ranged from 1.25-216.75 (mean=81.38, SD=38.64). The skewness and kurtosis coefficients were 0.49 and 0.43 indicating a normal distribution. The results indicated that in the previous seven days, the majority of older adults performed various types of physical activity including household activity (94.2%), recreation (99.2%), exercise (73.6%), religious activity (66.3%), transportation (85.7%), and stair climbing (39.1%). Some performed caretaking (12.4%), occupational activity (37.6%), and health care volunteers (8.5%) (Table 5).

Table 5: Physical Activity of the Sample Performed in the Past Week (n= 258)

Characteristic	N	%
Household activities		
No	15	5.8
Yes	243	94.2
Taking Care others		
No	226	87.6
Yes	32	12.4
Occupational activities		
No	161	62.4
Yes	37	37.6
Recreation (Watching TV, Listening to Radio, Reading)		
No	2	0.8
Yes	256	99.2
Exercise		
No	68	26.4
Yes	190	73.6
Volunteer activities		
No	236	91.5
Yes	22	8.5
Religious activity		
No	87	33.7
Yes	171	66.3
Transportation activities		
No	37	14.3
Yes	221	85.7
Stair climbing		
No	157	60.9
Yes	101	39.1

Furthermore, the results showed a significant difference in the physical activity mean score among age groups ($F= 15.13$, $p<0.001$). Young older adults had the highest mean physical activity score (mean=141.89, SD=69.14), while moderate and the oldest older adults had lower mean scores of 103.89 (SD=61.49) and 73.53 (SD=59.76), respectively. In addition, young older adults (60-69 years) participated in more types of physical activity such as household, occupation, recreation, exercise and transportation, with more intensity than the moderate and the oldest older adults. Only recreation activities showed different patterns in that the oldest old performed more recreation activities than moderate older adults while young old performed the most (Table 6).

Table 6: The Comparison of Older Adults' Physical Activity among Young Old, Moderate Old and the Oldest Old Group

	Young Old (n=126)		Moderate Old (n=114)		Oldest Old (n=18)		F value
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	
Total Physical Activity	141.89	69.14	103.89	61.49	73.53	59.76	15.13***
Level of intensity							
- Light MET	101.42	53.10	76.89	49.92	58.35	45.81	
- Moderate MET	37.29	49.99	24.12	32.90	15.19	24.49	
- Vigorous MET	3.18	22.34	2.88	11.35	-	-	
Types of Activity							
- Household	41.22	26.91	24.94	24.46	12.71	15.42	
- Occupation	34.76	59.93	25.66	42.82	5.18	21.18	
- Recreation	51.70	30.31	43.39	29.31	49.99	37.27	
- Exercise	5.46	9.45	4.51	10.18	2.44	4.08	
- Transportation	8.75	12.92	5.38	6.16	5.22	6.53	

* $p < .05$, ** $p<.01$, *** $p<.001$

Moreover, the results showed a significant differences in the physical activity mean scores between males and females ($t= -2.55$, $p<.05$). Female older adults had a mean score of 126.80 (SD=67.81) while males had a mean score of 102.26 (SD=68.57). Females performed more light and moderate intensity physical activity than males while males performed more vigorous intensity physical activity than females. Furthermore, females performed more varied physical activities such as household, occupation, and recreation than males while males performed exercise and transportation than females (Table 7).

Table 7: The Comparison of Physical Activity between Male and Female Older Adults

	Male (n=68)		Female (n=190)		T Value
	Mean	**SD**	**Mean**	**SD**	
Total Physical Activity	102.26	68.57	126.80	67.81	-2.55*
Level of Intensity					
- Light MET	68.73	49.21	94.32	52.82	
- Moderate MET	28.75	41.28	30.35	42.73	
- Vigorous MET	4.80	29.31	2.11	10.07	
Type of Activity					
- Household	19.69	21.62	36.46	27.20	
- Occupation	25.31	51.67	29.88	51.40	
- Recreation	36.88	26.56	45.91	30.23	
- Exercise	12.32	18.81	7.91	10.88	
- Transportation	8.04	15.78	6.64	7.21	

* $p < .05$, ** $p<.01$, *** $p<.001$

Most of older adults (99.2%) performed recreations such as watching television (93.4%), reading newspaper and religious book (44.6%), and listening to radio (26.4%). Furthermore most of them (94.2%) performed household activity with light intensity such as food preparing (60.1%), dish washing (71.7), and watering plants with hose and pipe (56.6%) and moderate intensity such as mopping the floor (72.5%), washing clothes with hand (53.9%), and cleaning the bathroom (32.9%) (Table 8).

Regarding exercise behaviors, 73.6% reported they engaged in exercise behaviors. Most of them engaged in light intensity exercise. The two most common light intensity forms of exercise were moving their arms and legs (57.8%) and walking leisurely for exercise or pleasure (53.1%), while the two most common moderate intensity forms of exercise were brisk walking (10.9%) and aerobic dance (9.3%) (Table 8). The goal of the Thai National Health Policy (2001) aimed to promote 30 minutes of moderate physical activity for 5 days per week or 20 minutes of vigorous intensity 3 days per week. Only 20.2% of older adults who engaged in exercise meet this goal.

Table 8: Characteristic of Physical Activity of the Sample (n=258)

Characteristic	n	%
Household activities		
- Mopping the floor	187	72.5
- Dish washing	185	71.7
- Food preparation	155	60.1
- Watering plants with hose or dipper	146	56.6
- Washing clothes with hands	139	53.9
- Cleaning the bathroom	85	32.9
- Washing clothes with machine	60	23.3
- Preparing pet food and feeding pet	38	14.7
- Ironing	33	12.8
- Cleaning pet (dog)	22	8.5
Take care of others		
- Childcare(Bathing, grooming, carrying)	30	11.6
- Disabled care(Bathing, grooming, carrying)	2	0.8
Occupational activities*		
- Sitting, standing and selling the product (dessert, drink, groceries, food)	38	14.7
- Health care volunteer (walking on job)	22	8.5
- Gathering and selling stuff by pushing the wheelbarrow (old stuff, fruits, goods)	16	6.2
- Cutting leather	8	3.1
- Street vendor (garland, dessert, food)	7	2.7
- Weaving a garland	2	0.8
- Making brush	2	0.8
- Teaching	2	0.8
- Body massage	3	1.2
- Hair dressers	3	1.2
Recreations		
- Watching television	241	93.4
- Reading newspaper, religious book, novel book	115	44.6
- Listening to radio	68	26.4
- Sawing or doing crafts	18	7.0
- Attending sport events or movie	4	1.6
- Dancing	3	1.2
Religious Activity		
- Praying	114	44.2
- Islamic activity (stand up and sit down multiple times)	59	22.9
- Meditation	25	9.7
Exercise		
- Doing general conditioning exercise, such as moving arms and legs	149	57.8
- Walking leisurely for exercise or pleasure	137	53.1
- Walk fast or briskly	28	10.9
- Aerobic dance	24	9.3
- Doing Yoga	18	7.0
- Riding a bicycle	16	6.2
- Doing exercise with machine	12	4.7

Note * In some cases, one person has more than one job

Physical Activity Self-Efficacy

The scores of internal conditions and external conditions subscales ranged from 0 to 80 and 0 to 40, respectively. The subjects had low scores in both internal conditions (mean= 36.56, SD= 20.40) and external conditions (mean=14.94, SD=11.53). The total score of physical activity self-efficacy ranged from 0 to 120 (mean= 51.51, SD=29.86). Most subjects (45%) had a low self efficacy score while 41.5% and 13.6% had a moderate and a high self efficacy score, respectively. The skewness coefficient and the kurtosis value were negative and close to zero (-0.10 and -0.91) indicating a normal distribution.

The subjects had the highest confidence to perform physical activity/exercise even when they had to perform these activities alone (mean=7.95, SD=3.51) followed by when they had no equipment (mean=5.66, SD=4.65). Moreover, they had the lowest confidence to perform physical activity/exercise when they were tired (mean=2.07, SD=3.27) followed by when this activity is difficult (mean=2.39, SD=3.43) and when they feared of falling (mean=2.77, SD=3.74).

Furthermore, when comparing the mean score of physical activity self-efficacy between gender, the results showed no significant difference of mean scores between males (n=68) and females (n=190) ($t=0.06$, $p>.05$). Males had a mean score of 46.89 (SD=31.28) while females had a mean score of 46.66 (SD=29.11). When comparing the mean score of self efficacy among the age group, the results showed a significant different mean score among young old, moderate old and the oldest old group ($F=3.40$, $p<.05$) with mean scores of the young old group at 50.81(SD= 29.49), the moderate old group at 44.25 (SD=28.86), and the oldest group at 33.72 (SD=31.62).

Perceived Mental Health

The total score of perceived mental health ranged from 0 to 56 (mean=10.97, SD=11.27). The skewness coefficient and the kurtosis value were positive (1.58 and 2.28) indicating a non normal distribution. Furthermore, the results revealed that there was a significant difference of perceived mental health mean scores between males and females ($t=-2.98$, $p<.01$). Males had a mean score of 8.03 (SD=8.51), while females had a mean score of 12.06 (SD=12.05). In addition, the

more chronic diseases they had, the more they perceived poor mental health (F=3.47, p<.01), at which, the mean score of subjects who had no chronic diseases was 7.56, while that of those who had one to five chronic diseases were 8.78, 12.53, 13.35, 15.50 and 17.80, respectively. Interestingly when compare mean score of perceived mental health with mean score of perceived physical health, the result found that the more the subjects perceived poor mental health, the more they perceived poor physical health (F=44.07, p<.001). However, there was no association among young old, moderate old and the oldest old group with perceived mental health (F=2.33, p>.05).

Perceived Physical Health

The total score of perceived physical health ranged from 22.5 to 387.0 (mean=219.98, SD=81.57) at which 15.5% of subjects perceived poor health while 55 % and 29.5 % perceived moderate and good health, respectively. The skewness coefficient and the kurtosis value were negative closed to zero (-0.19 and -0.51) indicating a normal distribution. There was a significant difference of perceived physical health between males and females (t=2.03, p<.05). Males had a higher mean score than females did (237.10 vs. 213.85). Also, when comparing mean scores of perceived physical health with the age group, the results showed a significant difference of mean scores among the age group (F=3.75, p<.05). The young old aged had highest mean score at 233.22, while moderate old and the oldest old aged had a mean score at 209.96 and 190.82, respectively.

Social Support

The total score of friend support ranged from 11 to 31 (mean=13.99, SD=3.72), similarly family support ranged from 11 to 33 (mean=14.39, SD=4.34). The total score of these two types of support ranged from 22 to 64 (mean= 28.38, SD=7.05) which 88.4% of subjects perceived a low level of social support while 10.1 % and 1.6% perceived a moderate and a high level of social support, respectively. The skewness coefficient and the kurtosis value were positive (1.86 and 4.81) indicating a non normal distribution.

The subjects had highest support from family to perform physical activity/ exercise that was admiring them when they performed physical activity/exercise

(mean=1.69, SD=0.79) whereas, they had the lowest support in term of giving them money for performing exercise (mean=1.03, SD=0.22). Meanwhile, the subjects had the highest support from friends to perform physical activity/exercise by encouraging them to perform physical activity/exercise (mean=1.60, SD=0.81) while the lowest support was on giving them money for performing exercise (mean=1.15, SD=0.47). Furthermore, when comparing the mean scores of social support between sexes, the results showed no significant difference of mean scores between males and females ($t=-0.64$, $p>.05$). Also, there was no significant difference of social support mean scores among young old, moderate old and the oldest old group ($F=.26$, $p>.05$).

A Sense of Community

The total score of a sense of community ranged from 15 to 45 (mean=36.38, SD=6.72) of which 55% of the subjects perceived a high sense of community while 40.3% and 4.7% of subjects perceived moderate and low sense of community, respectively. The skewness coefficient and the kurtosis value were negative closed to zero (-0.81 and 0.11) indicating a normal distribution.

Furthermore, comparing the mean scores of a sense of community among districts was done, the results showed a significant difference in a sense of community among districts ($F=3.34$, $p<.01$). Subjects who lived in Khlong Toei, Watthana, Ratchathewi, Suanlaung, Bangkhae, and Don Mueang community had a mean score of a sense of community at 34.72, 38.25, 38.00, 37.44, 33.79, and 36.10 respectively. Subjects living in Watthana community reported the highest sense of community while Bangkhae reported the lowest one. The researcher also compared the means score of a sense of community among subjects with different years of living. The results showed a significant difference of a sense of community among years of living ($F=2.63$, $p<.05$). The subjects who lived in the community 1-10 years had the lowest mean score at 34.43 while those who lived in the community 61-70 years had the highest mean score at 39.86.

Neighborhood Environment and Facilities

Total score of neighborhood environment and facilities ranged from 9.17 to 20.83 (mean=14.39, SD=4.35), which 79.5% of the subjects perceived moderately

favorite in the neighborhood environment and facilities, whereas, 15.6% and 4.7% perceived low and high favorite, respectively. The skewness coefficient and the kurtosis value were close to zero (0.50 and -0.33) indicating a normal distribution. The results also showed that the subjects scored moderately on all dimensions of the subscales: service accessibility (mean=2.40, SD=0.71), street connectivity (mean= 2.12, SD=0.78), infrastructure for walking and cycling (mean=2.61, SD=0.54), traffic hazard (mean=2.12, SD=0.03) and crime (mean=2.01, SD=0.05) whereas, the score was low on the anesthetics subscale (mean=1.92, SD=0.71).

Furthermore, the results showed a significant difference of neighborhood environment and facilities scores among six districts ($F=14.64$, $p<.001$). Subjects who lived in the Khlong Toei, Watthana, Ratchathewi, Suanlaung, Bangkhae, and Don Mueang community had mean scores of neighborhood environment and facilities at 14.22, 14.94, 15.83, 13.90, 12.66, and 13.50, respectively. Subjects living in Ratchathewi community had the highest score while Bangkhae had the lowest score. All study variables are presented in Table 9.

Table 9: Descriptive Statistics of Independent and Dependent Variables (n=258)

Variable	Possible Range	Actual Range	Mean	Median	SD	Skewness (SE=.152)	Kurtosis (SE=.302)
Dependent Variable							
Physical Activity (MET-Hr/Wk)							
Total Score	0-highest as possible	1.25-216.75	81.38	78.13	38.64	0.49	0.43
Independent Variables							
Physical Activity Self- Efficacy							
Internal Condition	0-80	0-80	36.56	40.00	20.40	-0.24	-1.03
External Condition	0-40	0-40	14.94	15.00	11.53	0.21	-1.04
Total	0-120	0-120	51.51	55.00	29.86	-0.10	-0.91
Social Support							
Friend support	11-33	11-31	13.99	13.00	3.72	1.76	3.56
Family support	11-33	11-33	14.39	13.00	4.34	1.78	3.49
Total	22-66	22-64	28.38	26.50	7.05	1.86	4.81
Neighborhood Environments& Facilities							
Service Accessibility	1-4	1-4	2.40	2.50	0.71	-0.19	-0.58
Street Connectivity	1-4	1-4	2.12	2.33	0.78	0.03	-0.73
Infrastructure for walking & cycling	1-4	1.33-4	2.61	2.67	0.54	0.29	-0.53
Aesthetics	1-4	1.00-3.75	1.92	1.75	0.71	0.54	-0.62
Traffic Hazards	1-4	1.33-3.33	2.12	2.00	0.45	0.33	0.25
Crime	1-4	1.33-4.00	3.02	3.00	0.74	-0.20	-0.93
Total	6-24	9.17-20.83	14.39	13.83	4.35	0.50	-0.33
A Sense of Community	9-45	15-45	36.38	37.50	6.76	-0.81	0.11
Perceived Physical Health							
Physical Functioning	0-100	0-100	44.60	45.00	24.07	0.11	-0.69
Role Limitation	0-100	0-100	65.06	68.75	25.99	-0.42	-0.61
Bodily Pain	0-100	0-100	56.28	57.50	24.69	-0.05	-0.50
General Health	0-100	0-100	54.05	60.00	24.43	-0.48	-0.66
Total	0-400	22.5- 387.0	219.98	222.50	81.57	-0.19	-0.51
Perceived Mental Health	0-60	0-56	10.97	7.00	11.27	1.58	2.28

For the psychometric properties of the instruments, the results showed that the Cronbach's alpha coefficients of all instruments ranged from .78-.94, which were acceptable to very good (Table 10) while the two week test-retest reliability of the modified physical activity questionnaire for older Thai adults was equal to .98.

Table 10: Summarized Numbers and the Reliability Coefficients of Instruments (n=258)

	Number of Items	Corrected Items-Total Correlation	Alpha Coefficients
The Physical Activity Self-Efficacy Questionnaire	12	.87-.89	.89
The Social Support for Physical Activity Questionnaire	11	.89-.90	.90
The Neighborhood Environment Scale	22	.76-.79	.78
The Sense of Community Scale	9	.86-.89	.88
The Short Form-36 Health Survey (SF 36) (version2) (The Physical Composite Summary)	21	.93-.94	.94
The Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population	20	.92-.93	.93

Factors Influencing Physical Activity

In this study path analysis is used to answer research questions regarding the direct effect and indirect effect of independent variables to dependent variable.

Preliminary Analysis: Testing Assumptions

Because path analysis is based on simple regression technique that consists of a series of regression equations, therefore, the statistical assumptions related to multiple regression including normality, linearity, homoscedasticity and multicollinearity were tested before data analysis (Munro, 2001).

Normality

Normality refers to the shape of data distribution for a metric variable and its correspondence to the normal distribution. It is the most essential assumption in multivariate analysis (Hair et al., 2010; Tabachnick & Fidell, 1996). Two components

of normality are skewness and kurtosis. When a distribution obtains normal, the value of skewness and kurtosis are zero (Hair et al., 2010; Tabachnick & Fidell, 2007) also the values of skewness and kurtosis divided by its standard error (the Z- score) are in range of ±1.96 at a significant level of .05 or ±2.58 at a significant level of .01 (Hair et al., 2010). In this study, most study variables showed reasonably normal distribution because the values of skewness and kurtosis were close to zero and the Z-score were in range of ±2.58 except social support and perceived mental health (Table 11).

Table 11: Univariate Normality of the Study Variables (n=258)

Variables	Skewness (SE=.152)	Kurtosis (SE=.302)	Z- Score	
			Skewness	Kurtosis
Physical Activity	0.49	0.43	3.22	1.42
Physical Activity Self-Efficacy	-0.10	-0.91	-0.66	-3.01
Social Support	1.86	4.81	12.24	15.93
A Sense of Community	-0.81	0.11	5.33	0.36
Perceived Physical Health	-0.19	-0.51	-1.25	-1.69
Perceived Mental Health	1.58	2.28	10.39	7.55
Neighborhood Environment and Facilities	0.50	-0.33	3.29	-1.09

Generally those non-normal distribution variables should be transformed in order to achieve normality. However, according to Hair and others (2010), normality can have serious effects in small sample which are fewer than 50 cases, but the impact is effectively reduced when the sample size is equal to or more than 200. Also, their rule of thumb regarding transforming data; data transformation may change the interpretation of the variables. Using variables in their original (untransformed) format should be done when profiling or interpreting results (Hair et. al., 2010, p.79). Likewise, Munro (2001) suggested that multiple regression is somewhat robust to mild to moderate violations of normality, especially as the sample size increases. In this study, the sample size was 258 which is more than 200 and also most variables meet normality; therefore, the researcher still executed the original data without implementing any rectification.

Linearity

Linearity is referred to a straight line relationship between two variables representing the degree to which the change in the dependent variable is associated with the independent variables. Linearity can be examined from scatter plots of the independent variable with the dependent variable (Tabachnick & Fidell, 1996, 2007; Hair et al., 2010). In this study, the linearity between dependent and independent variables was found (Appendix G).

Homoscedasticity

Homoscedasticity refers to the assumption that dependent variable shows equal levels of variance across the range of the predictor variable(s) (Hair et al., 2010). To check the assumption, the residuals can be plotted against the predicted values and against the independent variables. The dependent variables show equal levels of variance across the range of the predictor variables when the data form a straight line from the lower – left corner to the upper-right corner (Munro, 2001). In this study, even though the actual data scores vary around the prediction line, in general they cluster fairly close to the line. Therefore it can be assumed that homoscedasticity was found (Appendix G).

