

HOW DOES SELF-
RATED HEALTH DIFFER AMONG OLDER MEN AND WOMEN?; EVIDENCE
FROM VIETNAM.

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ด็ก ดัง เล : การประเมินภาวะสุขภาพด้วยตนเอง มีความแตกต่างระหว่างผู้สูงอายุชายหญิงอย่างไร: หลักฐานจากเวียดนาม.
(HOW DOES SELF-RATED HEALTH DIFFER AMONG OLDER MEN AND WOMEN?; EVIDENCE FROM VIETNAM.) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร. วิพรรณ
ประจวบเหมาะ, 63 หน้า.

การสูงอายุทางประชากรอย่างรวดเร็วในประเทศเวียดนาม ได้ส่งผลกระทบต่อผู้สูงอายุในหลายมิติ โดยเฉพาะอย่างยิ่งในด้านภาวะสุขภาพ การประเมินภาวะสุขภาพด้วยตนเอง (self-rated health) เป็นวิธีการหนึ่งที่สามารถแสดงให้เห็นภาพรวมของภาวะสุขภาพของประชากรสูงอายุ การศึกษาในครั้งนี้จะใช้ข้อมูลการสำรวจระดับประเทศจากโครงการการสำรวจประชากรสูงอายุในเวียดนาม (VNAS) ปีพ.ศ. 2554 โดยการศึกษาครั้งนี้จำกัดเฉพาะประชากรที่มีอายุตั้งแต่ 60 ปีขึ้นไป ประชากรสูงอายุที่ใช้ในการวิเคราะห์มีจำนวนทั้งสิ้น 2,549 ราย การศึกษาครั้งนี้วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและการวิเคราะห์ถดถอยโลจิสติก ผลการศึกษาพบว่า ผู้สูงอายุเพศหญิงมีส่วนที่ประเมินว่าตนมีภาวะสุขภาพไม่ดีสูงกว่าเพศชาย และเมื่อวิเคราะห์ด้วยการวิเคราะห์ถดถอยโลจิสติกพบว่า สำหรับผู้สูงอายุเพศชาย ปัจจัยที่เกี่ยวกับความพอเพียงของรายได้ การดื่มสุรา และการมีโรคประจำตัวมีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับการประเมินตนเองว่ามีสุขภาพไม่ดี ส่วนผู้สูงอายุเพศหญิงนั้น นอกจากปัจจัยที่กำหนดความสัมพันธ์กับการประเมินภาวะสุขภาพด้วยตนเองจะคล้ายคลึงกับเพศชายแล้ว ยังมีปัจจัยอื่นที่เกี่ยวข้องกับการประเมินว่ามีภาวะสุขภาพไม่ได้อย่างมีนัยสำคัญทางสถิติได้แก่ สถานภาพการทำงาน ระดับการศึกษา และภาคที่อยู่อาศัย ดังนั้น โครงการด้านสาธารณสุขในเวียดนามควรคำนึงถึงความแตกต่างทางเพศและควรเน้นในการกช้อค้นพบจากการศึกษาครั้งนี้สามารถนำไปใช้เป็นข้อเสนอแนะเชิงนโยบายในการส่งเสริมความอยู่ดีมีสุขของผู้สูงอายุโดยคำนึงถึงความแตกต่างทางเพศพร้อมทั้งคำนึงถึงปัจจัยต่างๆที่เกี่ยวข้องกับการประเมินภาวะสุขภาพด้วยตนเองของผู้สูงอายุที่ได้จากผลการศึกษาครั้งนี้ เพื่อพัฒนาความอยู่ดีมีสุขของประชากรสูงอายุในเวียดนาม

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The rapidly increasing of population aging in Vietnam poses far-reaching impacts on various aspects of older persons' life, especially their health status. Self-rated health can provide a holistic view of the health status of older population. The data for this study was utilized from a nationally representative survey, Vietnam National Aging Survey (VNAS) conducted in 2011. The sample of this study was restricted to population aged 60 and over. The final analytical sample of this study was 2,549 older persons. The study used descriptive statistics and binary logistic regression to analyze the data. The results indicated that the proportion of reporting poor and very poor health status was higher among women (68.4%) than men (57.0%). Results of the logistic regression analysis showed that, for men, perceived sufficiency of income, alcohol drinking, and chronic diseases were significantly associated with reporting poor health status. For women, besides having the same factors associated with Self-rated health as men, employment status, educational level, place of residence, and region were found to be strongly associated with poor self-rated health. Therefore, health-related programs with regards to gender-based should directly focus on all the factors identified in this paper to improve the overall well-being of the aging population of Vietnam.

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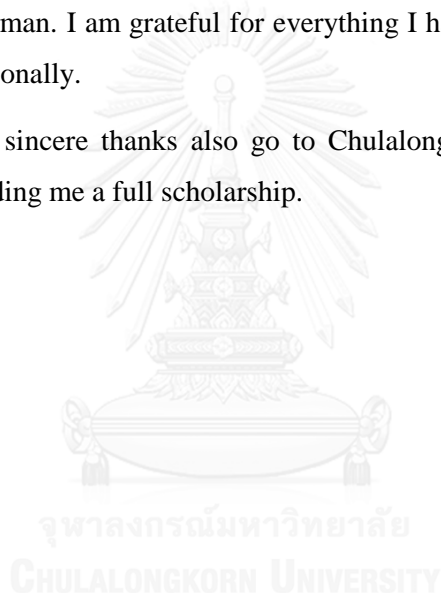
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ABBREVIATION

OPs:	Older persons
SRH:	Self-rated Health
GSO:	General Statistics Office
WHO:	World Health Organization
UNFPA:	The United Nation Population Fund
UN:	United Nation
VNHS:	Vietnam National Health Survey
ADL:	Activities in Daily Living
IADL:	Instrumental Activities in Daily Living
WB:	World Bank
SES:	Social Economic Status
DALYs:	Disability – Adjusted Life Years
VNAS:	Vietnam Aging Survey
ISMS:	Institute of Social and Medical Studies
IRC:	Indochina Research and Consulting
SAGE:	Study on Global Aging and Adult Health
PHS:	Population and Household Survey
VHLSS:	Vietnam Household Living Standard Survey
PPS:	Probability Proportional to Size
COPD:	Chronic Obstructive Pulmonary Disease
OR:	Odds Ratios
CI:	Confident Interval
VIF:	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

1.1. Background

Population aging is a phenomenon that is inevitable in most of the regions and countries in the world. Although the speed of population aging varies by levels of development, the fastest speed of population aging is more likely to occur in developing countries. As a consequence, the aged population is projected to rise substantially from 901 million in 2015 to around 2.1 billion in 2050 (UN., 2015). Increasing longevity is an achievement of human beings, but population aging also generates profound impacts on society, economics, and culture with respect to individuals, families, communities, and the globe.

Rapid demographic transition in Vietnam during the past three decades has led to a rapid shift in age structure. Data in Table 1 shows that the number of older population has increased over twofold during the forty-year period (1979-2009), while the proportion of the older people (OPs) has increased from 6.9 percent to 9 percent.

Table 1: Population structure of Vietnam aged 60 and above from 1979 to 2009

Year	Population aged 60 and above (in million)	% of population aged 60 and above of total population
1979	3.71	6.9
1989	4.64	7.2
1999	6.19	8.1
2009	7.72	9.0

Source: GSO in 1979, 1989, 1999 and 2009.

Vietnam entered the “aging stage” in 2011, as the share of aged population accounted for more than 10 percent of the total population. In addition, the proportion of OPs in Vietnam has been projected to reach 17 percent in 2030 and 31 percent of total population in 2050. As a result, Vietnam will be transformed from “aging” to “aged” society within 20 years as the aged population will account for more than 20 percent of the total population (UNFPA, 2011). The pace of aging in Vietnam is much faster than Thailand and Japan – these two countries are considered as the fastest aging societies in regions, which needed 22 and 26 years, respectively, to become an aged population (UNFPA, 2011).

Worldwide, the number of older women dominates that of older men. Globally, there are 84 and 61 men aged 60 and above and aged 80 and higher, respectively, for every 100 women in the same age categories (UNFPA., 2012). Vietnam is not an exception in this process; data from General Statistics Office (GSO) in 2009 show that there is a feminization trend in the aging of the population. The number of older women is higher than that of their male counterparts across all age groups. In other words, the more advanced age is, the higher the ratio of older women (Table 2). It has been indicated that older women are more vulnerable than older men in many aspects of life (Giang, 2010).

Table 2: Feminization of aging population in 2009

Age	Men	Women	Total population in million	Ratio Women/man
60-69	1.5	1.9	3.4	1.3
70-79	1.0	1.5	2.6	1.4
80+	0.449	0.9	1.3	2.0

Source: GSO 2010.

Under such a demographic phenomenon, the health status of the OPs is extremely important because the aging process is significantly associated with deterioration of health status and high chance of morbidity. Population aging poses serious policy challenges for many countries, especially those at low-income levels and developing countries. Moreover, health status is one of the significant factors in predicting the well-being of people in old age. Thus, in order to promote healthy aging, it is important to monitor health conditions regularly.

A rapidly aging population places huge demands on public services, especially for the healthcare system, in which the trend of increasing chronic disease and disability is widely prevalent. Indeed, as one of the fastest aging society in ASEAN, Vietnam is facing the challenges of epidemiological transition. The transition of disease patterns has been transformed from communicable to non-communicable diseases (Dam et al., 2010; Evan et al., 2007). Specifically, OPs in Vietnam are now facing a “twin morbidity burden” (UNFPA, 2011), meaning that in addition to suffering from diseases relating to physical deterioration with advancing age, they have been experiencing new diseases caused by changing socio-economic conditions resulting from economic growth. In addition, a previous study shows that presence of chronic disease is very common among OPs in Vietnam (Dam et al., 2010). Changes in lifestyles caused by social and demographic transition are found to cause various types of diseases, such as: diabetes, hypertension, cardiovascular, etc., as well as mental illnesses, such as stress and mental depression (Pham & Do, 2009). As a result, non-communicable diseases have become major causes of illness among OPs

in developing countries (Yach, Kellogg, & Voute, 2005). Such a morbidity trend is projected to be a dual burden in Vietnam in the coming decades (Pham & Do, 2009).

Although the prevalence of chronic disease is high in the older population, the accessibility of health care of OPs is still limited. Previous studies in Vietnam show that the weakness of the health care system and the cost of treatment are the main obstacles of accessing healthcare services (Q. A. Nguyen, Nguyen, & Phan, 2007; V. C. Nguyen, 2010). In particular, the cost of treatment in the older population is very high, around 7-8 times higher than that of children. This may be due to the long period for rehabilitation and palliative care (Evan et al., 2007; Pham & Do, 2009). In addition, despite facing many health risks, it appears that most OPs do not have full knowledge about disease prevention and treatment as well as having poor health behavior (Tran, 2010). For example, around 84 percent of OPs do not know the causes of high blood pressure and approximately 75 percent do not know how to prevent joint degradation. Thus, the health status of older population should be given more attentions otherwise health problems of OPs will not be controlled and mitigated, and health care for them will become a large and unavoidable financial burden.

Most of the previous research reveals that gender is a good predictive variable of health status of people in later years of life (Kalavar & Jamuna, 2011; Roy & Chaudhuri, 2008). In terms of health status, gender discrimination appears when people are aged (Moller, Fincher, & Thornhill, 2009). The vulnerability of older women has raised critical issues for the government's social programs to improve living standards (Helpage., 2007; UN., 2007). Simultaneous with the feminization phenomenon of old age, there have been growing concerns about the consequences of gender imbalance among policy makers in Vietnam. They have been concerned that older women might be more vulnerable to health problems than their male counterparts. This may be owing to the fact that women are more likely to have unfavorable socioeconomic status when they are young and tend to be widowed when they are aged (Giang & Pfau, 2007). It has been a general belief that older women tend to report their health status as being poorer than older men do, but yet live longer. This implies that women may, in fact, have better health status than reported (Demirchyan, Petrosyan, & Thompson, 2012; Molarius et al., 2012; N. Ng, P. Kowal, et al., 2010; Nawi Ng et al., 2010; Roy & Chaudhuri, 2008; Singh, Arokiasamy, Singh, & Rai, 2013; Teerawichitchainan, 2010). Those findings have raised a concern about how older men and women perceive their health status and what factors affect their perceptions on health issues. Furthermore, reports on social determinants of health of the World Health Organization (WHO) indicate that solving gender inequity is the only possible way to narrow the health gaps between countries and within countries (WHO., 2008). It suggests that women's empowerment is considered a key

measure to reduce gender differences in health status. Thus, it is essential to explain reasons that cause gender gaps in health status.