Multicollinearity

According to Hair and others (2010), multicollinearity refers to the extent to which a variable can be explained by other variables in the analysis. If multicollinearity increases, the ability to define any variable's effect is reduced. Multicollinearity complicates the variable interpretation because it is more difficult to determine the effect of any single variable due to their interrelationship. It can be detected by employing correlation and multiple regression. Pearson's correlation coefficients is higher than .85 indicated a high correlation between variables or had multicollinearity (Munro, 2001). Multiple regression was used to calculate tolerance and Variance Inflation Factor (VIF). Tolerance value ranged from 0 to 1. If the tolerance value was low and VIF was higher than 10, it was indicated multicollinearity (Munro, 2001).

As shown in Table 12 and Table 13 the correlation coefficients are between -.60 and .63 indicating no multicollinearity. Also, the tolerance values ranged from 0.47 to 0.83 and VIF values was less than 10, thus multicollinearity was not reported.

Table12: Pearson Product Moment Correlations among the Study Variables (n=258)

	SenseCom	Self Effi	Support	Neighbor	Depress	Perceived
SenseCom	1.0					
Self Effi	.38**	1.0				
Support	.34**	.18**	1.0			
Neighbor	.28**	.31**	.32**	1.0		
PerceiveMen	-.33**	-.59**	-.11	-.08	1.0	
PerceivePhy	.30**	.63**	.08	.14*	-.60**	1.0
TPA	.39**	.49**	.22**	.18**	-.25**	.38**

Note * p<.01, ** p<.05

SenseCom= A Sense of Community

SelfEffi= Physical Activity Self-Efficacy

Support= Social Support

Neighbor= Neighborhood environment and facilities

PerceiveMen= Perceived Mental Health

PerceivePhy=Perceived Physical Health

TPA=Total Physical Activity

Table 13: Multicollinearity among Independent Variables (n=258)

Variable	**Tolerance Value**	**Variance Inflation Factor**
Physical Activity Self-Efficacy	0.47	2.11
Social Support	0.83	1.21
Perceived Mental Health	0.55	1.83
A Sense of Community	0.74	1.34
Perceived Physical Health	0.52	1.92
Neighborhood Environment and Facilities	0.81	1.24

Model Identification

Path analysis was used to answer the research questions regarding the direct and indirect effects between the set of independent variables and dependent variable. According to the recommendation of Nunnally and Bernstein's (1994) regarding sample size calculation, 30 subjects per independent variable is needed in the model in order to increase the likelihood that findings can be replicated and are not mere artifact (Munro, 2001). In this study there were 6 independent variables, therefore, at least 180 subjects were needed. This showed that the subjects in this study, which were 258, are appropriate for path analysis approach.

Conducting path analysis involves preparation, analysis and a consideration of the analysis limitation (Munro, 2001). For the preparation step, multiple regression with enter method was done for exploring the factors influencing physical activity including physical activity self efficacy, a sense of community, social support, neighborhood environment and facilities, perceived mental health and perceived physical health. The analysis showed that physical activity self efficacy, a sense of community, perceived mental health and perceived physical health had a significant direct effect to physical activity while social support and neighborhood environment and facilities had no significant direct effect to physical activity (Table 14). Therefore, path analysis executed by the LISREL was done to explore the indirect effects.

Table 14: Regression Analysis for Physical Activity (n=258)

Independent Variables	B	SE	Beta	t-value	p
Constant	-14.11	17.59		-0.80	0.423
Physical Activity Self Efficacy	0.51	0.10	0.39	5.14	0.000
A Sense of Community	1.20	0.34	0.22	3.59	0.000
Social Support	0.50	0.32	0.09	1.59	0.113
Neighborhood Environment & Facilities	-0.72	1.05	-0.04	-0.68	0.496
Perceived Mental Health	0.51	0.24	0.15	2.12	0.035
Perceived Physical Health	0.07	0.03	0.16	2.16	0.032
R	0.56				
R^2	0.31				
Adjusted R^2	0.29				
R^2 Change	0.31				
F	19.46				
df	6				
p	.000				

Principal Analysis

The Structural Model Testing

Path analysis was executed through LISREL 8.52 for testing the hypothesized model. According to Hair and others (2010) the overall model fit indexes composed of: 1) the likelihood ratio chi-square (X^2); 2) the relative or norm chi-square (X^2/df); 3) the goodness of fit index (GIF); 4) adjusted goodness of fit index (AGIF); and 5) the root mean square error of approximation (RMSEA). The overall model fit when the test indicated: 1) non significant chi-square; 2) the relative or norm chi-square (X^2/df) less than 2; 3) GIF and AGIF values greater than 0.9; and 4) RMSEA values less than 0.05 (Hair et al., 2010).

The hypothesized model consisted of seven variables including physical activity, physical activity self-efficacy, perceived mental health, perceived physical health, social support, a sense of community, neighborhood environment and facilities was tested.

Hypothesized Model

In this study, the researcher specified the model with four exogenous observable variables and three endogenous observable variables. The researcher also fixed the matrix specification followed by the default of the program. The maximum likelihood (ML) method of parameter estimation was employed. The results showed that most paths in the hypothesized model were significant with the proposed direction. However, paths between 1) social support and physical activity, 2) social support and physical activity self-efficacy, and 3) neighborhood environment and facilities and physical activity were not significant. Also, even though the path of perceived mental health and physical activity was significant, it had an opposite direction as proposed in the model as shown in Figure 4.

Furthermore, the results showed that the model did not fit the data which X^2 = 28.95, df = 8, X^2/ df = 3.62, p=.00032, RMSEA= 0.102, GFI= .97, AGFI= .89. The smallest and largest standardized residuals ranged from -4.619 to 4.660. Consequently, the hypothesized model was modified using the modification indices of the program and theoretical support.

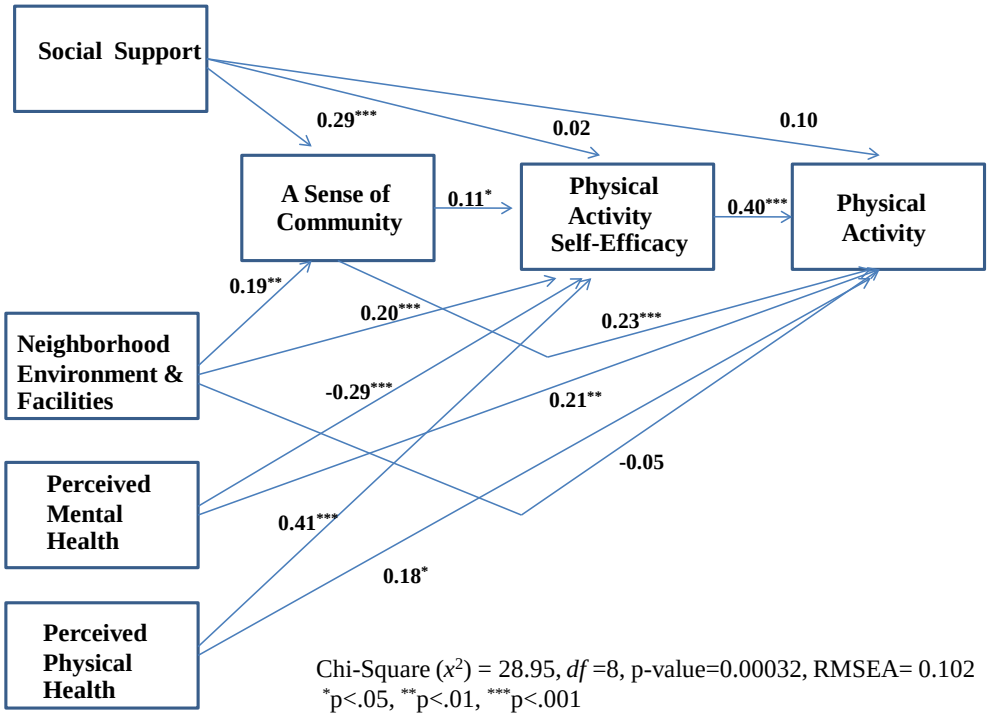

Figure 4: A Hypothesized Model of Physical Activity for Older Thai Adults Living in Urban Poor Communities

Modification Model

The hypothesized model did not fit the data, the researcher modified the model following the modification indices of the LISREL program. However, according to the literature, it made theoretical sense to add the path between perceived physical health and a sense of community in that older adults who reported perceived physical health well being would report a greater sense of community (β=0.26, p<.001).

Consequently, this path was drawn, finally the model fit nicely with the data at X^2 = 9.64, *df* 7, X^2/ *df* = 1.38, *p*=0.210, RMSEA= 0.039, GFI= .99, AGFI=0.96. The smallest and largest standardized residuals ranged from -2.504 to 1.350. Therefore, the modified model was accepted (Figure 5). The comparison of goodness of fit indices between the hypothesized model and the modified model was also shown in Table 15 and the Comparison of Path Coefficients, Standard Errors, T-values of parameter estimates and the total effect between the Hypothesized model and the Modified Model also shown in Table 16 and Table 17.

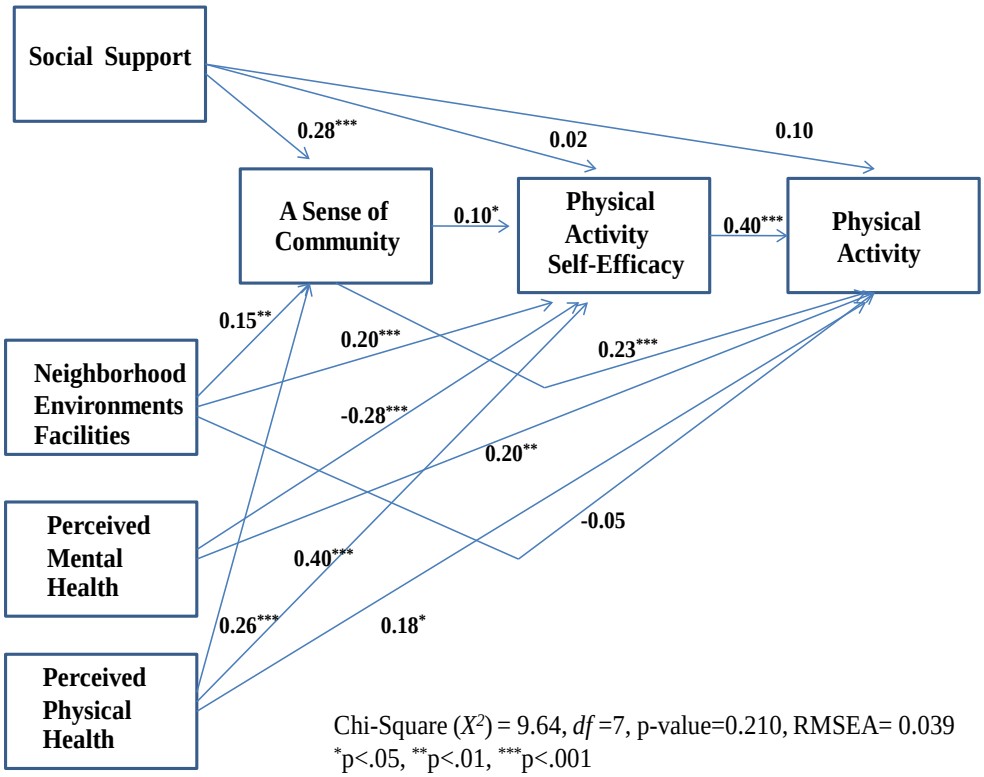

Figure 5: A Modified Model of Physical Activity for Older Thai Adults Living in Urban Poor Communities

Table 15: The Comparison of Goodness of Fit Indices between the Hypothesized Model and the Modified Model

Structural Model	X^2	df	X^2/df	p-value	GFI	AGFI	RMSEA	Largest Standardize Residual
Hypothesized Model	28.95	8	3.62	.00032	0.97	0.89	0.102	4.660
Modified Model	9.64	7	1.38	0.210	0.98	0.96	0.039	1.350

Table 16: The Comparison of Path Coefficients, Standard Errors, T-values of Parameter Estimates between the Hypothesized Model and the Modified Model

Path Diagram	The Hypothesized Model			The Modified Model		
	Path Coefficients	SE	t-value	Path Coefficients	SE	t-value
BETA						
Sensecom -Self Efficacy	0.11	0.20	2.17*	0.10	0.21	2.08*
Sensecom- Physical Activity	0.23	0.31	3.99***	0.23	0.33	3.83***
Self Efficacy - Physical Activity	0.40	0.10	5.43***	0.40	0.10	5.43***
GAMMA						
Social Support- Sensecom	0.29	0.06	4.66***	0.28	0.06	4.68***
Social Support- Self Efficacy	0.02	0.21	0.32	0.02	0.21	0.32
Social Support- Physical Activity	0.10	0.31	1.71	0.10	0.31	1.71
Neighborhood- Sensecom	0.19	0.20	3.08**	0.15	0.19	2.61**
Neighborhood-Self Efficacy	0.20	0.66	4.22***	0.20	0.66	4.24***
Neighborhood-Physical Activity	-0.05	1.04	-0.88	-0.05	1.04	-0.89
PerceiveMen- Self Efficacy	-0.28	0.14	-5.09***	-0.28	0.14	-5.09***
PerceiveMen-Physical Activity	0.21	0.23	2.99**	0.20	0.23	2.99**
PerceivePhy-Self Efficacy	0.41	0.02	7.31***	0.40	0.02	7.12***
PerceivePhy-Physical Activity	0.18	0.03	2.49*	0.18	0.04	2.44*

Note *P<.05, **p<.01, ***p<.001

Sensecom= A Sense of Community

Neighborhood= Neighborhood Environment and Facilities

PerceivePhy= Perceived Physical Health

PerceiveMen=Perceived Mental Health

Self Efficacy= Physical Activity Self-Efficacy

Table 17: The Comparison of Predictive Factors Effects between the Hypothesized Model and the Modified Model

Affected Variables / Causal Variables	The Hypothesized Model			The Modified Model		
	DE	**IE**	**TE**	**DE**	**IE**	**TE**
Sensecom → Self Efficacy	0.10*	-	0.10*	0.10*	-	0.10*
Sensecom → Physical Activity	0.23***	0.04***	0.27***	0.23***	0.04***	0.27***
Self Efficacy → Physical Activity	0.40***	-	0.40***	0.40***	-	0.40***
Support → Sensecom	0.29***	-	0.29***	0.28***	-	0.28***
Support → Self Efficacy	0.02	0.03	0.05	0.02	0.03	0.05
Support → Physical Activity	0.10	0.08	0.18	0.10	0.08	0.18
Neighborhood → Sensecom	0.19**	-	0.19**	0.15**	-	0.15**
Neighborhood → Self Efficacy	0.20***	0.02***	0.22***	0.20***	0.02***	0.22***
Neighborhood → Physical Activity	-0.05	0.13	0.08	-0.05	0.12	0.07
PerceiveMen → Self Efficacy	-0.29***	-	-0.29***	-0.28***	-	-0.28***
PerceiveMen → Physical Activity	0.21***	-0.12***	0.09***	0.20***	-0.11***	0.09***
PerceivePhy → Self Efficacy	0.41***	-	0.41***	0.40***	0.03***	0.43***
PerceivePhy → Physical Activity	0.18*	0.17*	0.35*	0.18*	0.23*	0.41*

Note *p<.05, **p<.01, ***p<.001

Sensecom= A Sense of Community

Self Efficacy= Physical Activity Self-Efficacy

Neighborhood= Neighborhood Environment and Facilities

PerceivePhy= Perceived Physical Health

PerceiveMen= Perceived Mental Health

DE=Direct Effect

IE=Indirect Effect

TE=Total Effect

Hypothesis Testing Results

Hypothesis I: Physical activity self-efficacy has a positive direct effect on physical activity.

The finding supported that physical activity self-efficacy has a significant positive direct effect on physical activity (β=0.40, p<.001).

Hypothesis II Social support has a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy and a sense of community.

This finding partially supported that social support has a significant positive indirect effect on physical activity through a sense of community (β=0.28, $p<.001$) but a positive direct effect on physical activity (β=0.10, $p>.05$) and a positive indirect effect through physical activity self-efficacy were not significant (β=0.01, $p>.05$).

Hypothesis III: A sense of community has a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy.

This finding supported that a sense of community has a significant positive direct effect on physical activity (β=0.23, $p<.001$) and a significant positive indirect effect on physical activity through physical activity self-efficacy (β=0.10, $p<.05$).

Hypothesis IV: Neighborhood environment and facilities have a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy and a sense of community.

This finding mostly supported this hypothesis in that neighborhood environment and facilities have a significant positive indirect effect on physical activity through a sense of community (β=0.15, $p<.01$) and physical activity self-efficacy (β=0.20, $p<.001$) but a positive direct effect on physical activity was not significant (β=-0.05, $p>.05$).

Hypothesis V: Perceived physical health has a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy.

This finding supported that perceived physical health has a significant positive direct effect on physical activity (β=0.18, $p<.05$) and a significant positive indirect effect on physical activity through physical activity self-efficacy (β=0.40, $p<.001$).

Hypothesis VI: Perceived mental health has a negative direct effect on physical activity and a negative indirect effect on physical activity through physical activity self-efficacy.

This finding found that perceived mental health has a significant positive direct effect on physical activity (β=0.20, $p<.001$) and a significant negative indirect effect on physical activity through physical activity self-efficacy (β=-0.28, $p<.001$). Thus, this hypothesis was partially supported in the path of perceived mental health and physical activity self-efficacy.

Furthermore, the researcher created a new path of the relationship between perceived physical health and a sense of community in the model according to the modification indices of LISREL program also supporting the theory. Perceived physical health has a positive direct effect to a sense of community (β=0.26, $p<.001$). The greater perceived physical health well being the greater perceived a sense of community. Finally, the final model explained 33% of the variance in physical activity, 51 % of the variance in physical activity self efficacy and 22 % of the variance in a sense of community.

Summary

This chapter illustrated the characteristics of the samples and the independent variables influencing physical activity. The proposed models and hypotheses testing using the SPSS 17.0 and LISREL 8.52 program were also illustrated. The results from the LISREL program found that the final model of physical activity in older Thai adults living in urban poor communities showed an overall good fit with the empirical data.

CHAPTER V
DISCUSSION

This chapter is organized into three sections. The first section discusses the characteristics of the samples and the independent variables influencing physical activity. The second section discusses the proposed models and the hypotheses. The last session discusses the limitations and strengths of this study.

Discussion of Characteristics of the Sample and Independent Variables

Characteristics of the Sample

The results revealed that most of the sample (73.6 %) were female aged between 60 to 88 years (mean=69.85) and around half of them were young old aged 60-69 years. This finding is consistent with the survey of the Thai National Statistic Office (2007) that the number of older adults in Bangkok was approximately 647,366 persons, (9.4% of other aged group) of which, 57.8% are females and 42.2% are males. The number of females is more than males. This may be due to the life expectancies of females are longer than males (75.55 vs. 70.77) (Central Intelligence Agency, 2009). In this study around half (47.3 %) were married and 39.9% were widowed the remaining 2.7% were single. This finding supported the study of Asawachaisuwikrom (2001), Chinuntuya (2001), Knodel and Chayovan (2009), Taweeluk (1999), Visuthipanich (2009) and the survey of the National Statistic Office (2007) that the majority of older Thai persons were married or widowed and very few had never married. As foreseen, the number of widowed older adults increases with aging.

In regards to education, unsurprisingly, most older adults (76.0%) finished primary school while 9.3% had no education. This study further investigated and found that because the poverty they were also a huge strain on their family's finances, it would be very hard for their parents to send them to school. Therefore in childhood

period they may help their family generate income. The majority of them (71.7%) did not work, however 28.3 % are still working. The reason why most older adults did not work might be from the deteriorations and the chronic diseases they had. The works done in this group were vendors, labors, barbers, general employees, health care volunteers and so on. In this study, older adults performed volunteer activities such as health care volunteers in order to gain some monthly income (600 Baht per month). The reasons given why some older adults still worked are included 1) lack of support from family, 2) decreasing family's dependency, 3) contributing to the family's business, and 4) having social contact with others. These results support the studies of Chinuntuya (2001), Poolsawat (2007) and National Statistic Office (2007) that most older adults did not work however 25.7%, 33% and 28.7% still working in order to generate income.