A simple single question on self-perceived health has been frequently used in aging studies and is considered as a global measurement of general health status. The association among self-rated health (SRH), socioeconomic background, chronic disease, and lifestyle risk behaviors has been explored in a number of studies on aging (Barry, Soulos, Murphy, Kasl, & Gill, 2013; Giang, 2008; Han, 2014; Hoang, Byass, Nguyen, & Wall, 2010; Kumar & Kumar, 2012; A. W. Nguyen et al., 2013; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; T. A. Khan & Flynn, 2015). However, the majority of these studies have been carried out in Western countries (Singh-Manoux et al., 2007); little is known about the patterns of SRH among men and women in developing country contexts (Hoang, Byass, & Wall, 2010). Moreover, most of studies on SRH of aging populations mainly focus on areas of predicting morbidity and mortality in later life, mental health, social contexts, socio-demographic status, physical health and quality of life (Han, 2014; Hoang, Byass, Nguyen, et al., 2010; Kumar & Kumar, 2012; A. W. Nguyen et al., 2013; Schnittker, 2005; Singh-Manoux et al., 2007; Wang & Satariano, 2007). Few studies have investigated the association between SRH and gender differences, especially in developing contexts.

To the best of my knowledge, there are only two studies that have examined the association between SRH and old age in Vietnam. A study by Minh, et al. aimed to describe the health status pattern of older population generally, focusing on difference in place of residence instead of gender differences. Moreover, the sample population came from a rural community named Bavi, thus, it may not be representative of the whole country (Hoang, Byass, Nguyen, et al., 2010). The second study examined the differences in health status between older men and women but the data utilized was from Vietnam National Health Survey in 2001-2002. This is obviously not a survey focused on the older population. Furthermore, the data period of this study is obsolete; therefore, it might not show real health conditions of OPs in Vietnam to date (Teerawichitchainan, 2010).

In this research, I focus on the association between SRH and the determining factors among the older population in a specific developing country – Vietnam – by using the most recent and large data sets that contain rich information on socio-demographic characteristics, chronic diseases, and lifestyle factors that could explain the differences in health status of men and women (Hoang, Byass, Nguyen, et al., 2010; Hoang, Dao, & Kim, 2008; Kumar & Kumar, 2012; Molarius et al., 2007; Singh et al., 2013). This study aims to provide comprehensive knowledge on the health

patterns and identify the determining factors associated with SRH between older men and women in Vietnam.

1.2. Research questions

The main research question of this study is: how does self-rated health differ among older men and women in Vietnam? In order to capture a clear relationship between these two variables, there are additional research questions as follows:

- Are there any differences in reporting poor health status among older men and women?
- To what extent do the demographic characteristics, socio-economic factors, lifestyle risk behaviors, and chronic diseases contribute to poor health-assessed among older men and women?

1.3. Objectives

The aim of this research is:

- To identify underlying factors that influence self-rated health of older men and women.
- To propose policy recommendations for OPs in Vietnam.

1.4. Research structure

This thesis comprises 6 chapters:

Chapter 1: Introduction

This chapter reviews the global aging situation as well as the situation in Vietnam. The chapter also provides research questions and the rationale for conducting the proposed study.

Chapter 2: Literature review

In this chapter, the application of self-rated health in aging studies and the association between self-rated health and gender are discussed. This chapter also reviews related theoretical frameworks and provides a comprehensive conceptual framework of this study. In addition, all explanatory variables that may have an effect on self-rated health among older men and women are also reviewed and synthesized in this chapter.

Chapter 3: Data and methodology

Detail information on data used in this study is presented. This chapter also includes methods of analysis and variable measurements.

Chapter 4: Findings of the study

Key research findings with comprehensive explanations are presented in this chapter.

Chapter 5: Discussion and conclusion

This chapter discusses major key findings of this study and current policies for older people in Vietnam. Summary of significances from the study, conclusion, and limitations of the study are also presented.

Chapter 6: Policy and recommendations for future research

Recommendation for future researches and policy recommendations relating to the key research findings in this study are proposed in this chapter.



CHAPTER 2

LITERATURE REVIEW

2.1. Self-rated health and its applications

Self-rated health (SRH) is considered a health measurement in which respondents report their own health status. There are several versions of SRH being used for health surveys. One of the versions asks about a respondent's general health ranging from "very good" to "very poor" as recommended by WHO and the EURO-REVES 2 group (Robin, Jagger, & Grp., 2003; WHO., 1996). Another version divides the rating scale into five levels from "excellent" to "poor". However, a previous study shows that there is not much difference in the results collecting from these two versions (Jurges, Avendano, & Mackenbach, 2008). In order to have a better indication, some of the previous research includes the time reference for the SRH, such as during the past seven days (Haseen, Adhikari, & Soonthorndhada, 2010). In this study, SRH is derived from a question asking about current health status of respondents as follows: "How would you rate your physical health at the present time? Would you say it is very good, good, fair, poor or very poor?"

SRH is a subjective evaluation of health status and has been considered the most widely used and useful measurements of health status in epidemiological and geriatric research (Kumar & Kumar, 2012; Schnittker, 2005). Studies of SRH on OPs have been well documented in Western populations for its simplicity. SRH has been found to be a strong, valid, and reliable independent variable for health outcomes. A number of previous studies have consistently indicated that SHR is a good measureable predictor of mortality and a variety of diseases (Han, 2014; Haseen et al., 2010; Khang & Kim, 2010; Singh-Manoux et al., 2007; Wang & Satariano, 2007). In addition, previous studies also reveal that SRH is strongly and significantly associated with morbidity, well-being and the quality of life of OPs (Hoang, Dao, Wall, Nguyen, & Byass, 2010; Latham & Peek, 2013; Mwanyangala et al., 2010; Ng, Hakimi, Byass, Wilopo, & Wall, 2010; A. W. Nguyen et al., 2013). Numerous studies have indicated that difficulties in activities in daily living (ADLs) or instrumental activities in daily living (IADLs) have a significant impact on an individual's health status. For example, those with difficulties in ADLs or IADLs have a higher probability of perceiving their health status as being poor as compared to those who are able to do all activities (Haseen et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; T. A. Khan & Flynn, 2015). In terms of gender-based inequality, although

considered one of important determinants of health status, the effects of ADLs and IADLs are mediating when social and psychological factors are included (Denton, Prus, & Walters, 2004).