Regarding income, around half (44.9%) received income from their families while some (28.3%) earned income from their employment. Only 25.3% reported they have no income. Consistent with the older adults survey (National Statistic Office, 2007) in the year 2007, the main income of older people comes from their children (52.3%) followed by employment (28.9%). The average older adults' monthly income equal to 1,317.83 Baht which was lower than the 2007 poverty line for Thai people (1,443 Baht) (National Statistical Office, 2007). This supports the study of Lioyd-Sherlock (2006) that assessed the economic well being of older people living in urban poor and rural poor communities in Thailand. The results revealed that 11% of these groups lived below the poverty line. Also, around half of them did not have enough money to meet their needs (Lioyd-Sherlock, 2006). To this point, it can be assumed that these urban poor older adults might suffer from an inadequate income too.

For their health status, since the nature of disadvantaged environment combined with the low level of education and low income of the residents results in low health literacy, not surprisingly, in this study most older adults reported that they had at least one chronic disease (82.3%). In regards to the persons whom older adults live with, half of them (50%) lived with their offspring and grandchildren while only 6.6% lived alone. This corresponds with the study of Chinuntuya (2001), Poolsawat (2007) and National Statistic Office (2007) that most older adults lived with either their offspring and grandchildren or their spouse and offspring. This may be due to Thais believe that caring for a parent is an opportunity to repay (Hengudomsub, 2005).

Characteristics of Independent Variables

Physical Activity

In the present study, mean total physical activity score (MET-Hours/Wk) declined with age. Young old age had the highest mean score (141.89), follow by moderate old (103.89) and the oldest old (73.53). The reason might be from most older adults (83.3%) have at least one chronic disease. Some of these diseases may limit older adults' physical activity, especially in advanced age. A decline in health and an increase in frailty lead to difficulty with physical movement (Kespichayawattana & Jitapunkul, 2009). Older adults who had more chronic conditions, health problems or disabilities are more likely to be inactive than their counterparts (Booth, Bauman, & Owen, 2002; Dawson et al., 2007; Lees et al., 2005; Rasinaho et al., 2006; Shephard, 2002). Furthermore this study found that around 30% of subjects were overweight and 16.7% were obese. This could be explained that these older adults might perform sedentary behaviors.

Comparing the mean total physical activity score with the Visuthipanich study (2009), this scale was tested in 550 older Thai adults living in a community in Bangkok. The results showed that subjects in the current study had lower average score than the Visuthipanich study with scores of young old, moderate old and the oldest old age were 293.70, 163.21 and 85.83, respectively. One can assume that older persons living in urban poor communities tend to be more sedentary than lay older persons. Western studies support this conclusion, that older adults living in poor areas are more likely to be sedentary than those living in opposite conditions (Kamphuis et al., 2007; Koster et al., 2006; Taylor et al., 1998). Important barriers to physical activity performance may be due to living in dilapidated and unsafe environment (Koster et al., 2006; Taylor et al., 1998), the perception of a low quality of available exercise facilities together with the inability to pay facility fees (Bennett et al., 2007; Harrison et al., 2007; Romero, 2005; Wilbur et al., 2003), and so on.

Furthermore, the results showed that females performed more household, occupation, and recreation than males whereas males performed more exercise and transportation than females. These may be due to female had higher responsibility for family work more than males. This is consistent with the studies of Asawachaisuwikrom

(2001), Inpang (2000), and Taweeluk (1999) that male older adults performed exercises higher than females, while females performed more household activities than males.

Regarding exercise behavior, even though most older adults (73.6%) reported they performed exercise, only 20.2% meet the goal of the Thai national health policy (2001) that aimed to promote people to perform 30 minutes of moderate intensity of physical activity for 5 days per week or 20 minutes of vigorous intensity 3 days per week. Some of exercise barriers are poor health from chronic diseases or disability, the family responsibility, no time, no friends, and few exercise facilities. Consistent with the results, older Thai adults performed exercise at low levels and did not meet the goal of the national health policy (2001) (Asawachaisuwikrom, 2001; Chinuntuya, 2001; Jitramontree, 2003; Poolsawat, 2007). Furthermore, based on the Thai National Statistical Office (2005) and (2007) survey of exercise performance, the number of older adults who performed exercise was less than those who did not exercise, at 21.27% versus 78.73% and at 41.4% versus 58.6%, respectively.

Moreover, this study revealed that most exercisers engaged in light intensity exercise, which, the most two common light intensity forms of exercise were doing general conditioning exercise, such as moving arms and legs (57.8%) and walking leisurely for exercise or pleasure (53.1%). Furthermore the percentage of exercisers decline with age. The reason might come from the deterioration of the musculoskeletal system which leads to decreasing power and strength due to advanced age (Gee, 2005). This is consistent with the survey conducted by National Statistical Office, Thailand (2007) that young old exercised more than moderate old and the oldest old aged at 46.8 %, 36 %, and 22.7 %, respectively.

Physical Activity Self-Efficacy

The results showed that most subjects (45%) had a low level of physical activity self-efficacy. Furthermore, this result showed a difference among young old, moderate old and the oldest old group, which, young old had the highest score followed by moderate old and the oldest old.

Possible reasons might be many physical capacities, such as, muscle mass and muscular strength decrease as people grow older (Graves et al., 1994), also, a decrease in control belief regarding mobility and functional performance associated

with advanced age (Bandura, 2001). Furthermore, older adults' behaviors are influenced by psycho socio cultural constrains and repetitious environments which may decrease the quality of function and intellectual abilities, therefore, older adults may rarely exploit their full function.

From literature review, there are many factors affecting physical activity self-efficacy such as the physical and mental health status (Conn et al., 2003), social support and environmental variables, such as, an access to safe exercise facilities (Bandura, 1997). In this study, poor older persons living in difficult circumstances may suffer from chronic diseases, a lack of social support and a lack of exercise facilities therefore most subjects might have a low level of confidence in their ability to perform physical activity when faced with barriers.

Social Support

The results showed that most subjects (88.4%) perceived a low level of social support both from family and friends. Furthermore, there was no significant difference of social support mean scores between sex and among young old, moderate old and the oldest old aged. In comparison, the previous study conducted by Chinuntuya (2001) who translated and modified the social support scale from the original version (Pender, 1996), the social support mean score of this study (mean=28.38) was lower than her study (social support mean score for leisure time exercise and life style exercise = 43.74 and 38.88).

Possible reasons might be, even though Thais believe that caring for a parent is an opportunity to repay (Hengudomsub, 2005), urban poor children struggling with poverty might not recognize the lack of parent physical activity. They might have a limited time to give their parents emotional and information support and/or not have enough money to give them as tangible support. The subjects who perceived a low level of friend support might come from the number of older adult's family and friend's death or lack of friends. Also, some older adults stayed at home alone and did not perform activity with others. These are some reasons why most subjects may perceive a low level of family and friend support.

A Sense of Community

The results showed that more than half of subjects (55%) perceived a high sense of community. This finding supports the study of Bhattacharya (2006) that a sense of community was found in a group of 300 adult slum residents. Even though they lived in an overcrowded and deteriorating environment, they maintained good and healthy relationships among each other and they were satisfied with their social relationship. This also showed no difference of a sense of community between male and female. It supports the report from the Health Statistics Division of Canada (2005) that the proportion of males and females who reported a strong sense of community belonging did not differ. Significant differences occurred among the subject's years of living in a community. Subjects who lived in communities more than 10 years had a higher sense of community score than those who lived in the community 1-10 years. This supports the study of Wilkinson (2008) that birthplace and years lived in the community significantly positively influenced psychological sense of community. The reason may be years lived in the community generally increases interaction and an individuals' social cohesion.

Furthermore, the results showed a significant difference of scores among districts. Subjects living in the Sulaobandon community, Watthana district reported the highest sense of community followed by the Suan- ngern community, Ratchathewi district and the Unaietichom community, Suan luang district, while those living in Ruamjai rimkhlong Mu3, Bangkhae district reported the lowest sense of community. Two communities, Sulaobandon and Unaietichom are Islamic communities where members have the same patterns of thought "believe in one God-ALLAH", have the same values, behaviors and religious practices. Religious traditions are highly valuable in the formation of guidelines for living (Sala, 2008), therefore, members will share an emotional connection, feel part of the community, integration and will influence each other.

For Suan- ngern community, even though this community is a Buddhist community, which has no strict religious practices, a strong connection among community members can be developed. Since this community is located near Ramathibodi hospital and Phamongkutkao hospital, this community was selected as the study center for many health care professional students. Many activities such as:

exercise programs, health care prevention programs, and elderly clubs were established in this community by joining hands between community members and health care professionals. Every day at the park, in the evening, older adults and other members will exercise together. Community members can share an emotional connection, feelings of being part of community, integration and influence each other. On the opposite way, a community which is separated from each other and having no activity together, a sense of community, will be less developed. In this sense, this can be assumed that a sense of community can be developed through the religious phenomenon and performing activities together.

Perceived Mental Health

Even though perceived mental health was measured by the Health Related Self Reported (HRSR) Scale: The Diagnostic Screening Test for Depression in Thai Population (Kasantikul et al., 1997), this current study did not use the cut-off score to detect depression but use the total score to indicate perceived mental health. The higher score, the more they perceived poor mental health. The results showed that the perceived mental health mean score equals to 10.97 while the maximum score equals to 56 (The possible score ranged from 0-60). Since perceived poor mental health especially depression may occur in older adults particular those who are poor, with low social support and have disabilities and/or chronic diseases (Kostera et al., 2006), therefore in order to discuss better about perceived mental health, the researcher explored in detail of its' score.

According to the score interpreting, the score at 30 was used to detect major depression while score of equal to or more than 25 referred to depression. This result found that the percentage of older adults who perceived a mental health problem was 12.4% (n=32) comprising 10.9% of depression (n=28) and 1.5% of major depression (n=4). As expected, the percentage of females who perceived poor mental health was higher than males (2.5: 1). This result supports the study of Wangtongkum and others (2008) that females were more depressed than males (1.45:1). Because females have a life expectancy higher than males, thus they can be expected to experience a longer period of chronic diseases and disability also they could experience loneliness from widowhood especially in cases that have no caregivers

(Kespichayawattana & Jitapunkul, 2009). Furthermore, females may play multiple roles at the same time. They must balance their own needs with their family needs including economic, emotional and health, thus, it is inevitable that they may suffer from distress (Chan & Zeng, 2009) and perceived poor mental health.

Furthermore, this result supports the study of Wangtongkum and team (2009) that the prevalence of mental health problem especially depression increased with age. Advanced age is associated with an increase in disability and chronic diseases, a decrease in social and cognitive functioning, having financial problems and encounter with deaths. All of these were linked to an increased risk of depression (Norman & Redfern, 1997; Wangtongkum, et al., 2009; Wilcox & King, 2004). Moreover, this present study found that the more older adults perceived poor physical health and the more chronic disease they had, the more they perceived poor mental health. This result supports the study of Turvey and others (2009) that chronic illness and physical function predicted depression in older adults.

Perceived Physical Health

The results showed that the percentage of subjects who perceived poor health was 15.5% while 55% and 29.5 % perceived moderate health and good health. Since urban poor older adults have a low literacy and low income combined with living in poor environment conditions and poor sanitation, therefore poor people may expose to high-risk environments and influence risky behavior also may have higher rate of chronic diseases and premature death (Abercrombie et al, 2008; Fuller et al., 1993; Kittipimpanon, 2006; Piaseu & Mitchell, 2004; WHO, 2005, 2008). In addition to these disadvantages, social class creates barriers to their health and an increased vulnerability to this group as well. Therefore, they might perceive themselves in poor physical health, especially, in cases that have chronic diseases and disability.

The results are consistent with the study of Chen, Chang and Yang (2008), Hou and Myles (2004) and Kespichayawattana and Jitapunkul (2009) that perceived physical health had a significant difference between males and females, of which, females were more likely to report their health as poorer than males did. Also, Kespichayawattana and Jitapunkul (2009) found that there were differences of perceived physical health among age groups, in that young older adults reported their

health as good and very good more than the moderate old and the oldest old group. Like the reasons stated above, the older, the more chronic disease and disability. Thus, moderate old and the oldest old age might perceive lower physical health than young old age. Furthermore, females live longer with chronic diseases and disability hence they might perceive poorer health than males do.

Neighborhood Environment and Facilities

According to the score interpreting for all subscales, higher score referred to a more favorable value of the neighborhood environment and facilities or higher physical activity performing. Surprisingly, this result indicated that 79.5% of the subjects perceived moderately favorable in their neighborhood environment and facilities. Considering the detail of all subscale dimensions, the subjects perceived moderately favorable in all subscales, except, the anesthetics subscale. Furthermore, the results showed that the neighborhood environment and facilities score showed a significant difference among districts and the correlation between a sense of community and perceived neighborhood environment and facilities was .32.

Possible reasons that might affect the level of older adults' neighborhood environment and facilities perception might be that more than 80% of the sample lived in their community more than 10 years. They might be acquainted and adapted to their living environment also some might have developed a sense of community with their neighbors. Furthermore, in some districts such as Khlong Toei district and Ratchathewi district, community leaders and community dwellers formed their own groups or coordinated with non government and/ or government organizations in order to solve many problems, not only the basic need problems, but also, the environmental problems, including the threat of physical deterioration, poor sanitation, inadequate street light, garbage disposal and so on. They also arranged settings such as parks, spaces in front of their building or under building as places to perform many activities. Some exercise facilities were created by dwellers and some were sponsored by outsiders.

This is in contrast with the study of Bhattacharya (2006) that a group of 300 adult slum inhabitants had an unfavorable perception of their environment. The reasons of unfavorable perception were mainly due to lack of living space, lack of

children's play area, overcrowded, inadequate light and ventilation, poor drainage system, loud noise and disturbances in and around the house.

Discussion of Factors Influencing Physical Activity

According to Cohen (1988) regarding the interpretation of the absolute magnitudes of path coefficients, the standardized path coefficients with absolute values less than 0.10 indicated a small effect, while values around 0.30 and values ≥0.50 indicated a medium effect and a large effect, respectively. In this study, the effects of the major variables in the model were considered as small to medium effect. Moreover, this model explained 33% of physical activity, 51% of self efficacy and 22% of a sense of community. The discussion regarding the relationships among studied variables is discussed below.

Hypotheses Testing

Hypothesis I

As expected physical activity self efficacy had a significant positive medium direct effect on physical activity (β=0.40, $p<.001$). Also, it was the most powerful predictor in explaining physical activity performance in older Thai adults living in urban poor communities. Thus, this hypothesis is supported.

Physical activity self-efficacy is a crucial determinant of the older adult's physical activity because older adults need to believe in their own abilities and that they can perform physical activity regularly if they want to be a physically active person (Bandura, 1997). In this study, around half of the subjects were young old aged 60-69 years, could live independently and do daily activities by themselves, hence, these abilities in turn increased their beliefs in their own abilities to overcome physical activity barriers and drive physical activity performance.

This finding supports that physical activity self-efficacy as the best predictor and most consistent association for physical activity in older adults. In this study self efficacy was shown as the most powerful predictor of physical activity. Furthermore, self-efficacy acts as a mediator of physical activity. Measuring change in self efficacy is essential to determine if this change actually results from the intervention and in turn influences a change in physical activity.

This finding is also consistent with most previous Western and Thai studies that self efficacy has a significant positive medium to high direct effect on older adults' physical activity (Brassington et al., 2002; Chinuntuya, 2001; Duncan & Mummery, 2005; Jitramontree, 2003; McAuley et al., 2003; Poolsawat, 2007; Resnick et al., 2000; Umstattd & Jeffrey, 2007). Only a few studies do not support the relationship (Taweeluk, 1999) or few studies show a low relationship between these two variables (Anderson et al., 2006; Asawachaisuwikrom, 2001; Resnick, 2001).

In conclusion, the more older adults living in urban poor communities perceived a higher physical activity self-efficacy, the more they performed physical activity. Therefore, physical activity self-efficacy should be promoted in urban poor older adults in cases who perceived a low self efficacy in order to promote physical activity performance.

Hypothesis II

This finding partially supports this hypothesis in that social support has a positive significant indirect effect to physical activity through a sense of community ($\beta=0.28$, $p<.001$), but a positive direct effect on physical activity and a positive indirect effect to physical activity through physical activity self-efficacy were not found ($\beta=0.10$, $p>.05$; $\beta=0.01$, $p>.05$).

For the direct effect, according to Pender (1996), social support is one component of an interpersonal influence, a cognition focused on the behaviors, beliefs or attitudes of other individuals with direct and indirect influences on health and health behaviors. Therefore, this finding was not supported the HPM and prior studies. For example, the study of Duncan and Mummery (2005) found that persons reporting high levels of social support were more likely to participate in recreational walking than those who reported the opposite, while the study of McAuley and others (2003) found that the social network and support created within the exercise group were often considered an important factor of older adults' exercise behavior.

The results are also inconsistent with the study of Plonczynski and others (2008) in which social support had a positive direct effect to rural female older adults' household physical activity and Resnick and others (2002) study in which a significant difference in friend social support scores was found between older adults who

exercised regularly and those who did not. Furthermore, Chinuntuya (2001) found that social support was a significant predictor of leisure time exercise and lifestyle exercise in a sample of 300 older Thai adults living in Bangkok. However, this current finding was consistent with Asawachaisuwikrom's (2001) study that social support was not a significant predictor of physical activity in older Thai adults.

This finding did not support the indirect effect of social support on physical activity through physical activity self-efficacy. There are several possible reasons to explain this finding. First, the subjects were a homogenous group, in which, they perceived a low level of social support both from family and friends. Second, as previous discussed due to struggles with poverty, urban poor adult children might have limited time to be concerned about their parent's physical activity, also they might not have enough money for support. Also, the number of older adults close friends was decreasing. Thus, some older adults stayed at home and did not perform activity with others. Third, in previous studies there were different variables in the model compared with this present study. This finding was inconsistent with the studies of Anderson and others (2006), McAuley and others (2003), and Resnick and others (2002) that found social support had an indirect effect on physical activity through self-efficacy.

For the indirect effect of social support on physical activity through a sense of community, this finding supports the SEM and some studies that proposed there is an interaction within and across differing levels of environment and gatherings of people. Even though no studies exist about these relationships in older adults, Vieno and others (2007) and Wentzel (1998) found that family support was strongly related to a sense of community in school. This current finding found that social support had a positive significant indirect effect to physical activity through a sense of community. The possible reason might be from a sense of community may be strengthened by actual or perceived experiences of social support.

Hypothesis III

As expected, a sense of community has a significant positive direct effect on physical activity ($\beta=0.23$, $p<.001$) and a significant positive indirect effect through physical activity self-efficacy ($\beta=0.10$, $p<.05$). This means, those who perceived a greater sense of community perceived higher physical activity self-efficacy which

links to a physically active lifestyle. Likewise, perceived greater sense of community itself links to performing physical activity. This study underpinning the HPM and the SEM supported the interplay of individual behaviors with social cultural environment. Thus, this hypothesis is supported.

For the direct effect of a sense of community to physical activity, this finding showed the same results as previous studies that a sense of community had a relationship with physical activity. Fallen and others (2005) and Young and others (2004) found the relationship between a better sense of community and being physically active in community residents whose aged 18-60 years and in women whose aged 73-78 years. Furthermore, this finding supports the study of Voorhees and Young (2003) that a sense of community had a relationship with physical activity in 285 Hispanic/Latino women. Higher scores (stronger sense of community) were associated with being physically active. Likewise, Okun and Michel (2006) found that a sense of community predicted volunteer activity among older adults living in poor communities.

Even though some studies supported this relationship, some studies did not. Ainsworth and others (2003) found a sense of community was not associated with physical activity among 917 African-American women living in two counties in South Carolina. Furthermore, the studies of Evenson, et al (2003), Eyler, et al (2003), Thomson, et al (2003), and Wilbur and others (2003) found the same results that a sense of community was not associated with physical activity among 671 Latina immigrants, among people aged 20 to 50 years living in North Carolina, among 1,000 rural white women aged 20 to 50 years, among 350 Native American women from the USA Southwest and among 300 volunteer Latinas, aged 20 to 50 years, living in Chicago, respectively.

This finding supports the indirect effect of a sense of community through physical activity self-efficacy. The possible reason that a sense of community has a significant positive direct effect on older adults' physical activity and a significant positive indirect effect through physical activity self-efficacy is because the feeling of attachment with their community, older adults might participate in or involve themselves in the community activities such as: exercise program, volunteer activity, activity in an elder club or even though just talking together. Consequently, older adults

may receive the benefits from this participation or involvement by increasing their physical activity performance and their physical activity self-efficacy may also increase.