SRH is also found to be determined by the demographic and socio-economic characteristics of OPs (Hoang, Byass, Nguyen, et al., 2010; Molarius et al., 2007; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013), while lifestyle risk behaviors (smoking and drinking alcohol) and chronic disease are found to be important determinants of health status in both genders (Demirchyan et al., 2012; Haseen et al., 2010; Molarius et al., 2007). The reason, is that SRH is an individual judgment, and the respondent may base their assessment on their socio-economic background and social norms (Latham & Peek, 2013). Therefore, SRH is a major measurable indicator which could explain different effects on health perception of older people. Furthermore, SRH is recommended as a standard section of health surveys (Robin et al., 2003; WHO., 1996), as well as a useful tool to screen risk diseases (May, Lawlor, Brindle, Patel, & Ebrahim, 2006).

Subjective health versus objective health measurements

Although objective physical health measurements, such as activities in daily living or instrumental activities in daily living make a great contribution to the decision making of subjective health perception (Haseen et al., 2010; A. W. Nguyen et al., 2013; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013), in fact, individuals with the presence of ADLs or IADLs could also perceive their health status to be as good as those without any disabilities. A study indicates that the impact on SRH depends on health status at the present time. For example, a positive affect may make a great contribution on reporting health if people are in good health (Schüz, Wurm, Schöllgen, & Tesch-Römer, 2011). Furthermore, the notion that SRH has a strong ability to predict mortality in older population has indicated that compared to ADLs and IADLs, OPs may be better at evaluating their “actual” health status.

2.2. Health inequalities in term of gender differences

Gender inequality in health

Gender has received great attention from scholars in examining the association with subjective health outcomes. However, there still has been a paradox between longevity and SRH among older men and women. Older women tend to report their health status as being poorer and consume more health utilizations than do older men, yet live longer. This implies that women may, in fact, have better health status than they report (Demirchyan et al., 2012; Molarius et al., 2012; N. Ng, P. Kowal, et al.,

2010; Nawi Ng et al., 2010; Roy & Chaudhuri, 2008; Singh et al., 2013; Teerawichitchainan, 2010). In fact, men, in most countries, have shorter lives than women, although is not true for all (Moller et al., 2009).

Gender is a measure of biological and social differences. It has been indicated that health inequalities in men and women could be reflected by biological and social factors (Austad, 2006; Moller et al., 2009). In terms of biological views, women live longer than men because they are naturally more robust than men across all age groups (Austad, 2006). In terms of social views, previous studies have suggested that differences in resources and income inequality (Molarius et al., 2012; Moller et al., 2009), or lifestyle risk health behaviors, such as smoking (Case & Paxson, 2005), between older men and women have made a great contribution on reporting health conditions. In this section, I will provide comprehensive information on two aspects of gender differences. Hypothesis differences in social circumstances, health vulnerability, and finding variations among men and women will be discussed first. Then the second aspect will deal with the mechanism of how an individual's health status is influenced by other factors.

2.2.1. Hypothesis differences among men and women (social circumstances, health vulnerability, and finding variations)

Differences in social circumstances among men and women

Hypothesis differences in socio-explanations of health inequality among men and women remain debatable in the literature. Previous studies have indicated that the association between poor health status and older age is more likely to be seen in women (Singh et al., 2013). Women were more likely to be unemployed and engage in other types of activity (unemployed, but seeking work, renters, pensioners, remittance recipients, disabled, beggars, prostitutes, etc.) more frequently than men (UNFPA., 2012). In most developing countries, women have a lower educational level than men and educational level is a more important factor for women than men (Singh et al., 2013; Teerawichitchainan, 2010; UNFPA., 2012). However, previous research in developed setting shows that although a higher educational level is found in women, they were more likely to work in occupations with lower salaries than men (Molarius et al., 2012). Men are less likely than women to be single at a later age and more likely to remarry when their spouses die (Giang & Pfau, 2007; UNFPA., 2012). Women are seen to be engaged in domestic work more often than men and they are seen to be more vulnerable to economic insecurity than men (Molarius et al., 2012; WHO., 2008). A higher rates of tobacco use and alcohol consumption are found in men than women (Case & Paxson, 2005; Hoang et al., 2008). Men are more likely to be associated with life-threatening diseases that are more likely to be fatal than are women (Case & Paxson, 2005).

Differences in health vulnerability among men and women

Differences in vulnerability among men and women are found to vary, with some indicator found to be more important for men than women with regards to health status. On the other hand, some predictors are seen to be more associated with women's health status than men. Indeed, previous studies show that economic security, perceived sufficiency of income, working, and chronic disease are found to be more important indicators of good health for women than men (Demirchyan et al., 2012; Hoang et al., 2008; Jerliu, Toci, Burazeri, Ramadani, & Brand, 2012; Molarius et al., 2012). In contrast, tobacco use, alcohol consumption, and educational level are more important determinants of health conditions for men than women (Case & Paxson, 2005; Hoang et al., 2008). Women are more likely to have had a disadvantaged lifetime than men. Disadvantages in education, nutrition, service accessibility, and the workforce in earlier life have a negative effect on the health status of older women and place them into more vulnerable to economic resources. However, reports of UNFPA and HelpAge International in 2012 suggests that women are better than men at diversifying their finance at times of need, such as older men are less likely to remain economically active when they have retired and stayed at home, while older women, on the other hand, may still run a small business. This implies that reduction in traditional role as the main economic provider may put older men into vulnerable situations (UNFPA., 2012).

It has been argued that at a more advanced age and living in a rural area puts women into more vulnerable health conditions than men due to lack of access to healthcare services, lower educational levels, low quality of healthcare services and facilities (Hoang, Byass, Nguyen, et al., 2010; UNFPA, 2011). Moreover, the association between health status and mortality is found to be greater in men than women since men are more likely to be associated with life-threatening diseases that are more likely to be fatal than are women (Case & Paxson, 2005). That may suggest that although men are more likely to perceive they have better health than women, in fact, they might be more vulnerable to death than their female counterparts (Okamoto, Momose, Fujino, & Osawa, 2008). This also reveals that older women report their health status poorly because they tend to suffer more years in illness because of their greater longevity (UNFPA., 2012).

Finding variations on the association between gender and SRH

The association between gender differences and SRH has been observed in a number of aging studies and reveals that SRH is a significant measureable predictor of health status among men and women (Molarius et al., 2012; N. Ng, P. Kowal, et al., 2010;

Singh et al., 2013; Teerawichitchainan, 2010). In contrast to this point, a comparative study on two Asian countries, one developing and the other developed, indicates that gender has no significant impact on SRH among OPs in the two countries (T. A. Khan & Flynn, 2015). In addition, although the prevalence of reporting poor health status among OPs is quite high, there is no difference in reporting health status among older men and women (Demirchyan et al., 2012). Another study shows that after controlling other factors in the multivariate models, there is no difference in SRH between men and women (Kelleher, Friel, Gabhainn, & Tay, 2003).

2.2.2. How an individual's health is influenced

Regardless of biological perspectives, the review of the literature suggests that an individual's health perception is influenced by knowledge about their own health, health risk behaviors, social norms, and gender normative roles that can help explain gender inequality in health (Layes, Asada, & Kephart, 2012).

Knowledge on an individual's health status

A number of studies have shown an inverse relationship between the level of education and reported poor health status. For example, a higher probability of reporting poor health status was found in those with higher educational levels than those less education (Dowd & Zajacova, 2007; Singh et al., 2013). Another study indicated that higher educated people reported higher number of health problems than those with lower levels of education, while a higher level of morbidity was found in less educated people than educated ones (Baron-Epel et al., 2005). Although this study focused on self-accessed morbidity rather than SRH, it implied the role of knowledge in reporting behaviors. Moreover, it has been debated that the meaning of health status vary by the level of education (Dowd & Zajacova, 2007). For example, those with lower levels of education may report their health status based on stressors that they face in daily living, it might narrow down the relationship between SRH and successive mortality in comparison with those with higher educational levels (Huisman, Van Lenthe, & Mackenbach, 2007), or for those with perceived poor health status based on diseases or health limitations they were facing. While those who reported good health status counted on behavioral factors, such as physical activity, and on emotional factors, having a positive affect (Benyamini, Leventhal, & Leventhal, 2003).

Lifestyle behaviors and health status

The behavioral approach argues that differences in health status among older men and women could be counted for by lifestyle risk behaviors, such as smoking, drinking alcohol, daily exercise, or fruit intake. In line with the high prevalence of smoking

and drinking alcohol among men across the world, previous studies in Vietnam showed that the proportion of men who consumed tobacco and alcohol was much higher than that of women across all age groups, especially in rural areas (Hoang, Byass, Dao, Nguyen, & Wall, 2007; Hoang et al., 2008; Teerawichitchainan, 2010). A study also indicated that smoking and drinking were highly associated with chronic diseases that influenced health status (Hoang et al., 2008). The association between health risk behaviors and health status has been well-documented in the literature. However, chronic diseases varied across setting contexts, such as smoking and drinking alcohol were found to be negative for health status and undertaking physical activity was seen to be one of most important determinant factors of good health (Demirchyan et al., 2012; Han, 2014; Molarius et al., 2007). On the other hand, several studies demonstrated that health risk behaviors were not associated with health status (Lima-Costa, Firmo, & Uchôa, 2005). Furthermore, previous study even showed negative effect of healthy lifestyle behaviors (fruit and vegetable intake, doing exercise per day) on SRH or a positive effect of daily smoking and regular alcohol consumption on SRH (Layes et al., 2012; Perlman & Bobak, 2008).

Effects of social norms on an individual's health status

The third argument regarding social norms is that an individual's willingness to disclose their own actual health status or health conditions may cause bias while reporting health status. In particular, a previous study indicated that there was a tendency of hiding health problems in the Arab population that led to inaccuracy or overstate of reported health status as compared to Jewish people. For instance, morbidity and mortality were seen to be higher in Arabs, but they perceived health status more positively than Jews (Baron-Epel et al., 2005). In addition, a study of Layes., et al in 2012 argued that OPs may exaggerate their health status because the oldest age group was found to report better health status than those who were younger. The author hypothesized that the discrepancy between age and SRH might be due to the adaptation and acceptance of OPs to the deterioration of health in old age (Layes et al., 2012). Regarding gender differences, a previous study claimed that women reported their health status more negatively than their male counterparts because they were more aware of their health conditions (Go´mez-Olive, Thorogood, Clark, Kahn, & Tollman, 2010). This hypothesis has been investigated in numerous studies in Western settings and they also made the same conclusions that women were more mindful of their health issues and more likely than men to share their health problems with others (Anson, Paran, Neumann, & Chernichovsky, 1993; Davis, 1981). Furthermore, a study by Teerawichitchainan in Vietnam pointed out that although women were seen to rate their health status lower than men, their vulnerability may not necessarily be warranted in the case of country context. The

reasons were that there was a tendency of perceiving pessimistic health status among them (Teerawichitchainan, 2010).

Review on gender normative roles and health status

Regarding gender normative roles, women, following traditional norms, are more likely to engage in housework and less likely to participate in the labor workforce as compared to their male counterparts (UNFPA., 2012). Results of a previous survey in Vietnam showed the same pattern of labor force participation among older men and women (UNFPA, 2011). Possible explanations for such low proportion in the labor workforce and high participation in housework among women might be due to their high obligations in the household since women mostly provide house-cleaning, laundry, cooking, care for children, and so on. A previous study suggested that gender differences in traditional roles might have a negative effect on women's mental health leading to poor SRH (Teerawichitchainan, 2010). Moreover, a review of the literature indicated that social participation, such as getting together with friends or attendance at clubs/ associations, resulted in better health status among OPs (Han, 2014; Lima-Costa et al., 2005). Particularly, such social network can strengthen social connection and integration (measured by social activity groups), that, in turn can enhance mental health in a direct way (e.g., by reducing isolation) or in an indirect way (e.g., by providing social support). This implies that individuals with a diverse network might have a better mental health than those with a restricted one. Regarding gender, women are found to receive more support, contact with network members more frequently, have more satisfied with their friends than men (Antonucci, 1990).

In addition, doing housework or agriculture without any formal job may put women into more disadvantaged situations in terms of financial insecurity and economic dependency. A previous study indicated that economically dependent individuals were more likely to perceive poorer health status than those who were economically independent (Singh et al., 2013). Furthermore, enrolling social participation or working may pave the way for women's empower and WHO has stated that women's empower was considered as a key to diminish health inequality among men and women (WHO., 2008).