In summary, this finding supported that a sense of community acted as a major predictor of physical activity and mediated through physical activity self-efficacy.

Hypothesis IV

This finding mostly supported this hypothesis in that neighborhood environments and facilities had a significant positive indirect effect to physical activity through a sense of community (β=0.15, $p<.01$) and physical activity self-efficacy (β=0.20, $p<.001$), but a positive direct effect on physical activity was not found (β=-0.05, $p>.05$).

Thus, this finding did not support the HPM and the SEM and many studies that proposed environment directly influence behaviors (Sallis & Owen, 1997). The environment can operate as a stressor exerting detrimental effects on people' mood, performance and physiology. It can function as a source of safety or danger also can serve as an enabler of health behavior (Stokols, 1996). Individuals tend to perform healthy behaviors in environments or situations they perceive will facilitate rather than impede, be connected rather than alienated, be harmonious rather than inharmonious, be safe and reassured rather than unsafe and threatened (Pender et al., 2002).

There are several possible reasons to support why, in this current study, neighborhood environment and facilities did not associate with urban poor older adults' physical activity. First, in this study, the neighborhood environment and facilities scale was developed from Western environments; therefore, it might not fit with Thai contexts. Also, due to the translation and back translation process, the important issues might be lost during these processes. Second, more than 80% of subjects lived in their communities more than ten years with an average 33.33 years of residence, while, some were born here thus they may adapt themselves and stay in this environment as it is normal. They themselves may perceive their environments and facilities differently from outsiders which perceived the environments as an eye sore.

This finding was inconsistent with the study of Booth and others (2000), Chad and others (2005) and Giles-Corti and Donovan (2002) that found older adults who had their house located near recreational facilities reported increased walking and

use of those facilities more than others who had the opposite. In addition, van Lenthe, Brug, and Mackenbach (2005) found that residents, aged between 20 to 69 years, living in the most disadvantaged neighborhood were less likely to do leisure time activities. Also, in Thailand, Asawachaisuwikrom (2001) found a relationship exists between exercise and the neighborhood environment and convenient facilities in older Thai adults.

Even though this current finding is inconsistent with many studies, it was supported by some studies that a positive direct effect of environment on physical activity was not found. For example, the study of Evenson and others (2003) found that neighborhood environments such as; traffic, street lighting, loose dogs, safety, and places within walking distance were not strong predictors of physical activity among Latina immigrants women aged 20 to 50 years. Furthermore, Wilcox and others (2003) found that perceived sidewalks and perceived traffic were negatively associated with physical activity among 102 African American and rural older women. Also, the study of Sanderson and others (2003) and Young and Voorhee (2003) found no association between neighborhood environment and facilities with the physical activity level among African-American women aged 20-50 years. Another study revealed that the indicators of availability of sports facilities, which were the number of swimming pools and the number of gyms, was not related with either swimming or gym use in either sex (Pascual et al., 2008).

The indirect effect of neighborhood environments and facilities to physical activity through physical activity self-efficacy was found in this study. This supports some studies that older adults who reported a greater neighborhood satisfaction had higher levels of efficacy to overcome barriers to exercise (Booth et al, 2000, McAuley et al., 2003; McNeill et al., 2006). These perceptions may act as a source of self-efficacy information that present a facilitative environment which influences efficacy expectations that in turn drive behavior (Bandura, 2001).

Furthermore, the indirect effect of neighborhood environments and facilities to physical activity through a sense of community was also found in this study. It confirmed the SEM that behavior is influenced by the interactions between the individual and their physical and social environment (Sallis & Owen, 2002). The more the person perceived facilities, connected, harmonious, and safe environment, the more

supportive and neighborhood ties developed (Byoung-Suk, Sullivan & Wiley, 1998). Consistent with the study of Kim and Kaplan (2004) that natural features and open spaces play an important role in achieving a sense of community because a rich variety of these are increasing the likelihood of social interactions. In turn, these environments may impede their neighborhood interactions (Krause, 1996) and relate to the older adults' withdrawal from the neighborhood (Byoung-Suk, Sullivan & Wiley, 1998; Chavis & Wandersman, 1990; Krause, 1996), if they were perceived negatively.

Hypothesis V

As hypothesized, perceived physical health has a positive significant direct effect on physical activity (β=0.18, $p<.05$) and a positive significant indirect effect through physical activity self-efficacy (β=0.40, $p<.001$).

This finding confirms the HPM that perceived physical health which is one component in perceived health status acts as a motivational source for performing actions by promoting individuals to be interested and perform healthy behavior in those cases who perceived themselves healthy. In the opposite way, in the cases who perceived a poor health status, this perception may act as a detriment, make individuals fearful and avoid and/or decrease their capacity to engage in healthy behavior (Pender, 1987).

Furthermore, this finding is also consistent with many studies. For example, the study of Booth, Bauman and Owen (2002), Dunn (2008) and Rosqvist and others (2008) that the most frequently cited barriers to regular participation in exercise behavior among older adults was poor health. Furthermore, Dawson and others (2007) and Gee (2005) found that the perceived health status had a significant relationship with overall physical activity levels of older adults and those who have hypertensive disease. Greater perceived good health was significantly associated with physical activity. In addition, Plonczynski and others (2008) found that physical health explained a significant portion of older adults' leisure time exercise. However, this finding is inconsistent with the study of Wilbur and others (2003) and Wilcox and others (2003) that the relationship between physical activity and perceived health status among 300 volunteer Latinas aged 20 to 50 years and rural older women was not found.

For the indirect effect, this finding supports that perceived physical health can influence older adults' self efficacy. This supports the study of Resnick and others (2000) and Resnick (2001) that perceived physical health was significantly associated with self efficacy expectation ($r=.34$, $p<.05$, $r=.53$, $p<.05$ respectively). Also, perceived physical health was indirectly associated with current exercise through self efficacy and/or outcome expectations (Resnick, 2001). Lower perception of one's health status has been associated with less exercise behavior and less overall activity in older adults (Gee, 2005). However, this study did not support the study of Resnick and others (2000) that reported no relationship between health status and physical activity among older adults living in a long term care retirement community. The reason might be the sample perceived themselves as healthy.

Because perceived physical health reflects the self-rated subjective health status, older adults who perceived poor physical health, may have an irregular lifestyle, physical and mental complaints. This may affect the physical activity self-efficacy and physical activity, including lifestyle and leisure time activity. This is the reason that perceived physical health has a positive significant direct effect on physical activity and a positive significant indirect effect through physical activity self-efficacy.

Hypothesis VI

Interestingly, this finding found an opposite direction between perceived mental health (which is defined as a self evaluation of the mental health problem) and physical activity that instead of perceived mental health should have a significant negative direct effect to physical activity, but it had a significant positive direct effect ($\beta=0.20$, $p<.001$). However, it partially supported this hypothesis that perceived mental health had a negative significant indirect effect through physical activity self-efficacy ($\beta=-0.28$, $p<.001$).

For the direct effect, this finding is inconsistent with many studies. For example, the study of Cohen-Mansfield and others (2003) found that mental health problem especially depression was related to less exercise in older adults age 74–85. Craft and others (2008) found that depressive symptoms were positively associated with barriers to exercise ($r=.35$, $p<.01$), and barriers were inversely related to exercise METs ($r= -.37$, $p<.05$). Furthermore, inconsistent with the study of Wilcox and others

(2003) and Wilcox and King (2004) those depressive symptoms were negatively associated with leisure time physical activity among older adults. Although the results found a negative relationship between depressive symptoms and less exercise, a few studies regarding to this relationship with overall physical activity have been studied.

There are some possible reasons to support this finding. Since perceived mental health was measured by the Diagnostic Screening Test for Depression (Kasantikul et al., 1997); therefore, participants who had scores lower than 25 indicate that they perceived good mental health. The score equals to 25 and higher 25 indicating perceived mental health problem or depression while the score equal to 30 and higher indicating major depression. Generally, mild depression has the same typical symptoms of depression, but the intensity is less than those of the severe severity. Even though mildly depressed sufferers may appear low in spirits and less sharp in their thought or interest, they can carry on their normal lives as usual (American Psychiatric Association, 2000). However, they may limit themselves to do only those things that they actually must do, such as going to work, do household activity, or caring for their families. They will stop doing activity that they perceive as non essential. Talking with empathetic family, relatives or close friends has proven a helpful way in dealing with mild depression.

The study of Allan and Dixon (2009) and Scattolon and Stoppard (1999) found that persons who perceived depress may hide their depression from other people and pretend that they were normal. They present being well and try to maintain their daily activities despite their emotional distress, because, they did not want to make others concerned. In this study, the results are consistent with above studies, that some subjects hide their mental health problem from other people and pretend to others that they are well. For example, two female and one male older adult said to the researcher, that, even though they felt blue and depressed, they did not want to concern others. Also, they had to continue to do everything as usual otherwise no one will do their tasks. Moreover, they had to maintain their work to earn their living. Summarizing this finding, we might state that mild depressed disadvantaged older adults responded to problems, especially money problems, in order to survive by more actively coping and adjusting themselves to their normal life, than performing passive behavior even though they perceived their mental health problems.

Another reason is, in this disadvantaged sample, the percentage of subjects who had indicated depression was 10.9%, while who had indicated major depression was 1.5%. Therefore, mild depressed persons might perform physical activity. In brief, in this study, physical activity performance in older adults is more influenced by the degree of depression and competency for survival and independent living.

For the indirect effect, this finding supported that the more positive affect, the greater the perceptions of self efficacy (Pender et al., 2002). This finding is also supported by many studies, that low mood disturbance is linked to stronger self-efficacy beliefs and better behavioral performance (Gecht et al., 1996, Kurlowicz, 1998, Perkins & Jenkins, 1998). Depression contributed to low self efficacy, because, individuals tend to recall and focus on past failure. This result is supported by the study of Ussher and others (2007), among patients with depression, compared to those with other mental disorders; the depressed group had a lower self efficacy than other groups. The feelings of helplessness, hopelessness and worthlessness, which are natures of depression, will destroy energy, self esteem and self efficacy (Lucidi et al., 2006).

Additional Path

According to the modification indices of the LISREL program combined with the supporting literature, a new path between perceived physical health and a sense of community was drawn which perceived physical health has a positive direct effect to a sense of community ($\beta=0.26$, $p<.001$).

Nowadays, increasing attention is being paid to the impact of a sense of community on perceived physical health well being. Many previous studies have examined the relationship between a sense of community and perceived physical health well being and concluded that a greater a perceived sense of community, a greater perceived physical health well being. For example, Yu, Zhang, Draper, Kassab, and Miles (1997) found that neighborhood relationships is one of the more significant predictors of self perceived physical health in 213 Chinese older adults. Ahmed and others (2002) found that the respondents living in a household that was organized by a large indigenous non-governmental organization in Bangladesh perceived their health status better than poor non-member households.

Omariba (2006) examined the relationship between individuals, households and community characteristics and health perceptions among Canadian older adults. The results clearly confirm that an older adults' sense of belonging to their community is one important predictor of their health status. The results also revealed that the probability of reporting excellent health increases with the level of a sense of belonging. Furthermore, the report from the health statistics division of Canada (2005) found that after potentially confounding factors were controlled, a sense of community belonging was strongly related to both the self-perceived general and mental health.

Even though many studies have concluded that the greater perceived a sense of community related with greater perceived health well being, the causal direction was limited whether perceived physical health effected a sense of community or not. Literature reviewed found that a perceived physical health may impact a sense of community in an indirect way. This result is that a person who perceived poor physical health might experience a poor health perception from a real physical impairment or another way from their mind which can limit their mobility, interaction with others, and the ability to work or volunteer (Walker, 2005). That may reduce the capacity and opportunities for participation in social activities when compared to those who perceived good health.

For example, a 73-year old female said to the researcher that previously she worked as a health care volunteer for her community and participated in many activities but now she had stopped doing all social activities. The reasons given are: 1) an advanced age, 2) the poor physical health perception and poor health she had. Staying home is comfortable for her. Another contrary example, a 72-year old male who had perceived good health and had no disease said he has been working as a health care volunteer more than 35 years and he will continue doing this activity if he can. He said, "Everyone here knew me". The reasons for his working are 1) love to help others and 2) want to improve the community condition. In sum, if persons are more prone to interact with each other, these interactions in turn continue to enhance the emotional connection and feeling of being part of the community (McMillan & Chavis, 1986).

Because most prior studies have focused on the effect of a sense of community on perceived physical health, examining the different effect dimension of perceived physical health on a sense of community will provide a new knowledge to nursing.

Strengths of the Study

1) The researcher developed the framework by combining selected concepts from the HPM which are generally testable with selected concepts from the SEM which focus on the interactions of the individual with the social and physical environment. This integrated theory provided a comprehensive understanding of environmental factors that can facilitate or hinder a person's effort to improve physical activity, and an understanding of the dynamic interplay between intrapersonal, social and cultural environment and physical environment in relation to physical activity.

2) The researcher collected the data by herself, thus, clarification of questionable items was made for the participants if any problems occurred. Also, the researcher selected one participant from a single household if there was more than one eligible recipient from a family in order to avoid confounding measurements.

3) Most instruments had good psychometric properties with Cronbach's alpha range from 0.78-0.94 which were acceptable to very good.

Limitations

1) This study is focused only on samples who lived in registered urban poor communities; therefore, these research results cannot be generalized to those who live in non registered urban poor and rural poor communities or other groups.

2) Concern for the researcher's safety; the researcher randomly selected the urban poor community and the older adult houses, if selected living places and/or community were not safe for the researcher to access following the recommendation from health care volunteers. This may lead to sampling bias.

3) Two instruments, which are, the neighborhood environment scale and the sense of community scale were translated and back translated from the English version. Some important issues may be lost in the translation process. Also, the context of Western countries was different from our country. Therefore, a sense of

community scale should be modified. Furthermore since the overall physical activity is proposed as the outcome variable, the neighborhood environment scale which was modified from the Neighborhood Environment Walk Ability Scale may not fit with the overall physical activity.

Summary

This study revealed that even though older Thai adults living in urban poor communities performed various kinds of physical activities, they performed at low intensities which were lower than those living in opposite condition. Also, the physical activity that they performed did not reach the physical activity recommendation. Therefore, tailoring the intervention according to older adults' contexts should be implemented. This finding is mostly supported with the HPM and the SEM that the interactions among persons and their environments, both physical and social cultural environment influence physical activity. Integrating these two theories provided a more complete understanding of the dynamic interplay between intrapersonal, interpersonal and extra personal factors in relation to physical activity.

CHAPTER VI
CONCLUSION

The summarized research study, implications and the contribution of the research findings and recommendations for future study are provided in this chapter.

Summary of the Study

The purpose of this cross-sectional descriptive design is to determine the factors predicting physical activity comprised of physical activity self-efficacy, perceived mental health, perceived physical health, social support, a sense of community, and neighborhood environment and facilities. The proposed model is derived from the HPM (Pender, 1996; Pender et al., 2006) and the SEM (Stokols, 1992, 1996).

Two hundred and fifty eight older adults met the inclusion criteria that were comprised of both males and females aged 60 years old or above, reside in urban poor communities at least one year, earn income less than 2,000 Baht per month, willing to participate, and have no cognition and perception problems determined by the Chula Mental Test score at 15 or more, were randomly selected using multistage random sampling. Seven questionnaires were employed to measure the construct variables including: 1) the modified physical activity for older Thai adults questionnaire, 2) the physical activity self-efficacy questionnaire, 3) the social support for physical activity questionnaire, 4) the neighborhood environment scale, 5) the sense of community scale, 6) the Short Form-36 Health Survey (SF 36) (version 2) (The physical composite summary), and 7) the Health Related Self Reported (HRSR) scales: The Diagnostic Screening Test for Depression in Thai Population. The demographic questionnaire and Chula Mental Test, which was used to evaluate cognitive functions and dementia symptoms in older adults, were also employed.

Demographic data was analyzed by using descriptive statistics executed by the SPSS 17.0 (PASW), Mahidol University license. Cronbach's Alpha Coefficient and

two week test-retest were used to determine the reliability of instruments. Cronbach's alpha of independent variables measurements ranged from .78-.94 which were acceptable to very good while the two week test-retest of the modified physical activity for older Thai adults was .98. Path analysis executed with the LISREL program version 8.52 which was provided by Mahidol University, was used to answer the researchers' questions and to test hypotheses. Furthermore, additional statistics which were independent t-test and ANOVA were used to compare variables characteristics.

The findings revealed that subjects were 190 female (73.6%) and 68 male (26.4%) with ages ranging from 60 to 88 (mean=69.85). Around half (48.8%) were young old aged 60-69 years. Most of them (70.2%) were Buddhists and had a four year formal education (n=146). Around half (47.3 %) were married. The majority of them (71.7%) had no jobs. Their monthly income ranged from 500-2,000 Baht per month (mean=1,317.83). Many of them (48.8%) had a normal BMI and most of them (83.3%) reported that they had at least one chronic disease. The maximum of years living in their community was 80 (mean= 33.61). A majority of them (83.7%) had no plan to move out and 84.5% had close friends or relatives in their community.

The results showed that almost of older adults had performed various kinds of physical activity within the previous seven days, but most of them performed at low levels. Young older adults participated in all types of physical activity in numbers and intensity greater than moderate and the oldest older adults. Female older adults performed various physical activities more than males, except exercise and transportation. Furthermore females performed more light and moderate intensity physical activity than males but males performed vigorous intensity than females. Regarding, exercise behaviors, most of them who exercised engaged in a light intensity workout and the number of hours per week physical activity performed was inadequate when compared with the physical activity recommendation.

For testing the hypothesized model, first the model did not fit with the empirical data. The researcher then modified it following the modification indices and supporting literature, by adding the path between perceived physical health and a sense of community. Finally, the modified model fit the data well (X^2 =9.64, df =7, X^2/ df =1.38, p=0.21, RMSEA=0.039, GFI=0.99, AGFI=0.96). The final model explained 33% of variation in physical activity, 51 % variance of physical activity self-efficacy

and 22 % variance of a sense of community, respectively.

The results found that physical activity self-efficacy and a sense of community were good mediators. A sense of community and perceived physical health had a positive direct effect on physical activity and a positive indirect effect on physical activity through physical activity self-efficacy. Perceived mental health had a negative indirect effect on physical activity through physical activity self-efficacy but had a positive direct effect on physical activity. Neither social support nor neighborhood environment and facilities significantly predicted physical activity; however, social support had a positive indirect effect on physical activity through a sense of community, and neighborhood environment and facilities had a positive indirect effect on physical activity through a sense of community and physical activity self-efficacy. An additional path suggested that perceived physical health had a significant direct effect to a sense of community.

Implications and Contribution of Research Findings

Implications for Nursing Science

First, owing to a lack of nursing knowledge regarding factors predicting physical activity in vulnerable groups, particularly older Thai adults living in urban poor communities; integrating the HPM (a nursing theory) with the SEM as theory underpinning can contribute to nursing knowledge about physical activity and explain the important roles of intrapersonal, interpersonal and extra personal variables (environment variable). These results provided additional findings about social cultural context of environment under the ways of life --a sense of community--of older adults, especially in disadvantaged groups, which had not yet been studied in Thai context.

Not only these findings can assumed that appropriated changes in the social cultural context of older adults will produce changes in older adults' physical activity, but also confirmed the nursing discipline which was proposed that environment is one of Meta-paradigm concept in nursing discipline. Therefore, implementing effective physical activity program should be concluded the role of environment variables both physical and social cultural environment.

Second, according to the hypotheses testing, the relationships among selected variables in this integrated model emerged logically. These results confirmed the HPM which was proposed that individual characteristics and experience have both direct and indirect effect on the health promoting behavior through behavior-specific cognitions. Furthermore, it was also confirmed the SEM which was focused on the nature of individual interactions with their physical and socio cultural surroundings. Testing the propositions derived from these two theories reflects the empirical adequacy and also, the credibility of these two theories. Therefore, this model could be used to explain and predict the phenomena of physical activity in older Thai adults living in urban poor communities. However social support, neighborhood environment and facilities, which were not significant, contribute to physical activity in this study, also perceived mental health which had a positive significance to physical activity should be reexamined.

In sum, integrating these two theories together provide a more comprehensive understanding of the dynamic interplay between intrapersonal, interpersonal and extra personal factors in relation to physical activity in older adults living in urban poor communities.

Implication for Nursing Practice

The results found that most subjects in this study performed physical activity at a low level that did not meet the physical activity recommendations. Since physical activity interventions from the literature review have been limited to older adults living in urban poor communities, intervention which will increase physical activity are needed to be implemented in this group in order to increase the physical activity level.

Community nurses or other health personnel should facilitate active living campaign in these communities by developing interventions that enhance overall physical activity. Not only exercise behavior should be promoted, but lifestyle physical activities such as: household activity, volunteer activity, occupation activity, walking for transportation and stairs climbing should be encouraged in these groups. Effective interventions need to be tailored and concerned with perspectives of low socioeconomic contexts including physical, mental, emotional, environmental and cultural contexts.

Community nurses should promote the establishment of an elderly club in each urban poor community. Increase sense of belonging to these clubs would in turn maximize the older adults' access to health-promoting behavior such as exercise behavior.

Community nurses can start the intervention with assessing the older adults' physical activity level. The assessment can be conducted through daily activities recording, observation, community surveys, focus groups, or individual interviews. According to the physical activity recommendations (Nelson et al., 2007), community nurses can use this recommendation to assess older adults' physical activity level and then encourage them to be more physically active. Not only from this nurses should assess physical activity related factors such as health problems, perceived physical health, social support, physical activity self-efficacy, a sense of community, neighborhood environment and facilities and so on.

Owing to the results that found physical activity self-efficacy and a sense of community are good mediators, therefore, developing the physical activity intervention should promote older adults' self efficacy and a sense of community. Furthermore, the perceived physical health has both a positive direct effect on physical activity and a positive indirect effect through physical activity self-efficacy and a sense of community. Once again, therefore, promoting the perceived good physical health should be established in older adults, especially those who encounter chronic disease and limited mobility.

Because in this study most subjects had a low to moderate physical activity self-efficacy score, providing older adults with strategies to overcome physical activity barriers, as well as, enhancing confidence so that they can overcome the barriers is essential. Older adults should be encouraged to reappraise their physical activity self efficacy. Self efficacy can be built by increasing the older adults' belief in their ability. Not only the ability belief, the secondary source of self efficacy is: vicarious experience or seeing similar people still active. Nurses or other health care professionals can be an active role model of physically active person or perhaps, can convince them that they should be able to do if others can do it or at least they should have some progress in their performance. Next, older adults should be involved by talking with others, such as, friends or others who have the ability to perform moderate intensity physical activity and have overcome physical activity barriers, even though

they have many barriers. The last source of self efficacy information is the physiological state. Nurses should design interventions that could reduce the aversive reaction of the physiological state such as: fatigue, boredom, and pain after performing physical activity.

In addition to physical activity self-efficacy, a sense of community is another mediator which had a positive direct effect and a positive indirect effect toward physical activity. According to the research results, a sense of community can be developed in urban poor communities, despite the limitations of poor circumstances. In order to develop and maintain a sense of community in urban poor communities, community nurses could work as a facilitator by joining with community leaders and members, older adults, health care volunteers and other supportive resources in the community such as: school, temple, mosque, church and other outside organizations to increase the community participation by setting up activities in communities. For example, promote and/or support an elderly club, arrange or facilitate exercise or a health promotion campaign, training the exercise trainers and so on. When the community members have activities together, they may offer support and empathy, share experience, norms, sanctions, and reciprocal relations. Members can develop a sense of community and an increased community empowerment. In addition, rituals and religious activity are also common ways to transmit a sense of community.

As mentioned above, older adults did not stay alone in the community, thus community involvement or meaningful participation of the community is another important factor. Physical activity participation can mean community members could adapt or stay physically active in the heart of the community, rather, than being designed by outside agencies or others. Nurses and community members could also arrange areas in urban poor communities for doing activity and exercise or finding facilities for dwellers to perform physical activity. Furthermore, information regarding physical activity such as: other kinds of activity, benefits of being physically active, the outcome of sedentary behavior and the physical activity guideline for older adults needs to be communicated.

Furthermore, any physical activity program needs to be tailored to the individuals' ability and limitation. Older adults who have a chronic illness with limited mobility should be encouraged to begin a low intensity form of physical activity

gradually and avoid excessive force against joints or muscles. In order to encourage sustainable levels of physical activity, nurses should provide them with feedback and positive reinforcement.

Implication for Future Nursing Research

Although these findings confirmed the credibility of the integrated model between the HPM and the SEM and could be used to explain and predict the phenomena of physical activity in older adults living in urban poor communities, the SEM which was proposed that behaviors were influenced by three domains including: 1) intrapersonal (demographic, biological, psychological); 2) social and cultural environment (family, peers, organizations, neighbors, communities, institutions, and public policies); and 3) physical environment (characteristics, access and facilities) (Sallis & Owen, 1997; Sallis et al., 2006) could be used to explain physical activity. Therefore, next study should be explored three domains of the SEM with physical activity.

A repeat testing this model should be done in different contexts in order to strengthen the model. Since these findings revealed that social support, neighborhood environment and facilities have no significant direct effect to physical activity; these factors should be re-validated in those who live in rural poor communities. Also, the comparison between the physical activity level of older adults who live in rural areas and those who live in urban areas should be studied. In addition, specific kinds of physical activity, for example: walking for exercise, volunteer activity or social activity should be explored.

Because the reliance on cross-sectional studies may limit interpretation of causality, future studies which duplicate testing using this model with a longitudinal design are needed to strengthen evidence of causality. Also, designing physical activity intervention that address interdependencies between the physical and social cultural environment within specific contexts and life domain should be done.

According to the congruent results with the SEM that physical activity is associated with different environmental variables; future research about environment is needed to provide detailed findings that can improve design of communities, transportation systems and recreational facilities.

The sense of community scale and the neighborhood environment scale were translated and back translated in order to fit within Thai context, important issues may be lost in the translation process due to the different ethnic cultures. Therefore, modifying or developing these measurements in Thai context is needed. Also, studying the sense of community meaning and its' influencing factors, especially the religious aspect should be explored in Thai context. Also, the relationship between senses of community with other health promoting behaviors should be studied, such as: social activity, nutrition, smoking cessation, mental health well being, quality of life and other self care behaviors.

Since perceived physical health is another variable that has both a positive direct effect and a positive indirect effect on physical activity, exploring factors affecting perceived good health should be explored in order to enhance this perception in poor older adults.

Implication for Health Policy

This research finding can serve as a basis for development of a physical activity program to an under studied population, older Thai adults living in urban poor communities. Physical activity programs should be promoted and tailored to the contexts of this group in order to increase and/or maintain their physical activity. If these older adults perform physical activity or active living, it may help them stay healthy in their communities. This means that the dependency rate and the medical care utilization and also health care cost may be reduced.

An active living policy with cooperating exercise, active recreation, household, occupation, and active transportation needs to be initiated in our society. Since this study showed that around 30% of subjects were overweight and 16.7% were obese that may lead to older adults' physical inactivity, therefore anti weight program should be provided to this group and cooperated with active living policy as well.

Strengthening the partnership with a multidisciplinary team such as health care personnel, and government and non-government agencies could provide the possible power for promoting an active living and healthy society. The policy could influence active living through the information environment, including counseling in

the health care setting, news, advertising and program components of mass media on television and radio broadcasts. Celebrities can act as a role model.

Not only from this active living policy could influence active living through funding and ordinances related to the healthfulness of the environment, such as, garbage disposal, traffic hazards and crime prevention, providing street light, and park, trail and facilities construction. Apart from constructing exercise facilities and a healthful environment, promoting its existence and the benefits of its use is needed. In order to translate research findings into environment policy and change practices, collaboration with policy researchers should be recognized.

In sum, in order to promote active living, the coalition of healthy public policy, supportive physical and social environments, public education and research development are required.

Conclusion

This study determined factors predicting physical activity in older Thai adults living in urban poor communities. The physical activity model underpinning the integrated the HPM and the SEM was tested. The research findings suggested that physical activity self-efficacy and a sense of community are good mediators. The knowledge gained from this study can be used to develop an effective intervention or guideline for promoting physical activity in daily life and can be used as a source for further study and health care policy development.

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APPENDICES

APPENDIX A

DOCUMENTARY PROOF OF ETHICAL CLEARANCE

คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล
ถนนพระราม 6 กทม. 10400
โทร. (662) 354-7275, 201-1296 โทรสาร (662) 354-7233
Faculty of Medicine, Ramathibodi Hospital, Mahidol University
Rama VI Road, Bangkok 10400, Thailand
Tel. (662) 354-7275, 201-1296 Fax (662) 354-7233

Documentary Proof of Ethical Clearance Committee on Human Rights Related to Researches Involving Human Subjects Faculty of Medicine, Ramathibodi Hospital, Mahidol University

MURA2009/1441

Title of Project	Factors Predicting Physical Activity in Thai Older Adults Living in Urban Poor Communities
Protocol Number	ID 05-52-08
Principal Investigator	Mrs. Phachongchit Kraithaworn
Official Address	Department of Nursing Faculty of Medicine, Ramathibodi Hospital Mahidol University

The aforementioned project has been reviewed and approved by Committee on Human Rights Related to Researches Involving Human Subjects, based on the Declaration of Helsinki.

Signature of Secretary Committee on Human Rights Related to Researches Involving Human Subjects	..... Assoc. Prof. Duangrurdee Wattanasirichaigoon, M.D.
Signature of Chairman Committee on Human Rights Related to Researches Involving Human Subjects	..... Prof. Boonsong Ongphiphadhanakul, M.D.
Date of Approval	June 4, 2009

No. ๙ ๘๘

Ethics Committee

For

Researches Involving Human Subjects, the Bangkok Metropolitan Administration

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Title of Project	:	Factors Predicting Physical Activity in Thai Older Adults Living in Urban Poor Communities
Registered Number	:	071.52
Principal Investigator	:	Mrs. Phachongchit Kraithaworn
Name of Institution	:	Mahidol University

The aforementioned project has been reviewed and approved by Ethics Committee for Researches Involving Human Subjects, based on the Declaration of Helsinki.

K. Kaewnil

..... Chairman

(Mr. Kraichack Kaewnil)

Deputy Permanent Secretary for BMA

DATE OF APPROVAL 1 JUL 2009

มูลนิธิดวงประทีป
DUANG PRATEEP FOUNDATION
ก่อตั้งปี พ.ศ. 2521

มูลนิธิดวงประทีป ล็อค 6 สลัมคลองเตย ถ.อาจณรงค์ คลองเตย กรุงเทพฯ 10110
โทร . 02-249-3553, 02-249-4880, 02-249-8842, 02-671-4045-8 โทรสาร: 02-249-5254
DUANG PRATEEP FOUNDATION, Lock 6, Klong Toey, Bangkok 10110
Tel . 02-249-3553, 02-249-4880, 02-249-8842, 02-671-4045-8 Fax: 02-249-5254
E-Mail : dpffound@ksc.th.com, http://www.dpf.or.th

Phachongchit Kraithaworn
Doctoral Candidate
270 Rama 6 Road
Department of nursing, Faculty of Medicine
Ramathibodi Hospital, Mahidol University
Ratchthewi, Bangkok 10400
Thailand

Dear Ms. Phachongchit

You have my permission to conduct your pilot study and dissertation "Factors Predicting Physical Activity in Thai Older Adult living in Urban Poor Communities" at Duang Prateep Foundation, Bangkok. I am pleased to provide you any assistance to access to older adults for recruitment and data collection process.

Sincerely,

Prateep Ungsongtham Hata
Chairperson

บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

ใบรับรอง เพื่อแสดงว่า

นางผจงจิต ไกรถาวร รหัสนักศึกษา 4836650 NRNS/D

คณะพยาบาลศาสตร์ และภาควิชาพยาบาลศาสตร์ คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี

เป็นผู้ผ่านการเรียนชั่วโมง " จริยธรรมการวิจัยในคน "

ในรายวิชา SCID 518 Generic Skills in Science Research

คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

เมื่อวันที่ 30 ตุลาคม 2551

ลงนาม .....

(รองศาสตราจารย์ ดร.สุขุมาล จงธรรมคุณ)

อาจารย์ผู้รับผิดชอบรายวิชา / ผู้ประสานงานรายวิชา

ลงนาม .....

(ศาสตราจารย์ แพทย์หญิง พรรณแข มไหสวริยะ)

อาจารย์ผู้สอน

APPENDIX B

PERMISSION LETTERS FOR USING THE INSTRUMENTS

Division of Geriatric medicine and Gerontology,
Department of medicine, Faculty of medicine
Chulalongkorn University Thailand
Tel. 662 256 4449
Fax. 662 251 1296

Dear Ms Phachongchit Kraithaworn
Phachongchit Kraithaworn
Doctoral Candidate
270 Rama 6 Road,
Department of Nursing, Faculty of Medicine,
Ramathibodi Hospital, Mahidol University
Ratchathewi, Bangkok, 10400
Thailand

This is to confirm that you have my permission to use the "Chula Mental Test (1996)" for your research.

Yours sincerely

Prof.Sutthichai Jitapunkul, MD.
Head of division of Geriatric medicine and Gerontology,
Department of medicine, Faculty of medicine
Chulalongkorn University Thailand
Tel. 662 256 4449 Fax. 662 251 1296
e-mail: sutthichai.j@chula.ac.th

Phachongchit Kraithaworn
Doctoral Candidate
270 Rama 6 Road,
Department of Nursing, Faculty of Medicine,
Ramathibodi Hospital, Mahidol University
Ratchathewi, Bangkok, 10400
Thailand

Dear Phachongchit Kraithaworn

It is my pleasure to give you a permission to use the "Health Related Self Report (HRSR) Scale: The diagnostic Screening Test for Depression in Thai Population (1997)".

Please do not hesitate to contact me for any unclear document

Thank you for interest in this questionnaire

Sincerely Yours

D. Kasantikul M.D

Professor Duangjai Kasantikul MD.
Department of Psychiatry
Faculty of Medicine
Chulalongkorn University

หลักสูตรปรัชญาดุษฎีบัณฑิต
คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล
๒ บางกอกน้อย กรุงเทพฯ ๑๐๗๐๐
โทร. I + ๕๑ ต่อ ๑๔๑๑, ๑๔๑๒

ที่ ศธ ๐๕๑๗.๐๕ (ปร.ค.)/๒๗๗
วันที่ ๒๐ กรกฎาคม ๒๕๕๒
เรื่อง อนุญาตให้ใช้เครื่องมือวิจัย

เรียน นางผจงจิต ไกรถาวร

ตามที่ท่านได้ขออนุญาตใช้เครื่องมือวิจัยของนักศึกษาในหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาการพยาบาล (หลักสูตรนานาชาติ และหลักสูตรร่วมกับมหาวิทยาลัยในต่างประเทศ) และหลักสูตรพยาบาลศาสตรดุษฎีบัณฑิต คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล ดังนี้คือ

- แบบสอบถามกิจกรรมการเคลื่อนไหวออกแรง และการออกกำลังกายสำหรับผู้สูงอายุไทยในชุมชน ของ นางวนิดา วิสุทธิพานิช
- การรับรู้สมรรถนะด้านการออกกำลังกายของผู้สูงอายุ ของ นางสาวประภาพร จินันทุยา
- การสนับสนุนทางสังคมด้านการออกกำลังกายของผู้สูงอายุ ของ นางสาวประภาพร จินันทุยา

หลักสูตรฯ ได้พิจารณาแล้วยินดีให้ใช้เครื่องมือของนักศึกษาในหลักสูตรฯ ระบุให้ชัดเจนว่าใช้เครื่องมือวิจัยทุกแบบสอบถามหรือเป็นบางส่วนและให้ระบุว่าเครื่องมือวิจัยดังกล่าวมาจากวิทยานิพนธ์ของนักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิตฯ และหลักสูตรพยาบาลศาสตรดุษฎีบัณฑิต มหาวิทยาลัยมหิดล ถ้าหากมีการละเมิดเกิดขึ้นข้าพเจ้ายินยอมให้คณะพยาบาลศาสตร์ดำเนินการตามกฎหมาย และให้ปฏิบัติตามระเบียบการยืมเครื่องมือวิจัยดังกล่าวด้วย

จึงเรียนมาเพื่อทราบ

ฟองคำ ติลกสกุลชัย

(รองศาสตราจารย์ ดร.ฟองคำ ติลกสกุลชัย)
คณบดีคณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

BCM
Baylor College of Medicine

CHILDREN'S NUTRITION RESEARCH CENTER
Department of Pediatrics

TEXAS MEDICAL CENTER
1100 BATES STREET
HOUSTON, TEXAS 77030-2600
713-798-7000
713-798-7098 FAX

January 28, 2009

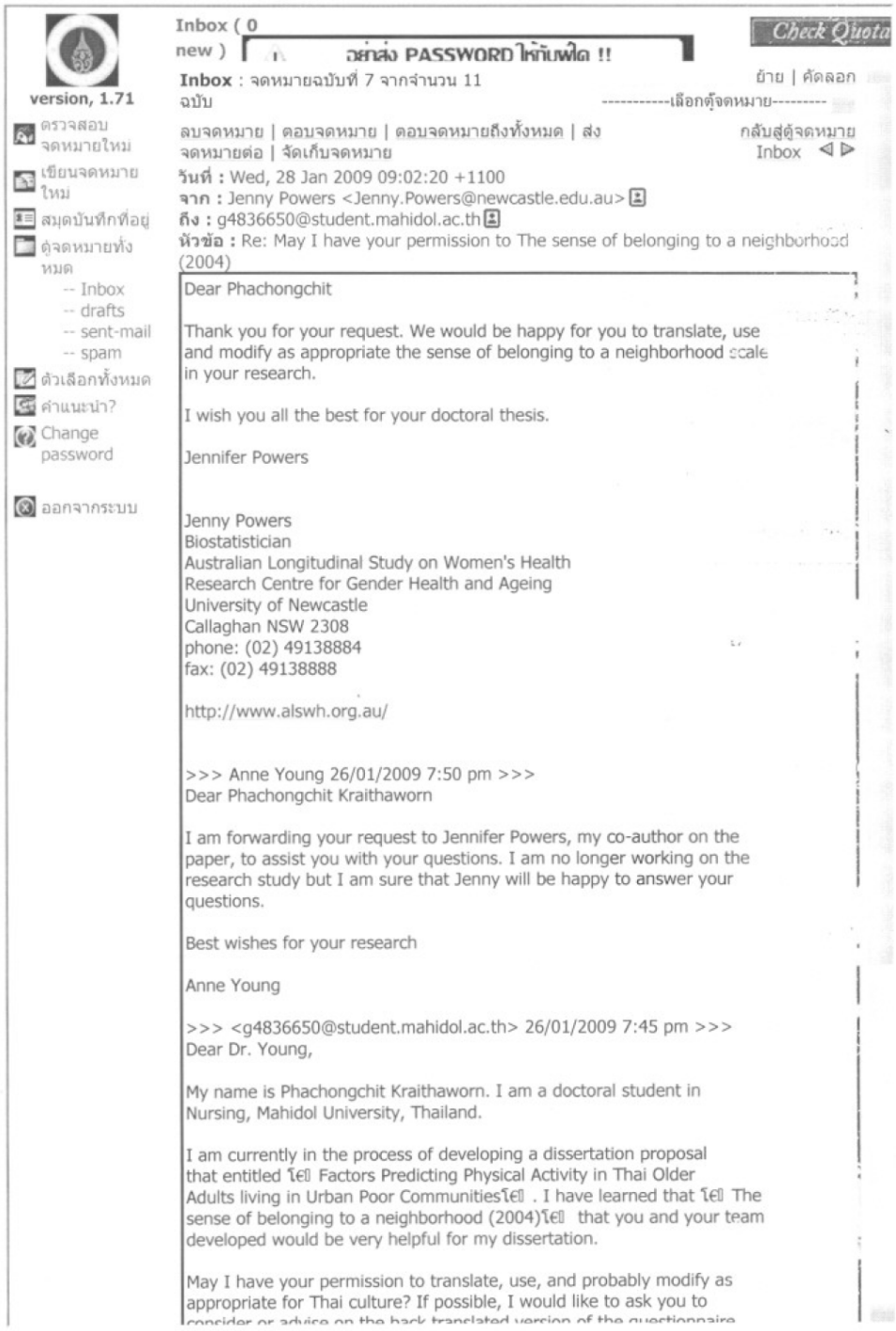
TO WHOM IT MAY CONCERN

This is to confirm that Phachongchit Kraithaworn, PhD student enrolled at Mahidol University, Bangkok, Thailand have my (Ester Cerin) and my co-authors' (Brian E Saelens, James F. Sallis, and Lawrence D. Frank) permission to translate, use, and (if necessary) modify the Neighborhood Environment Walkability Scale – Abbreviated (NEWS-A) for research purposes in Thailand.