2.3. Theoretical framework on the factors influencing or associated with self-rated health

The notion that an individual's health status is influenced or associated with other factors has been shaped in various conceptual frameworks (Denton et al., 2004; Fylkenes & Forde, 1992; Jylha, 2009; Knauper & Turner, 2003; Moum, 1992). However, work of Marja Jylhä in 2009 and Denton in 2004, to the best of our

knowledge, have provided the most comprehensive theoretical frameworks on the association between health status and influencing factors. Particularly, Jylha provides logical processes on how an individual judges their health status from the very beginning when being asked about their health conditions by a simple question “How is your health in general? Is it excellent, very good, good, fair or poor?” In addition, the work of Denton constructs a comprehensive association among health status and social structural, behavioral, and psychological factors in term of gender differences. Both of these theoretical conceptual frameworks are summarized as follows.

2.3.1. Unified conceptual framework by Marja Jylhä

Various models have attempting to explain the association between SRH and other background factors. However, Jylhä indicates that those studies mainly focus on constructing statistical explanatory analyses (Fylkenes & Forde, 1992; Moum, 1992) or on explaining the cognitive stream based on what they actually have in questionnaires (Knauper & Turner, 2003). In order to provide more explicit understanding on what is SRH and how people perceive their health status, Jylhä in 2009 developed contextual frameworks of health evaluation showing three different stages in the process of health self-assessment: 1) culturally and historically varying conception of health; 2) reference groups, earlier health experiences, health expectations; and 3) cultural convention in expressing positive and negative opinions and in the use of the scale (Jylha, 2009). Jylhä claims that assessing health status is not only statistical analyses or what is written in questionnaires.

Jylhä argues that judging health status is a logical process of evaluation in which at the first stage, once a respondent is asked about their health status, they need to understand the meaning of “health”, then detect what sorts of elements should be part of “their health status”. At the second stage, then, the respondent has to think about the mechanism in which those elements should be taken into consideration. At the final stage, they have to make a decision on which level in the response options best reflects them. Thus, the final outcome of the evaluation depends on a respondent’s understanding about health and the consideration of the elements of their health status. In each stage, Jylhä gives a wide range of factors that may influence health assessment, namely: demographic characteristics, socioeconomic factors, medical diagnoses, functional status, body symptoms.

2.3.2 Theoretical framework on the social explanation of inequalities in health between older men and women by Denton

Denton in 2004 states that health is a multi-faceted notion and comparisons of studies about the association between determining factors and health status may not be appropriate due to differences in setting contexts and measures used (Denton et al., 2004, p. 2597). In his work in Canada, Denton uses multiple health predictors: social

structural factors (age, living arrangement, social support, activity status, educational attainment, occupational status, and income adequacy), behavioral factors (physical activity levels Body Mass Index, smoking, and drinking), and psychological factors (childhood trauma index, chronic stressors, psychological resources measured by a six-item self-esteem index (e.g., so sad that nothing could cheer you up, nervous, restless/ fidgety, hopeless, worthless, and everything was an effort), mastery, and coherence) to examine whether these health indicators have an impact on health status and to what extent they reflect gender differences in health. The reason this study is distinctive is that it uses multi-dimensional health indicators, including subjective, objective, and mental health measurements. Therefore, this study can shape an overview of a conceptual framework about health status and related factors.

Findings from Denton's study point out that social structural, behavioral, and psychological factors do have relative impacts on individual's health status and also indicates variations on the degrees of the association between the selected factors and gender differences. In particular, age, living arrangement, main activity, educational level, income, occupation and social support are found as crucial structural determining factors of health status for both sexes. However, their effect on gender is varied. In terms of gender-based factors, smoking, alcohol consumption and physical activity are found to be more crucial determining factors of health status for men; while body weight is more crucial for women. The ability in predicting health status of childhood/ life events, chronic stressors and psychological resources is found to be greater in women than men (Denton et al., 2004).

2.4. Literature review on the effect of explanatory variables on self-rated health

Based on the two theoretical frameworks above, and due to the scope of dataset, demographic characteristics, socio-economic factors, lifestyle risk factors, and chronic disease were used as explanatory variables to determine their associations and health status with regards to gender differences in this study.

2.4.1. Demographic characteristics (age, marital status, place of residence, living arrangement, and region)

Age

Age is seen as a very important variable, mostly used as an explanatory in health-related studies. Previous studies have shown that increasing age is significantly associated with health deterioration, especially in the older population (Haseen et al., 2010; Hoang et al., 2008). In addition, age has received great attention of researchers with respect to the association between age and quality of life, as well as the well-being among older population. A number of studies have shown consistent findings

that age has an important impacts on the quality of life (Wiggins, Higgs, Hyde, & Blane, 2004). In particular, it has been found that individuals aged 70 and over were seen to have a lower quality of life as compared to younger people. Importantly, previous studies have pointed out that the quality of life of individuals decreases regularly after peaking at a certain age (Netuveli, Wiggins, Hildon, Montgomery, & Blane, 2006). Although some studies have not found any statistically significant association between age and quality of life, some studies do confirm the effects of age on quality of life. They also indicate that older men have lower quality of life than their women peers (Zaninotto, Falaschetti, & Sacker, 2009).

The association between age and health outcomes has been well established in the literature. Age has been shown to be an inverse relationship with SRH, as poor health status increases with increasing age. In other words, the older the people are, the poorer they perceive their health status. A number of studies have revealed consistent trends that increasing age has a significantly negative impact on SRH. In fact, younger OPs reported their health status better than those of OPs (Hoang, Byass, Nguyen, et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; T. A. Khan & Flynn, 2015). For example, those aged 60-69 perceived their health status better than those aged 80 and over. In terms of gender differences, age groups were found to be different in older men and women on reporting health status. Previous study indicate that, for women, those aged 55-64 are more likely to report poor health status as compared to those who are older; whereas the equivalent figure for men is those aged 65-79 (Molarius et al., 2007). Such findings imply that older men and women may have different perception towards health status, such that older women tend to evaluate their health conditions more positively than those who are younger, while an opposite trend was seen for older men.

Marital status

Data from the Vietnam Household Living Standard Survey (VHLSS) in Vietnam in 2008 show that the number of married OPs make up the largest share, followed by those in the widowed group (UNFPA, 2011). The association between marital status and health condition has been well-documented in the literature. A possible explanation is that marital status may be associated with a longer time of survival in later life. It has been revealed that marital status has a significant effect on the well-being of OPs in Vietnam. Spouses are seen to help and support each other in daily living. Moreover, they also share their happiness, difficulties in life, and take care of each other when in need (UNFPA, 2011). A study has indicated that being a spouse has a positive effect on the well-being of OPs (Knodel & Chayovan, 2008). A study of Giang and Pfau in 2007 pointed out that age and gender in widowed group were seen to be different. In particular, the number of widowed women significantly

outnumbered that of their male counterparts. The trend can be seen to be more clearly in advanced age. This is possibly because the longevity of women is relatively greater than men and, traditionally, men tend to marry younger women (Giang & Pfau, 2007). However, findings on the association between SRH and marital status remains debated in the literature as previous studies have shown inconsistent findings.

Previous studies suggest that those who are currently married or cohabiting are more likely to rate their health better than those who are single, separated, divorced or widowed (N. Ng, M. Hakimi, et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013). On the other hand, several research findings indicate that marital status, or the number of OPs living in a household, has no effect on SRH (Hoang, Byass, Nguyen, et al., 2010; T. A. Khan & Flynn, 2015). In addition, Khan and Flynn conducted a comparative study in two countries and found that marital status is significantly associated with SRH in Malaysia, but not significant in Singapore (T. A. Khan & Flynn, 2015), implying that the association between marital status and SRH might vary by different setting contexts.

Place of residence: Rural versus urban

Most of the studies on aging have suggested that people living in rural and urban areas perceive their health conditions differently, implying a strong association between place of residence and health status. It has been indicated that those living in rural areas are more likely to rate their health status poorer than those living in urban areas (Ahmad, Jafar, & Chaturvedi, 2005; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013). A previous study also pointed out that rural-to-urban migration of younger generations has had a significant impact on the health status of OPs in both spiritual and material senses. The reason is that OPs may lack contact with their children, family support and have to do house work on their own (AF., 2010). Thus, such migration trends may put OPs in rural area into more vulnerable situations. Reports of UNFPA in 2011 show that most OPs in Vietnam were living in rural areas, accounted for 73 percent in 2008, and they were more disadvantaged in terms of economic situation, differences in healthcare development, and healthcare information accessibility (UNFPA, 2011). The reports indicate that the health status of OPs could be influenced by their disadvantaged residence. Specifically, previous studies show that people living in urban areas are 0.39 times less like to report poor health status than those living in rural areas (Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013), or those living in rural areas are 1.4 times more likely to rate poor health status than those living in urban areas (Ahmad et al., 2005), as they may have lower educational level or have difficulties in accessing healthcare services.

Region

The notion that the health status of OPs varies by region has been observed in a number of studies. Findings suggest that people living in different regions have different perception of self-rated health (Singh et al., 2013). There are several good reasons to explain why region should be included in this study. Firstly, by 1986, the economy of Vietnam witnessed significant development, transforming from a redistributive to market economy. In particular, according to the World Bank in 2012, Vietnam's gross national income per capita increased rapidly from \$610 in 1990 to \$1,400 in 2000 and \$3,060 in 2010, although the economy greatly varies by region (WB., 2012). Moreover, previous studies show that economic status or income plays a very important role on the reporting of the health status of OPs (Hoang, Byass, Nguyen, et al., 2010; Molarius et al., 2007; Teerawichitchainan & Giang, 2013). Thus, the difference in regional economies may affect the health status of people. Secondly, most studies on the impact of war on Vietnamese's health status has focused on the North (Teerawichitchainan, 2012; Teerawichitchainan & Korinek, 2012) as the purpose of the country's reunion, people living in the north had to go for war to take the south back from the Americans. Hence, they may have been exposed to risk factors that might influence their health status in both physical and mental health in later years of life. Therefore, differences in health reporting by region can be expected to be found. The last reason is that this factor is supported by findings in previous studies. In particular, region is found to be correlated with health status. For example, people living in the south of Vietnam are more likely to report poor health status than those living in other regions (Teerawichitchainan, 2010).

Living arrangements

It has been indicated that there are various factors that contribute to the well-being of OPs: living arrangements, housing conditions, living conditions, cultural and spiritual factors; of which, living arrangements are considered as one of the most crucial predictor of the well-being for both older men and women. Spouses are the one who mostly support each other in daily living as well as, sharing difficulties in both materials and spiritual issues (UNFPA, 2011). Living arrangements also reflect family support in both ways, meaning that OPs provide care for children and do house works for others. The other way is that OPs receive care and financial support from others. For example, reporting poor health status is less likely to be seen in those who share their wealth with others. In terms of care and help support, those who provide such support are less likely to perceive poor health status (T. A. Khan & Flynn, 2015). Moreover, evidence shows that single people are seen to be more likely to be associated with poorer health status as compared with those who get married. However, as compared to married respondents, widowed peers are less likely to rate

their health status as being poor (Haseen et al., 2010). Those who live without a spouse tend to assess their health status as being poor than those living with a spouse and the number of people living in a household has no association with health outcomes (Hoang, Byass, Nguyen, et al., 2010), implying that living with a spouse in later life may be more important of good health than other factors.

2.4.2. Socio-economic status (educational level, household wealth indexes, perceived sufficiency of income, and employment status)

Educational level

Educational level is a very important variable for health studies as most studies have used this variable as one of the key predictive indicators of health status. Educational level is found to be significantly associated with health conditions of OPs for both genders. This may be because this variable may reflect knowledge of health risk factors (Hoang, Byass, Nguyen, et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; T. A. Khan & Flynn, 2015). For example, a previous study in Vietnam shows that those with lower educational levels are seen to have a significantly higher prevalence of chronic diseases as compared to those with more advanced education (Hoang et al., 2008). In addition, most the studies on aging find a consistent pattern that those with higher educational levels tend to report their health status better than those with lower education (Hoang, Byass, Nguyen, et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; T. A. Khan & Flynn, 2015). For instance, one of the studies revealed that individuals with less than a primary level of education are twice as likely to report having poor health status as compared to those with higher educational levels (Haseen et al., 2010). However, previous studies also reveal inverse associations between educational level and health status. In particular, the likelihood of reporting a poor health status is found to be higher in those with higher education as compared to those with less education (Dowd & Zajacova, 2007; Singh et al., 2013). This implies that research findings vary depending on setting contexts.