We appreciate your interest in our research and are looking forward to collaborating with you on the development and validation of the NEWS-A adapted for a Thai population.

Sincerely,

Ester Cerin, PhD
Children's Nutrition Research Center
Baylor College of Medicine
1100 Bates St.
Houston, TX 77030, USA
Email: cerin@bcm.edu



version, 1.71

ตรวจสอบจดหมายใหม่
เขียนจดหมายใหม่
สมุดบันทึกที่อยู่
ตู้จดหมายทั้งหมด
-- Inbox
-- drafts
-- sent-mail
-- spam
ตัวเลือกทั้งหมด
คำแนะนำ?
Change password
ออกจากระบบ

Inbox (0 new)

Check Quota

อย่าส่ง PASSWORD ให้กับเพื่อน !!

Inbox : จดหมายฉบับที่ 7 จากจำนวน 11 ฉบับ

ย้าย | คัดลอก

----------เลือกตู้จดหมาย---------

ลบจดหมาย | ตอบจดหมาย | ตอบจดหมายถึงทั้งหมด | ส่งจดหมายต่อ | จัดเก็บจดหมาย

กลับสู่ตู้จดหมาย Inbox

วันที่ : Wed, 28 Jan 2009 09:02:20 +1100
จาก : Jenny Powers <Jenny.Powers@newcastle.edu.au>
ถึง : g4836650@student.mahidol.ac.th
หัวข้อ : Re: May I have your permission to The sense of belonging to a neighborhood (2004)

Dear Phachongchit

Thank you for your request. We would be happy for you to translate, use and modify as appropriate the sense of belonging to a neighborhood scale in your research.

I wish you all the best for your doctoral thesis.

Jennifer Powers

Jenny Powers
Biostatistician
Australian Longitudinal Study on Women's Health
Research Centre for Gender Health and Ageing
University of Newcastle
Callaghan NSW 2308
phone: (02) 49138884
fax: (02) 49138888

http://www.alswh.org.au/

>>> Anne Young 26/01/2009 7:50 pm >>>
Dear Phachongchit Kraithaworn

I am forwarding your request to Jennifer Powers, my co-author on the paper, to assist you with your questions. I am no longer working on the research study but I am sure that Jenny will be happy to answer your questions.

Best wishes for your research

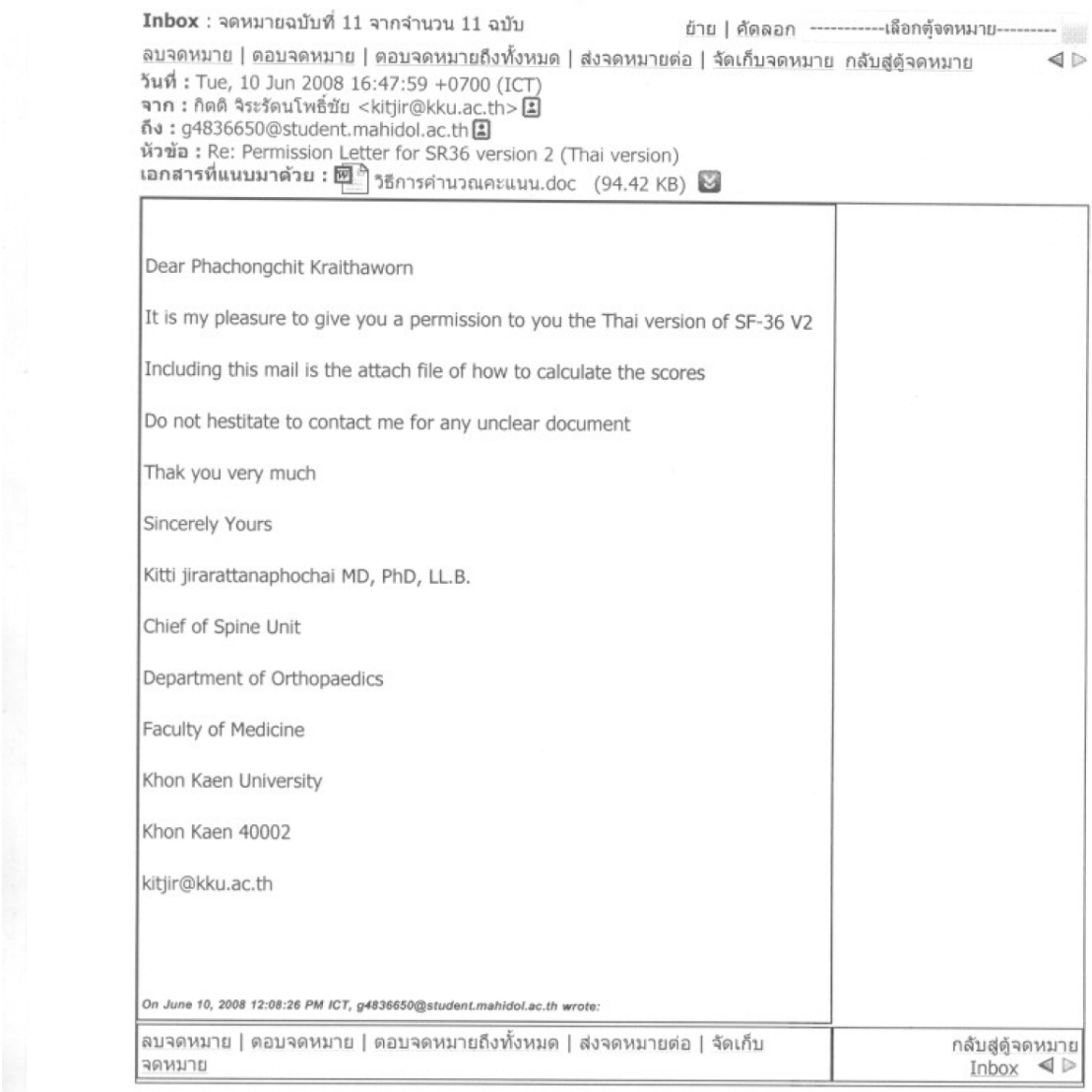
Anne Young

>>> <g4836650@student.mahidol.ac.th> 26/01/2009 7:45 pm >>>
Dear Dr. Young,

My name is Phachongchit Kraithaworn. I am a doctoral student in Nursing, Mahidol University, Thailand.

I am currently in the process of developing a dissertation proposal that entitled "Factors Predicting Physical Activity in Thai Older Adults living in Urban Poor Communities" . I have learned that "The sense of belonging to a neighborhood (2004)" that you and your team developed would be very helpful for my dissertation.

May I have your permission to translate, use, and probably modify as appropriate for Thai culture? If possible, I would like to ask you to consider or advise on the back translated version of the questionnaire



Inbox : จดหมายฉบับที่ 11 จากจำนวน 11 ฉบับ ย้าย | คัดลอก ----------เลือกตู้จดหมาย---------

ลบจดหมาย | ตอบจดหมาย | ตอบจดหมายถึงทั้งหมด | ส่งจดหมายต่อ | จัดเก็บจดหมาย กลับสู่ตู้จดหมาย

วันที่ : Tue, 10 Jun 2008 16:47:59 +0700 (ICT)
จาก : กิตติ จิระรัตนโพธิ์ชัย <kitjir@kku.ac.th>
ถึง : g4836650@student.mahidol.ac.th
หัวข้อ : Re: Permission Letter for SR36 version 2 (Thai version)
เอกสารที่แนบมาด้วย : วิธีการคำนวณคะแนน.doc (94.42 KB)

Dear Phachongchit Kraithaworn

It is my pleasure to give you a permission to you the Thai version of SF-36 V2

Including this mail is the attach file of how to calculate the scores

Do not hestitate to contact me for any unclear document

Thak you very much

Sincerely Yours

Kitti jirarattanaphochai MD, PhD, LL.B.

Chief of Spine Unit

Department of Orthopaedics

Faculty of Medicine

Khon Kaen University

Khon Kaen 40002

kitjir@kku.ac.th

On June 10, 2008 12:08:26 PM ICT, g4836650@student.mahidol.ac.th wrote:

ลบจดหมาย | ตอบจดหมาย | ตอบจดหมายถึงทั้งหมด | ส่งจดหมายต่อ | จัดเก็บจดหมาย

กลับสู่ตู้จดหมาย Inbox

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License Number: CT118080 / OP002194

Effective Date: June 22, 2009

Licensee Name: Mrs. Phachongchit Kraithaworn

Licensee Address: 188/ 33 (68) Phanason villa 10
Phachongchit Kraithaworn
Soi Chalermprakiet 48 ext. 19
Chalermprakiet Lo 9 road, Dogmai subd
10250 Prawet district
Bangkok, Thailand

Requested Administrations: 198 **Approved Administrations:** Two Times Requested Administrations

Approved Use: Non-commercial academic research - unfunded – "Factors Predicting Physical Activity in Thai Older Adults Living in Urban Poor Communities"

Term: Beginning on July 1, 2009 and ending on June 30, 2010

Licensed Surveys: As indicated in Appendix B attached

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Mrs. Phachongchit Kraithaworn
188/ 33 (68) Phanason villa 10
Phachongchit Kraithaworn
Soi Chalermprakiet 48 ext. 19
Chalermprakiet Lo 9 road, Dogmai subd
10250 Prawet district
Bangkok, Thailand

Signature: Phachongchit Kraithaworn

Name: Phachongchit Kraithaworn

Title: Mrs.

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APPENDIX A

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Licensed Surveys and Approved Languages

SF-36v2® Health Survey – Standard Recall
Thailand (Thai)

Required Manuals (price not included in Administrative Fee)

(581) PDF - SF-36v2® Health Survey: A Primer for Healthcare Providers

(534) QualityMetric Health Outcomes™ Scoring Software 2.0

APPENDIX C

PATIENT/ PARTICIPANT INFORMATION SHEET AND CONSENT FORM

My name is Phachongchit Kriathaworn. I am a graduate student at Mahidol University. You are invited to participate in my study about factors predicting physical activity in Thai older adults living in urban poor communities. You are eligible for this study because you are 60 years or older, and live in urban poor community, Bangkok.

If you decide to participate in this study, I will interview you about your personal information, your physical activity, how you perceived about your physical health and mental health, how confident you are about physical activity performing, how your family and friends support you performing physical activity, how your environments and a sense of community related to your physical activity. The interview will take about 45-50 minutes to complete. Your participation will provide valuable information to nurse and other health care professors to designing and tailoring interventions to increase physical activity that meet the unique needs in these specific settings urban poor community.

Because this study uses the interview technique, there are no risks to participants. However the major inconvenience will be the time consuming spending for the interview. A short break period will be taken if you request. You can stop and withdraw from the study any time you want. Your information will be kept confidential. The results will be published as a group and the questionnaire will be destroyed after finishing the study.

Your decision to participate in this study will not affect your present or future relationship and the service that you will receive from public health care unit or other health care facilities. This participation is voluntary. If you have any question about the study, please ask me of if you have additional questions later, you can contact me by my mobile phone number 018-5548605. Your signature below indicated you know the information provided above. This signature in this consent form will not affect any your legal rights. You will be received a copy of this document to keep.

Thank you very much for your participation.

…… (Researcher)

For participants

I was informed about the detailed of the study and I agree to participate in this study.

……. (Participant) (Date ……/……../……..)

เอกสารชี้แจงข้อมูล/ คำแนะนำแก่ผู้เข้าร่วมการวิจัย

(Patient/Participant Information Sheet)

ชื่อโครงการ ปัจจัยทำนายกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุไทย ที่อาศัยอยู่ในชุมชนแออัด เขตเมือง

ชื่อผู้วิจัย นางผจงจิต ไกรถาวร

สถานที่วิจัย ชุมชนแออัด ในกรุงเทพมหานคร

บุคคลและวิธีการติดต่อเมื่อมีเหตุฉุกเฉิน หรือความผิดปกติที่เกี่ยวข้องกับการวิจัย

นางผจงจิต ไกรถาวร
188/33 หมู่บ้านพนาสนธิ์วิลล่า 10 ซอยเฉลิมพระเกียรติ 48 ดอกไม้ ประเวศ
กรุงเทพมหานคร 10250
โทรศัพท์ 081-5548605

รองศาสตราจารย์ ดร. ยุพาพิน ศิรโพธิ์งาม
ภาควิชาพยาบาลศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี
มหาวิทยาลัยมหิดล 10400
โทรศัพท์ 02-201-1278

ผู้สนับสนุนการวิจัย -

ความเป็นมาของโครงการ

เมื่อบุคคลมีอายุเพิ่มมากขึ้นจะนำมาซึ่งความเสื่อมถอยอันนำไปสู่การเกิดโรคเรื้อรัง พิการและทุพพลภาพ เป็นภาระต้องพึ่งพาผู้อื่น ส่งผลกระทบโดยตรงต่อผู้สูงอายุ ครอบครัว และ เศรษฐกิจของประเทศ ซึ่งความเสื่อมถอยดังกล่าวสามารถชะลอการเกิดได้โดยการส่งเสริมให้ผู้สูงอายุมีสุขภาพดีและพึ่งพาตนเอง วิธีการหนึ่งที่สามารถช่วยให้ผู้สูงอายุมีสุขภาพดีและพึ่งพาตนเองได้นั้น คือ การส่งเสริมให้ผู้สูงอายุคงไว้ซึ่งการทำกิจกรรมการเคลื่อนไหวออกแรง กิจกรรมการเคลื่อนไหวออกแรง หมายถึง การเคลื่อนไหวส่วนต่าง ๆ ของร่างกายอันเกิดจากการทำงานของกล้ามเนื้อที่มีผลทำให้เกิดการใช้พลังงาน กิจกรรมเหล่านี้ ประกอบด้วย การทำงานบ้าน งานอาชีพ การเดินทาง และงานอดิเรก เช่น การออกกำลังกาย การเล่นกีฬา และนันทนาการ การศึกษาวิจัยพบว่าหากทำกิจกรรมเหล่านี้อย่างสม่ำเสมอจะช่วยลดอุบัติการณ์การเกิดโรคเบาหวาน โรคความดันโลหิตสูง โรคหัวใจ โรคกระดูกพรุน โรคมะเร็งลำไส้ โรคซึมเศร้า เป็นต้น นอกจากนี้ ยังช่วยเสริมสร้างความมั่นใจและคงไว้ซึ่งการมีปฏิสัมพันธ์กับผู้อื่น นำไปสู่การมีสุขภาพจิตและคุณภาพชีวิตที่ดี

ถึงแม้ว่ากิจกรรมการเคลื่อนไหวออกแรงจะนำมาซึ่งประโยชน์มากมายดังกล่าวแล้วข้างต้น รายงานวิจัยพบว่า ผู้สูงอายุส่วนหนึ่งทำกิจกรรมการเคลื่อนไหวออกแรงลดลง นอกจากนี้งานวิจัยในต่างประเทศยังพบว่าผู้สูงอายุที่มีรายได้น้อยที่อาศัยอยู่ในชุมชนแออัดมีกิจกรรมการเคลื่อนไหวออกแรงน้อยกว่าผู้สูงอายุที่มีรายได้ดีและมีสภาพความเป็นอยู่ที่ดีกว่า เหตุผลเนื่องมาจากการที่ต้องอาศัยอยู่ในสิ่งแวดล้อมที่ทรุดโทรม มีแหล่งอาชญากรรมมากมาย และไม่สามารถเข้าถึงแหล่งออกกำลังกายหรือแหล่งอำนวยความสะดวกต่าง ๆ สิ่งเหล่านี้ถือเป็นอุปสรรคสำคัญต่อการทำกิจกรรมการเคลื่อนไหวออกแรงทั้งสิ้น ถึงแม้ว่าประเทศไทยจะมีการศึกษาปัจจัยทำนายกิจกรรมการเคลื่อนไหวออกแรงและการออกกำลังกายของผู้สูงอายุไทย แต่ผลการศึกษาที่ผ่านมาไม่สามารถที่จะนำไปประยุกต์ใช้ในกลุ่มผู้สูงอายุที่อาศัยอยู่ในชุมชนแออัด เขตเมืองได้ เนื่องจากมีบริบทด้านบุคคล สังคม และสิ่งแวดล้อมที่แตกต่างจากผู้สูงอายุทั่วไป

จากรายงานของสำนักงานสถิติแห่งชาติ พบว่าในปี 2550 ร้อยละ 11 ของผู้อยู่อาศัยในชุมชนแออัดในกรุงเทพมหานครเป็นผู้สูงอายุ และมีแนวโน้มว่าจะมีจำนวนผู้สูงอายุเพิ่มมากขึ้นเรื่อย ๆ ดังนั้นการส่งเสริมให้ผู้สูงอายุกลุ่มนี้สามารถดำรงไว้ซึ่งการทำกิจกรรมการเคลื่อนไหวออกแรงจึงเป็นเป้าหมายหนึ่งที่มีความสำคัญ ซึ่งก่อนที่จะพัฒนาโปรแกรมส่งเสริมการทำกิจกรรมทางการเคลื่อนไหวออกแรงได้นั้น พยาบาลและเจ้าหน้าที่ทีมสุขภาพควรที่จะทราบถึงปัจจัยที่มีผลต่อการทำกิจกรรมการเคลื่อนไหวออกแรงนี้เสียก่อน เพื่อที่จะเป็นข้อมูลพื้นฐานนำไปสู่การพัฒนาโปรแกรมส่งเสริมการทำกิจกรรมทางการเคลื่อนไหวออกแรงสำหรับผู้สูงอายุที่อาศัยอยู่ในชุมชนแออัดที่มีประสิทธิภาพต่อไป

วัตถุประสงค์

เพื่อศึกษาความสัมพันธ์เชิงสาเหตุระหว่างปัจจัยด้าน การรับรู้สมรรถนะในตนด้านการทำกิจกรรมการเคลื่อนไหวออกแรง การสนับสนุนทางสังคม ภาวะซึมเศร้า การรับรู้สุขภาพกาย การรับรู้สิ่งแวดล้อมละแวกบ้าน และ ความรู้สึกเป็นส่วนหนึ่งของชุมชน ต่อการทำกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุไทยที่อาศัยอยู่ในชุมชนแออัด เขตเมือง

รายละเอียดที่จะปฏิบัติต่อผู้เข้าร่วมการวิจัย

1) ผู้วิจัยจะถามความสมัครใจในการเข้าร่วมโครงการของผู้สูงอายุที่มีคุณสมบัติตามที่ต้องการ

2) ผู้วิจัยจะอธิบายวัตถุประสงค์ และ ขั้นตอนการเก็บรวบรวมข้อมูลแก่ผู้สูงอายุ จะดำเนินการเก็บรวบรวมข้อมูลโดยการสัมภาษณ์ด้วยแบบสอบถามจำนวน 9 ชุด สถานที่สัมภาษณ์คือ ที่บ้านของผู้สูงอายุหรือที่ที่ผู้สูงอายุสะดวก

3) การสัมภาษณ์จะแบ่งออกเป็น 2 ช่วงโดยช่วงที่หนึ่ง ผู้วิจัยจะทำการประเมินสภาพจิตเพื่อทำการคัดเลือกผู้สูงอายุเข้าร่วมโครงการ หากผู้สูงอายุมีคะแนนของแบบวัดน้อยกว่าค่าที่กำหนดไว้อันบ่งชี้ว่ามีปัญหาทางด้านสมองผู้วิจัยจะทำการคัดออกจากการศึกษา จากนั้นจะสัมภาษณ์ผู้สูงอายุเกี่ยวกับข้อมูลทั่วไป เช่น อายุ สถานภาพสมรส อาชีพ โรคประจำตัว และพฤติกรรมเสี่ยงทางสุขภาพ เป็นต้น จะทำการประเมินกิจกรรมการเคลื่อนไหวออกแรง ประเมินการรับรู้สมรรถนะในตนด้านการทำกิจกรรมการเคลื่อนไหวออกแรง และประเมินการสนับสนุนทางสังคม

4) ผู้วิจัยจะให้ผู้สูงอายุพักประมาณ 5-10 นาทีก่อนสัมภาษณ์ในช่วงที่สอง โดยให้มีการรับประทานอาหารว่าง ได้แก่ นมและขนมปัง จากนั้นจะทำการสัมภาษณ์ต่อโดยประเมินการรับรู้สภาพสิ่งแวดล้อมละแวกบ้าน ประเมินความรู้สึกเป็นส่วนหนึ่งของชุมชน ประเมินภาวะซึมเศร้า และประเมินการรับรู้สุขภาพกาย ผู้สูงอายุจะใช้

เวลาในการตอบแบบสอบถามทั้งสิ้นประมาณ 45-50 นาที ภายหลังจากสิ้นสุดการสัมภาษณ์ผู้สูงอายุจะได้รับสบู่ 1 ก้อน และแป้ง 1 กล่อง เป็นการตอบแทนที่เข้าร่วมโครงการ

5) ผู้วิจัยจะเปิดโอกาสให้ผู้สูงอายุซักถามในสิ่งที่ไม่เข้าใจ เมื่อผู้สูงอายุเข้าใจวัตถุประสงค์ และขั้นตอนการเก็บรวบรวมข้อมูลของการศึกษาครั้งนี้ และสมัครใจที่จะเข้าร่วมในการศึกษา ผู้วิจัยจะให้ผู้สูงอายุลงชื่อในหนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจ

ประโยชน์และผลข้างเคียงที่จะเกิดแก่ผู้เข้าร่วมการวิจัย

การศึกษาครั้งนี้จะทำให้ผู้สูงอายุได้ทราบถึงการทำกิจกรรมการเคลื่อนไหวออกแรงของตนเอง และทราบถึงปัจจัยที่มีผลต่อการทำกิจกรรมดังกล่าว นอกจากนี้ผลของการวิจัยจะทำให้พยาบาลและเจ้าหน้าที่ในทีมสุขภาพเข้าใจถึงปัจจัยที่เกี่ยวข้องกับการทำกิจกรรมการเคลื่อนไหวออกแรง และ นำไปสู่การพัฒนาโปรแกรมการส่งเสริมการดำรงไว้ซึ่งกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุที่อาศัยอยู่ในชุมชนแออัด เขตเมืองให้มีประสิทธิภาพต่อไป

การศึกษาครั้งนี้เป็นการตอบแบบสอบถาม จึงไม่มีผลข้างเคียงที่กระทบต่อร่างกาย แต่อาจมีคำถามบางคำถามที่อาจจะกระทบความรู้สึก และ จำนวนข้อของแบบสอบถามอาจทำให้ผู้สูงอายุเกิดความอ่อนล้าและเบื่อหน่ายจากการตอบแบบสอบถามได้ ดังนั้นผู้สูงอายุจึงมีสิทธิที่จะปฏิเสธการตอบแบบสอบถาม หรือถอนตัวออกจากการศึกษาครั้งนี้ได้ทุกเวลาที่ผู้สูงอายุต้องการ

การเก็บข้อมูลเป็นความลับ

ข้อมูลส่วนตัวของผู้สูงอายุจะได้รับการเก็บรักษาไว้ ไม่เปิดเผยต่อสาธารณะเป็นรายบุคคล แต่จะรายงานผลการวิจัยเป็นข้อมูลส่วนรวม การเปิดเผยข้อมูลเกี่ยวกับผู้สูงอายุต่อหน่วยงานต่างๆที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น และข้อมูลในแบบสอบถามผู้สูงอายุเก็บไว้เป็นความลับ ผู้วิจัยจะทำการทำลายแบบสอบถามเหล่านั้นด้วยตนเองภายหลังเสร็จสิ้นการวิจัย

ถ้าท่านมีปัญหาข้องใจหรือรู้สึกกังวลใจกับการเข้าร่วมในโครงการวิจัยนี้ ท่านสามารถติดต่อกับประธานกรรมการจริยธรรม

หนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจ

(Informed Consent Form)

ชื่อโครงการ ปัจจัยทำนายกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุไทย ที่อาศัยอยู่ในชุมชนแออัด เขตเมือง

ชื่อผู้วิจัย นางผจงจิต ไกรถาวร

*ชื่อผู้เข้าร่วมการวิจัย .....

อายุ .....

คำยินยอมของผู้เข้าร่วมการวิจัย

ข้าพเจ้า นาย/นาง/นางสาว ..... ได้ทราบรายละเอียดของโครงการวิจัยตลอดจนประโยชน์ และข้อเสี่ยงที่จะเกิดขึ้นต่อข้าพเจ้าจากผู้วิจัยแล้วอย่างชัดเจน ไม่มีสิ่งใดปิดบังซ่อนเร้นและยินยอมให้ทำการวิจัยในโครงการที่มีชื่อข้างต้น และข้าพเจ้ารู้ว่าถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้น ข้าพเจ้าสามารถสอบถามผู้วิจัยได้ และข้าพเจ้าสามารถไม่เข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ โดยไม่มีผลกระทบต่อการรักษาที่ข้าพเจ้าพึงได้รับ นอกจากนี้ผู้วิจัยจะเก็บข้อมูลเฉพาะเกี่ยวกับตัวข้าพเจ้าเป็นความลับและจะเปิดเผยได้เฉพาะในรูปที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ลงชื่อ.....(ผู้เข้าร่วมการวิจัย)

.....(พยาน)

.....(พยาน)

วันที่ .....

คำอธิบายของผู้วิจัย

ข้าพเจ้าได้อธิบายรายละเอียดของโครงการ ตลอดจนประโยชน์ของการวิจัย รวมทั้งข้อเสี่ยงที่อาจจะเกิดขึ้นแก่ผู้เข้าร่วมการวิจัยทราบแล้วอย่างชัดเจนโดยไม่มีสิ่งใดปิดบังซ่อนเร้น

ลงชื่อ.....(ผู้วิจัย)

วันที่.....

หมายเหตุ : กรณีผู้เข้าร่วมการวิจัยไม่สามารถอ่านหนังสือได้ ให้ผู้ วิจัยอ่านข้อความในหนังสือยินยอมฯ นี้ให้แก่ผู้เข้าร่วมการวิจัย ฟังจนเข้าใจดีแล้ว และให้ผู้เข้าร่วมการวิจัยลงนามหรือพิมพ์ลายนิ้วหัวแม่มือรับทราบในการให้ความยินยอมดังกล่าวข้างต้นไว้ด้วย

APPENDIX D

LISTS OF CONTENT VALIDITY EXPERTS

List of five experts who validated content of measurements:

1. Associate Professor Dr. Jariyawat Kompayak
   Dean of Faculty of Nursing,
   Huachiew Charlemprakiet University

2. Assistant Professor Dr. Teeranuch Harnirattisai
   Associate Dean for Academic Affairs, Faculty of Nursing,
   Thammasat University, Rangsit Campus Office

3. Assistant Professor Dr. Kaysorn Sumpowthong
   Faculty of Public Health,
   Thammasat University, Rangsit Campus Office

4. Lecturer Dr. Apa Youngpradith
   Department of Public Health Nursing, Faculty of Nursing,
   Mahidol University

5. Lecturer Dr. Wannipa Asawachaisuwikrom
   Department of Community Nursing, Faculty of Nursing,
   Burapha University

APPENDIX E

LISTS OF INSTRUMENT TRANSLATIONS

List of translator for the Sense of Neighborhood Scale and the Neighborhood Environment Walk ability Scale from Thai version to English version

Assistant Professor Dr. Sakul Changmai.
Graduate School, Christian University.

List of experts who identified the conceptual and linguistic inaccuracies between the original version of measurements and back translated version of measurements.

1. Dr. Cerin Ester (The NEWS-A developer)
   Research Assistant Professor / Honorary Assistant Professor
   Institute of Human Performance, UHK

2. Dr. Jenny Powers (The Sense of Neighborhood Scale developer)
   Australian Longitudinal Study on Women's Health
   Research Centre for Gender Health and Ageing
   University of Newcastle, Callaghan, NSW

APPENDIX F

INSTRUMENTS

THE DEMOGRAPHIC QUESTIONNAIRE

(แบบสัมภาษณ์ข้อมูลส่วนบุคคล)

Direction: Please check ✓ in the box or write down the answers in the bank

1. Gender Male Female

2. Age……years……..months

3. Religious…….

4. Height…….Centimeters

5. Weight…….Kilograms

6. Marital status

  Single Divorced

  Married, living with spouse Married, living with no spouse

  Widowed

7. Education

  No education Secondary school (Mo5-Mo6)

  Primary school (Po1-Po4) Vocational school

  Primary school (Po5-Po6) Baccalaureate

  Secondary school (Mo1-Mo4) other please specify

8. Occupation

  No occupation now, please specify your previous occupation……..

  Yes, please specify your occupation now…….

  Your work are…….hours/day……days/week

9. Income……..Baht per month

(Please specify the sources of money and the amount)

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18. Did you have any close relatives in this community or nearby one?

  no yes

THE DEMOGRAPHIC QUESTIONNAIRE
(แบบสัมภาษณ์ข้อมูลส่วนบุคคล)

คำชี้แจง: โปรดให้ข้อมูลเกี่ยวกับตัวท่าน โดยเติมคำหรือตัวเลขลงในช่องว่าง หรือ ทำเครื่องหมาย √ ข้อที่เป็นคำตอบ

1. เพศ 1) ชาย 2) หญิง
2. อายุ _____ ปี_____เดือน
3. ศาสนา_____
4. ความสูง _____ เซนติเมตร
5. น้ำหนัก _____กิโลกรัม
6. สถานภาพสมรส
   1) โสด
   2) คู่
   3) หม้าย
   4) หย่า
   5) แยก
7. ระดับการศึกษาสูงสุด
   1) ไม่ได้เรียนหนังสือ
   2) ประถมศึกษาต้น
   3) ประถมศึกษาปลาย
   4) มัธยมศึกษาต้น
   5) มัธยมศึกษาปลาย
   6) ปวช. ปวส./อนุปริญญา
   7) ปริญญาตรี
   8) อื่นๆ โปรดระบุ……..
8. อาชีพ
   1) ไม่มีงานทำขณะนี้ โปรดระบุงานที่เคยทำก่อนนี้ …….
   2) มีงานทำ โปรดระบุ ……
      จำนวน……..ชั่วโมงต่อวัน จำนวน……..ชั่วโมงต่อสัปดาห์
9. รายได้ของท่าน……. บาทต่อเดือน (โปรดระบุแหล่งที่มาและจำนวน)……
   .
   .
   .
18. ท่านมีเพื่อนสนิทที่อาศัยอยู่ในชุมชนนี้ หรือบริเวณใกล้เคียงหรือไม่
   1) ไม่มี
   2) มี

CHULA MENTAL TEST
(แบบทดสอบสภาพจิตจุฬา)

1. How old are you?
   ( ) 0. cannot answer ( ) 1. can answer
2. What time is it?
   ( ) 0. cannot answer ( ) 1. can answer
3. Registration of “Umbrella, Pan, and Door”
   ( ) 0. cannot answer ( ) 1. can answer 1 thing
   ( ) 2. can answer 2 things ( ) 3. can answer 3 things
4. What is this month?
   ( ) 0. cannot answer ( ) 1. can answer
5. Who is he/she? (two persons)
   ( ) 0. cannot answer ( ) 1. can answer 1 person
   ( ) 2. can answer 2 persons
6. How many kilograms are there in one tang of rice? (Thai measure)
   ( ) 0. cannot answer ( ) 1. can answer
7. Follow command ‘cap your hands 3 times and then cross your arms or ‘hit floor/ table 3 times and then raise your hand’
   ( ) 0. cannot do ( ) 1. can do
8. Proverb’ Nee suea pa cho-ra-ke’ (Escape from a tiger and meet a crocodite)
   ( ) 0. cannot answer ( ) 1. can answer

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13. Substract 3 from 20 for 3 times
   ( ) 0. cannot answer ( ) 1. can answer 1 time
   ( ) 2. can answer 2 times ( ) 3. can answer 3 times

CHULA MENTAL TEST

(แบบทดสอบสภาพจิตจุฬา)

1. ปีนี้คุณอายุเท่าไร

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้

2. ขณะนี้กี่โมง (อาจตอบคลาดเคลื่อนได้ 1 ชั่วโมง)

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้

3. ผู้สัมภาษณ์พูดคำว่า “ร่ม กระทะ ประตู ” ให้ฟังชัด ๆ 2 ครั้ง แล้วให้ผู้ถูกสัมภาษณ์พูดตาม (ชื่อที่ถูก 1 ชื่อ = 1 คะแนน)

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้ 1 ชื่อ

( ) 2. ตอบได้ 2 ชื่อ ( ) 3. ตอบได้ 3 ชื่อ

4. เดือนนี้เดือนอะไร

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้

5. คนนั้นเป็นใคร

(ให้ถามถึงบุคคล 2 คน เช่น แพทย์ พยาบาล หรือบุคคลใกล้เคียง)

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้ 1 ชื่อ

( ) 2. ตอบได้ 2 ชื่อ/

6. ข้าว 1 ถังมีกี่ลิตร / กี่กิโลกรัม (20 ลิตร หรือ 15 กิโลกรัม)

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้

7. ให้ผู้ถูกทดสอบทำตามคำสั่ง ที่จะบอกต่อไปนี้ “ให้ตบมือสามที แล้วกอดอก”

( ) 0. ทำตามไม่ได้ ( ) 1. ทำตามได้

8. สุภาษิตที่ว่า “หนีเสือปะจระเข้” หมายความว่าอย่างไร

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้

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13. บอกให้ผู้ถูกสัมภาษณ์ ลบเลขที่ละ 3 จาก 20 ทั้งหมด 3 ครั้ง

(20-3 =17, 17-3= 14, 14-3= 11)

( ) 0. ตอบไม่ได้ ( ) 1. ตอบได้ 1 ครั้ง

( ) 2. ตอบได้ 2 ครั้ง ( ) 3. ตอบได้ 3 ครั้ง

THE MODIFIED PHYSICAL ACTIVITY QUESTIONNAIRE

FOR OLDER THAI ADULTS

(แบบสอบถามกิจกรรมการเคลื่อนไหวออกแรงและการออกกำลังกายสำหรับผู้สูงอายุไทยในชุมชน)

Direction: This questionnaire is about activities that you may have done in the past 7 days. Please revise the activities you did in the past 7 days and then:

Step I: If you did the activity

a) Check (×) the **"Yes"** box.

b) Think about **"how many** times" **in the past 7 days** you did it, and write your response in the space provided.

c) Check (×) how many **"total hours"** in the past 7 days you did the activity (Please check the number of total hours closed to the whole number).

Step II: If you did not do the activity, please check (×) "**No**" and turn to the next item.

In the past 7 days, did you…..	How many TOTAL hours a week did you usually do it?					
1. Take care other people (Children, elderly, patient, or disable person). For example, - cleaning, feeding, serving food and milk - take other person to walk for pleasure or exercise □ Yes How many TIMES a week □ No	0-1 hours	More Than 1 to 3 hours	More Than 3 to 5 hours	More than 5 to7 hours	More than 7 to 9 hours	More than 9 hours
42. Do other types of physical activity not previously mentioned (Please specify)? □ Yes How many TIMES a week □ No	0-1 hours	More than 1 to 3 hours	More than 3 to 5 hours	More than 5 to7 hours	More than 7 to 9 hours	More than 9 hours

THE MODIFIED PHYSICAL ACTIVITY QUESTIONNAIRE

FOR OLDER THAI ADULTS

(แบบสอบถามกิจกรรมการเคลื่อนไหวออกแรงและการออกกำลังกายสำหรับผู้สูงอายุไทยในชุมชน)

ต่อไปนี้เป็นคำถามเกี่ยวกับกิจกรรมต่าง ๆ ที่ท่านได้ทำไปแล้ว ในระยะ 7 วันที่ผ่านมา

คำชี้แจง ขอให้ท่านทบทวนว่าในระยะ 7 วันที่ผ่านมา ท่านมีการเคลื่อนไหวออกแรงและการออกกำลังกายในแต่ละวันอย่างไรบ้าง แล้วตอบแบบสอบถามตามขั้นตอนดังนี้

ขั้นตอนที่ 1 ถ้าท่านได้ทำกิจกรรมนั้นๆ

- ให้ทำเครื่องหมายกากบาท (×) ในช่องข้อความ “ทำ”
- เติมจำนวนครั้งต่อสัปดาห์ที่ท่านได้ทำกิจกรรมดังกล่าวลงในช่องว่าง
- ทำเครื่องหมาย × ให้ตรงกับจำนวนชั่วโมงทั้งหมดที่ท่านได้ทำกิจกรรมในระยะ 7 วันที่ผ่านมา

ขั้นตอนที่ 2 ถ้าท่านไม่ได้ทำกิจกรรมนั้นๆ

- ให้ทำเครื่องหมายกากบาท (×) ในช่องข้อความ “ไม่ได้ทำ”
- ให้ข้ามไปตอบข้อต่อไป

ใน 7 วันที่ผ่านมา ท่านได้....	รวมจำนวนชั่วโมงทั้งหมดที่ท่านได้ทำใน 7 วันที่ผ่านมา					
1. ดูแลผู้อื่น (โปรดระบุ ประเภท และจำนวน……) - ดูแลทำความสะอาด เช่น อาบน้ำ แต่งตัว - ป้อนอาหาร น้ำ เครื่องดื่ม - พาไปเดินเล่น ☐ ทำ รวมจำนวน.....ครั้งต่อสัปดาห์ ☐ ไม่ได้ทำ	0 - 1 ชั่วโมง	มากกว่า 1 ถึง 3 ชั่วโมง	มากกว่า 3 ถึง 5 ชั่วโมง	มากกว่า 5 ถึง 7 ชั่วโมง	มากกว่า 7 ถึง 9 ชั่วโมง	มากกว่า 9 ชั่วโมง
42.ทำกิจกรรมชนิดอื่นนอกเหนือจากที่กล่าวมา (ระบุประเภท) ☐ทำ รวมจำนวน.....ครั้งต่อสัปดาห์ ☐ไม่ได้ทำ	0 - 1 ชั่วโมง	มากกว่า 1 ถึง 3 ชั่วโมง	มากกว่า 3 ถึง 5 ชั่วโมง	มากกว่า 5 ถึง 7 ชั่วโมง	มากกว่า 7 ถึง 9 ชั่วโมง	มากกว่า 9 ชั่วโมง

CODE BOOK FOR THE MODIFIED PHYSICAL ACTIVITY QUESTIONNAIRE FOR OLDER THAI ADULTS

Variable label	Item No.	Coding Algorithms
Energy expenditure/week in all physical activities		For each activity 1. Create new duration variables or total hour per week for each activity recorded as follow: 1=0.5, 2=2, 3=4, 4= 6, 5=8, 6= 10; if duration variable is not answered=0 Duration is hours/week. 2. For each recoded duration variable, create energy expenditure per week variable for each activity by multiplying total hour per week (no.1) by corresponding MET value in appendix E. 3. Sum energy expenditure per week variables across activities to create energy expenditure/week
Energy expenditure/week in low intensity physical activities	2, 3, 6, 7, 10, 11,12, 14,18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 33, 35, 38, 41	Sum as above, subset of activities with MET values 0 to 2.9
Energy expenditure/week in vigorous intensity physical activities	16, 30	Sum as above, subset of activities with MET values ≥ 6

Modified from Visuthipanich, V. (2009). Physical activity questionnaire development and testing among elderly community- dwelling Thais. *Thai Journal of Nursing Research, 13*(4), 249-266.and Ainsworth, B. E., Haskell, W. L., White, M. C., Irwin, M. L., Swartz, A. M., Strath, S. J. & et al. (2000). Compendium of physical activities: an update of activity codes and MET intensities. *Medicine & Science in Sports & Exercise, 32*(9), Suppl., S498-S516.

SUMMARY OF WEIGHTS FOR SELECTED ITEMS OF PHYSICAL ACTIVITY FOR OLDER THAI ADULTS
(สรุปค่าพลังงานที่ใช้สำหรับกิจกรรมต่าง ๆ ของผู้สูงอายุไทย)

No.	Questionnaire content	Activities	Metabolic Weight
1	Take care others, such as children, elderly, patient, and disability	Average of activities: - Carrying small children -Child care-sitting/kneeling-dressing, bathing, grooming, feeding, occasional lifting of child-light effort - Elder care, disabled adults	 3.0 2.5 4.0
2	Prepare food	Average of activities: - Cooking or food preparation Serving food, settling table	2.5
3	Do light work around the house	Light cleaning with moderate effort - Dishes washing - Ironing - Cleaning	2.5
.			
.			
.			
.			
13	Transportation	Average of activities Riding in a car or bus Automobile driving	1.0 2.0

Modified from Visuthipanich, V. (2009). Physical activity questionnaire development and testing among elderly community- dwelling Thais. *Thai Journal of Nursing Research, 13*(4), 249-266. and Ainsworth, B. E., Haskell, W. L., White, M. C., Irwin, M. L., Swartz, A. M., Strath, S. J. & et al. (2000). Compendium of physical activities: an update of activity codes and MET intensities. *Medicine & Science in Sports & Exercise, 32*(9), Suppl., S498-S516.

THE PHYSICAL ACTIVITY SELF EFFICACY QUESTIONNAIRE

(แบบสอบถามการรับรู้สมรรถนะด้านการทำกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุ)

Direction: Please rate how sure that you can perform your physical activity under various situations. Physical activity refers to all activities in daily life comprising occupational, household, transportation and leisure time (exercise, sport and recreation) activity. The degree of confidence ranging from 0 (cannot do at all) to 10 (certain can do).

Situation	**Degree of confidence**										
	0	1	2	3	4	5	6	7	8	9	10
1) you could perform physical activity/ exercise even if when you were tired											
2) you could perform physical activity/ exercise even if when you had to perform alone											
3) you could perform physical activity/ exercise even if when you felt anxious or sad											
12) you could perform physical activity/ exercise even if when this activity is difficult											

THE PHYSICAL ACTIVITY SELF EFFICACY QUESTIONNAIRE
(แบบสอบถามการรับรู้สมรรถนะด้านการทำกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุ)

คำชี้แจง แ บบสัมภาษณ์ชุดนี้มีวัตถุประสงค์เพื่อต้องการทราบความมั่นใจของผู้สูงอายุในการทำกิจกรรมการเคลื่อนไหวออกแรง ภายใต้สถานการณ์ต่าง ๆ ซึ่ง กิจกรรมการเคลื่อนไหวออกแรง หมายถึง กิจกรรมการเคลื่อนไหวร่างกายที่มีผลทำให้เกิดการใช้พลังงานเพิ่มจากภาวะพัก หากกระทำอย่างสม่ำเสมอด้วยระดับการออกแรงที่เหมาะสมจะมีผลดีต่อสุขภาพ กิจกรรมเหล่านี้ประกอบด้วย กิจกรรมที่เกี่ยวข้องกับการทำงานบ้าน งานอาชีพ การเดินทาง และงานอดิเรก เช่น การออกกำลังกาย และนันทนาการ

คำถามต่อไปนี้ต้องการจะทราบว่า หากมีสถานการณ์ต่อไปนี้เกิดขึ้น ท่านมีความ มั่นใจมากน้อยเพียงใดที่จะเคลื่อนไหวออกแรง/ ออกกำลังกาย โดยในตารางต่อไปนี้ ด้านซ้ายจะเป็นสถานการณ์ที่อาจขัดขวางการเคลื่อนไหวออกแรง ด้านขวาจะเป็นระดับความ มั่นใจ ซึ่งเรียงลำดับตั้งแต่ “ไม่เชื่อมั่นเลยว่าจะทำได้” หรือ 0 ไปจนถึง “มั่นใจว่าจะทำได้อย่างแน่นอน” หรือ 10 โดยให้ท่านทำเครื่องหมาย √ ลงในช่องตามระดับความมั่นใจของท่านในแต่ละสถานการณ์

สถานการณ์	ระดับความมั่นใจที่จะทำ กิจกรรมการเคลื่อนไหวออกแรง / ออกกำลังกาย										
	0	1	2	3	4	5	6	7	8	9	10
1. ท่านสามารถทำกิจกรรมการเคลื่อนไหวออกแรง/ ออกกำลังกายได้ แม้จะรู้สึกเหนื่อย											
2. ท่านสามารถทำกิจกรรมการเคลื่อนไหวออกแรง/ ออกกำลังกายได้ แม้ต้องทำโดยลำพัง											
3. ท่านสามารถทำกิจกรรมการเคลื่อนไหวออกแรง/ ออกกำลังกายได้ แม้มีเรื่องเครียด ไม่สบายใจ หรือเศร้าใจ											
12. ท่านสามารถทำกิจกรรมการเคลื่อนไหวออกแรง/ ออกกำลังกายได้แม้กิจกรรมนั้นมีความยากลำบาก											

THE SOCAIL SUPPORT FOR PHYSICAL ACTIVITY
(แบบสอบถาม การสนับสนุนทางสังคมด้านการทำกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุ)

Direction: Please indicate if you have ever got the following support from your family and your friends to perform physical activity. Physical activity refers to all activities in daily life comprising occupational, household, transportation and leisure time (exercise, sport and recreation) activity.

Item	Family			Friends		
	Never	Sometime	Often	Never	Sometime	Often
1) encouraged you to perform physical activity/ exercise						
2) admired you when performing physical activity/ exercise						
3) complained you when performing physical activity/ exercise						
4)listened to you and gave you an encouragement when you had the problem						
5) provided equipment or facilities for performing physical activity/ exercise						
11) gave you information regarding benefits and kinds of performing physical activity/ exercise						

THE SOCAIL SUPPORT FOR PHYSICAL ACTIVITY
(แบบสอบถาม การสนับสนุนทางสังคมด้านการทำกิจกรรมการเคลื่อนไหวออกแรงของผู้สูงอายุ)

คำชี้แจง แบบสัมภาษณ์ชุดนี้มีวัตถุประสงค์ เพื่อต้องการทราบว่าในทุก ๆ 1 สัปดาห์ บ่อยครั้งแค่ไหนที่สมาชิกในครอบครัว และ / หรือ เพื่อนของท่าน ได้ปฏิบัติ หรือทำสิ่งต่าง ๆ เพื่อสนับสนุนให้ท่านได้ ทำกิจกรรมการเคลื่อนไหวออกแรง ซึ่ง กิจกรรมการเคลื่อนไหวออกแรง หมายถึง กิจกรรมการเคลื่อนไหวร่างกาย ที่มีผลทำให้เกิดการใช้พลังงานเพิ่มจากภาวะพัก หากกระทำอย่างสม่ำเสมอ ด้วยระดับการออกแรงที่เหมาะสม จะมีผลดีต่อสุขภาพ กิจกรรมเหล่านี้ ประกอบด้วย กิจกรรมที่เกี่ยวข้องกับการทำงานบ้าน งานอาชีพ การเดินทาง และงานอดิเรก เช่น การออกกำลังกาย และนันทนาการ

โปรดทำเครื่องหมาย / ลงในช่องที่ตรงกับความเป็นจริงของท่านมากที่สุดเพียงข้อเดียว โดยมีเกณฑ์ในการเลือกคำตอบดังนี้

ไม่เคยปฏิบัติเลย หมายถึง ครอบครัวและ/ หรือเพื่อน ไม่เคยปฏิบัติ หรือทำสิ่งต่าง ๆ ที่เป็นการสนับสนุนให้ท่านได้เคลื่อนไหวออกแรง/ ออกกำลังกายเลย

ปฏิบัติเป็นบางครั้ง หมายถึง ครอบครัวและ/ หรือเพื่อนได้ปฏิบัติหรือทำสิ่งต่างๆ เพื่อสนับสนุนให้ท่านได้เคลื่อนไหวออกแรง/ ออกกำลังกาย 1-2 ครั้ง ต่อสัปดาห์

ปฏิบัติบ่อยครั้ง หมายถึง ครอบครัวและ/ หรือเพื่อนได้ปฏิบัติ หรือทำสิ่งต่าง ๆ เพื่อสนับสนุนให้ท่านได้เคลื่อนไหวออกแรง/ ออกกำลังกาย 3-5 ครั้งต่อสัปดาห์

ข้อความ	สมาชิกในครอบครัว			เพื่อน		
	ไม่เคย	บางครั้ง	บ่อย	ไม่เคย	บางครั้ง	บ่อย
1. กระตุ้นเตือนให้ท่านได้ทำกิจกรรมการเคลื่อนไหวออกแรง/ ออกกำลังกาย						
2. ชมเชยท่านเมื่อท่านได้ทำกิจกรรมการเคลื่อนไหวออกแรง/ ออกกำลังกาย						
11. ให้ข้อมูลเกี่ยวกับประโยชน์และชนิดของการทำกิจกรรมการเคลื่อนไหวออกแรง/ การออกกำลังกาย						

THE NEIGHBORHOOD ENVIRONMENT SCALE

(แบบสอบถามการรับรู้เกี่ยวกับสิ่งแวดล้อมละแวกบ้าน)

Instruction: Please mark √ on the most appropriate answer regarding to you and your neighborhood

A. Service Accessibility (Spend about 10-15 minutes for walking from your home)

	Strongly disagree	**Somewhat disagree**	**Somewhat agree**	**Strongly agree**
1) It is not far that you can walk from your home to stores such as grocery, drug store, fresh fruit and vegetable market, or supermarket				

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F. Crime

	Strongly disagree	**Somewhat disagree**	**Somewhat agree**	**Strongly agree**
1)				
2)				
3) Crime in your neighborhood makes it unsafe to walk at night				

THE NEIGHBORHOOD ENVIRONMENT SCALE

(แบบสอบถามการรับรู้เกี่ยวกับสิ่งแวดล้อมละแวกบ้าน)

คำชี้แจง อยากทราบการรับรู้หรือความคิดของท่านเกี่ยวกับสิ่งแวดล้อมละแวกบ้าน
โปรดทำเครื่องหมาย √ ลงบนคำตอบที่เหมาะสมที่สุดเกี่ยวกับท่านและละแวกบ้านของท่าน

ก. การเข้าถึงแหล่งบริการ (ใช้เวลาเดินประมาณ 10-15 นาทีจากบ้านของท่าน)

	1	2	3	4
1) ท่านสามารถเดินไปยังร้านค้าต่าง ๆ ที่ไม่ไกลจากบ้านของท่านได้ เช่น ตลาดนัด ร้านขายของชำ ร้านขายยา ร้านขายผัก ผลไม้	ไม่เห็นด้วยอย่างยิ่ง	ไม่ค่อยเห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วยอย่างยิ่ง

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ช. อาชญากรรม

	1	2	3	4
3) ท่านรู้สึกไม่ปลอดภัยจากอาชญากรรม หากต้องเดินทางในละแวกบ้านของท่านในเวลากลางคืน	ไม่เห็นด้วยอย่างยิ่ง	ไม่ค่อยเห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วยอย่างยิ่ง

THE SENSE OF COMMUNITY SCALE
(แบบสอบถามความรู้สึกเป็นส่วนหนึ่งของชุมชน)

Direction: Please check ✓ in the box that best applies to you and your neighborhood.

Item	Level of response				
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1) You have a lot in common with people in your neighborhood					
2) You are good friend with your Neighbor					
3) You generally trust your neighbor; for example when you are not at home, you ask your neighbor to look after your property					
9) You and your neighbors get together for activities such as activity for community problem solving					

THE SENSE OF COMMUNITY SCALE
(แบบสอบถามความรู้สึกเป็นส่วนหนึ่งของชุมชน)

คำชี้แจง โปรดทำ เครื่องหมาย √ ลงในช่องที่ตรงกับท่านและชุมชนที่ท่านอาศัยอยู่มากที่สุด

หัวข้อ	ระดับความคิดเห็น				
	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	เฉย ๆ	เห็นด้วย	เห็นด้วยอย่างยิ่ง
1)ท่านกับเพื่อนบ้านของท่านมีความสนใจอะไรคล้าย ๆ กัน (เช่น มีความสนใจในการทำกิจกรรมทางสังคม คล้ายกัน)					
2) ท่านเป็นเพื่อนที่ดีกับเพื่อนบ้านของท่าน					
3) โดยปกติท่านไว้ใจเพื่อนบ้านของท่าน เช่น เมื่อท่านไม่อยู่บ้าน ท่านให้เพื่อนบ้านช่วยดูแลบ้านให้					
9) ท่านและเพื่อนบ้านของท่าน รวมกลุ่มเพื่อทำกิจกรรมร่วมกัน เช่น รวมกลุ่มเพื่อแก้ปัญหาของชุมชน					

THE SHORT FORM-36 HEALTH SURVEY (SF36) (VERSION 2)

(THE PHYSICAL HEALTH COMPONENT)

(แบบประเมินสุขภาพกาย)

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Direction For each of the following questions, please mark ✓ in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
O	O	O	O	O

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5. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
O	O	O	O	O

6. How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't Know	Mostly false	Definitely false
6.1					
6.2					
6.3					
6.4 My health is excellent.					

THE SHORT FORM-36 HEALTH SURVEY (SF36) (VERSION 2)

(THE PHYSICAL HEALTH COMPONENT)

(แบบประเมินสุขภาพกาย)

คำชี้แจง โปรดขีดเครื่องหมาย / ในช่อง ที่ท่านเห็นว่าตรงกับลักษณะของท่านมากที่สุด

1. ในภาพรวม ท่านคิดว่าสุขภาพของท่านเป็นอย่างไร

ดีเยี่ยม	ดีมาก	ดี	ปานกลาง	เลว
O	O	O	O	O

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5. ในช่วง 4 สัปดาห์ที่ผ่านมา อาการปวดรบกวนการทำงาน (ทั้งที่ทำงานและที่บ้าน) มากน้อยเพียงใด?

ไม่รบกวนเลย	รบกวนเล็กน้อย	รบกวนปานกลาง	รบกวนค่อนข้างมาก	รบกวนมาก
O	O	O	O	O

6. ข้อความต่อไปนี้ตรงกับสุขภาพของท่านหรือไม่?

	ถูกต้องที่สุด	ส่วนใหญ่ถูกต้อง	ไม่ทราบ	ส่วนใหญ่ไม่ถูกต้อง	ไม่ถูกต้อง
6.4 มีสุขภาพดีเยี่ยม					

SCORING FOR SF36 (VERSION 2)

(วิธีการคิดคะแนน SF – 36 V2)

Four Subscales composed of

	Numbers of Items
1.Physical functioning	10 (Item 2)
2. Role physical	4 (Item 3)
3. Bodily pain	2 (Item 4 and 5)
4. General health	5 (Item 1 and 6)

1. Physical Functioning

	Yes, limited a lot	Yes, limited a little	No, not limited at all
1.1 Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	0	50	100
1.10 Bathing or dressing yourself.	0	50	100

Mean Score= Sum score/ 10

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6. How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't Know	Mostly false	Definitely false
6.1					
6.4 My health is excellent	100	75	50	25	0

THE HEALTH RELATED SELF REPORTED (HRSR) SCALE
: THE DIAGNOSTIC SCREENING TEST
FOR DEPRESSION IN THAI POPULATION

Direction: Please check√ in front of the items most correspond to your health or feelings on behaviors during two week periods.

Items	**Frequency**			
	Never	Sometimes (average weekly)	Rather frequent (2-3 days per week)	Frequent (almost everyday per week)
1. Poor appetite/anorexia				
2. Cannot sleep or need sleeping pills.				
3. Easily fatigue or low energy				
4. Worry or over concern				
19. People said I look worried or sad				

20. Have attempted suicide ☐ ever ☐ never

Total Score……..

THE HEALTH RELATED SELF REPORTED (HRSR) SCALE: THE DIAGNOSTIC SCREENING TEST FOR DEPRESSION IN THAI POPULATION

(แบบสอบถามปัญหาสุขภาพ: แบบวัดด้วยตนเองเพื่อตรวจวัดหาโรคซึมเศร้าในประชากรไทย)

คำชี้แจง โปรดขีด เครื่องหมาย / หน้าข้อที่ตรงกับสุขภาพ และความรู้สึกของท่าน ในช่วง 2 สัปดาห์นี้ (บ่อย ๆ = เกือบทุกวัน, ค่อนข้างบ่อย = 2-3 วัน/ สัปดาห์, บางครั้ง = น้อยกว่าสัปดาห์ละครั้ง)

หัวข้อ	ความถี่ของความรู้สึกในช่วง 2 สัปดาห์นี้			
	บ่อย ๆ	ค่อนข้างบ่อย	บางครั้ง	ไม่เลย
1. รู้สึกเบื่ออาหาร				
2. นอนไม่หลับหรือต้องใช้ยานอนหลับ				
3. รู้สึกอ่อนเพลีย เหนื่อยง่าย				
4. คิดมาก กังวล				
19. คนอื่นทักว่าดูเครียด ซึมหรือเศร้าหมอง				

20. พยายามฆ่าตัวตาย ☐ เคย ☐ ไม่เคย

รวมคะแนน……...

APPENDIX G

LINEARITY TESTING

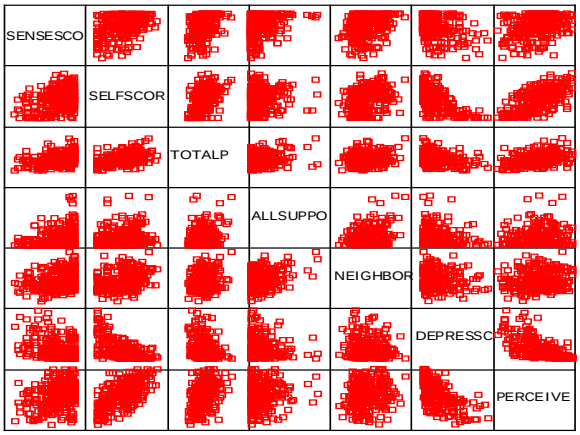

Figure G1: Scatter Plot Matrix of the Study Variables (n=258)

Note:

SENSESCO = A Sense of Community

SELFSCOR = Physical Activity Self Efficacy

TOTALP = Total Physical Activity

ALLSUPPO = Social Support

NEIGHBOR = Neighborhood Environment and Facilities

PERCEIVEH = Perceived Mental Health

PERCEIVEP = Perceived Physical Health

HOMOSCEDASTICITY TESTING

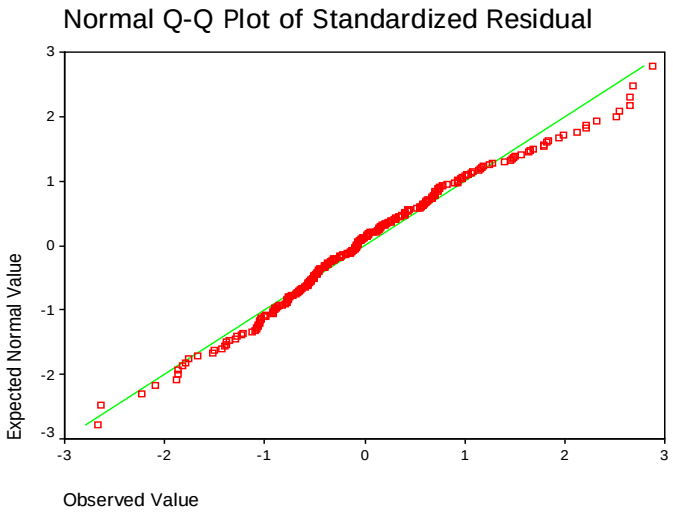

Figure G2: Normal Q-Q Plot for Standardized Residual (n=258)

BIOGRAPHY

NAME	Mrs. Phachongchit Kraithaworn
DATE OF BIRTH	9 October 1967
PLACE OF BIRTH	Bangkok, Thailand
INSTITUTIONS ATTENDED	Mahidol University, (1985-1989) Bachelor of Science (Nursing & Midwifery) (Second Class Honor) Chulalongkorn University, (1993-1995) Master of Science (Mental Health) Mahidol University, (2005-2010) Doctor of Philosophy (Nursing)
SCHOLARSHIP	The Commission of Higher Education, Ministry of Education
RESEARCH GRANT	Thailand Nursing Council
POSITION & OFFICE	-
HOME ADDRESS	188/33 (68) Phanason Villa Phase II, Soi Chalermprakiet 48, Chalermprakiet Lo9 Road Dogmai, Phawet, Bangkok, 10250, Thailand
PHONE	Home: (662) 347-2029 Mobile: (6681) 554-8605
E-MAIL	phachong@yahoo.com phachong@hotmail.com