In terms of gender differences, a previous study shows that, when controlling for other factors, educational level has an independent association with SRH among older men, but not among older women, or educational level is found to be insignificant in women, but an inverse correlation is shown in men (Singh et al., 2013). This implies that educational levels may have a stronger health effect in men than women (Molarius et al., 2007). This finding was reinforced by a recent study in Armenia (Demirchyan et al., 2012), which might suggest that older men and women with different levels of education may have diverse attitude towards their health status.

Household wealth indexes

Numerous studies have suggested that household wealth indexes are one of the most important factors that strongly predict health outcomes in epidemiological studies. The significance of household wealth indexes not only has a well-established impact on health status, but also quality of life among the older population (Han, 2014; Hoang et al., 2008; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013). It has been claimed that those who are wealthier have better health status than those who are poorer because they can afford healthcare services, have better living conditions and eat a healthier diet (Singh et al., 2013). Moreover, a previous study emphasizes the significance and importance of household wealth indexes on aging with respect to gender differences. In particular, a study in Sweden shows health inequality between older men and women would have disappeared if women had financial security (Molarius et al., 2012). Additionally, most of the previous research has indicated that poor health status is less likely to be seen in wealthier individuals or people in higher wealth quintiles have a better health status as compared to those who in lower health quintiles (Haseen et al., 2010; N. Ng, M. Hakimi, et al., 2010).

Furthermore, resource availability, such as gross domestic product per capita or income has been used to predict the association between longevity and gender differences. It has been suggested that the impact of gender differences would decrease if gross domestic product per capita increases. However, study findings are found to vary depending on setting contexts. For example, differences in income are found to be correlated with longevity in developing countries, but not in developed ones (Moller et al., 2009). A recent study also reveals that household wealth indexes and gender are strongly correlated, in which wealthier men and women have a lower probability of reporting poor health status as compared to those with lower household wealth indexes (Singh et al., 2013). However, the association between household wealth indexes and gender differences is shown to vary. For example, household wealth indexes is found to have no significant association with gender differences on reporting health status in Bangladesh but it does explain 71 percent and 82 percent of reported health status among older men and women in Nairobi, Kenya, and Agincourt, South Africa respectively (N. Ng, P. Kowal, et al., 2010).

Perceived sufficiency of income

In addition to financial issues of OPs, perceived sufficiency of income emerges as a significantly predictive variable to determine SRH of OPs. It has been revealed that self-perceived income is a more applicable assessment than the amount of money a person really has in reporting health status since it reflects the perception of individuals as to whether they have sufficient resources to afford daily living

expenditures or medical care or to maintain their health (Carlson, Pozehl, Hertzog, Zimmerman, & Riegel, 2013; Fabíola Bof, Maria, Jair Lício, Doralice Severo, & Yeda Aparecida, 2012). It has been observed that poverty and the health status of OPs are significantly associated. For instance, the number of chronic diseases increases with increasing levels of poverty (N., Toci, Burazeri, Ramadani, & Brand, 2013); in terms of gender differences, self-perceived poverty is shown to be more frequent among older women (Jerliu et al., 2012). Findings from previous studies show that self-perceived income is strongly associated with SRH; those who perceive a sufficiency of income are more likely to report better health status as compared to those who perceive an inefficiency of income (Carlson et al., 2013; Fabíola Bof et al., 2012; Yan, 2008).

Employment status

Working is essential for human being as it reflects functioning abilities in terms of physical activities, and economic independence in terms of money. Employment status is shown to be significantly associated with multi-morbidity. In fact, multi-morbidity is found increase in those who are not currently working (Ninh, Ninh, Khanal, & Moorin, 2015). Types of occupation of OPs also are a matter to be considered, where those working in certain jobs (small traders, temporary workers, household keepers, handicraft makers, jobless) are seen to suffer more from chronic diseases than those working on farms (Hoang et al., 2008). In terms of finances, previous studies point out that those who are economically independent have a lower probability of rating their health status as being poor as compared to those who are economically dependent (Singh et al., 2013).

In addition, evidence from previous studies have suggested that the health status individuals' could be affected by unemployment through various factors such as reduction in income, psychological stress, and loss of social networks (Molarius et al., 2007; Svedberg, Bardage, Sadin, & Pedersen, 2006). This finding suggests that working itself not only has an impact on health status but also has a relative correlation with other factors that may attribute to an individual's health status. Unemployment also is found to be an important indicator in determining the health condition of OPs. For example, poorer health status is found to be associated with those who currently are not working (Haseen et al., 2010; Molarius et al., 2007; T. A. Khan & Flynn, 2015). Moreover, the impact of employment status on SRH could be different in terms of gender. Specifically, unemployment and fair/poor health status are found to be not associated in men, but are shown to be correlated in women in different ways (Demirchyan et al., 2012).

2.4.3. Lifestyle risk behaviors (smoking and drinking) and chronic disease

Smoking and drinking

Alcohol consumption and smoking are well-known to be significantly associated with health status. Alcohol consumption and smoking are found strongly correlated with chronic diseases (Hoang et al., 2008). Smoking is seen as a main cause of a wide range of fatal diseases, such as lung diseases and various types of cancer (Hoang, Kim, et al., 2010). However, the association between alcohol consumption and health status is found to vary by different contexts. For example, alcohol consumption is significantly associated with poor health perception in OPs with low income (Lima-Costa et al., 2005). However, other studies show a positive effect of drinking on SRH among men. In particular, those who consume small to moderate amounts of alcohol are seen to perceive their health status as being better as compared to heavy drinkers or abstainers (Demirchyan et al., 2012), thus regular drinking alcohol is found to contribute to better health status (Perlman & Bobak, 2008).

In terms of smoking, tobacco use has a substantial negative effect on health status and is responsible for millions of deaths each year in the world. Tobacco use ranks as a leading cause of death in Vietnam, accounted for around 40,000 deaths in 2008 and was attributed for a loss of 6.8%-7.7% Disease-Adjusted Life Years (DALYs) in 2006. As one of the leading causes of chronic diseases, tobacco use poses a great burden on society and the healthcare system due to the cost of treatment. Previous studies indicate that smoking is seen to have a strong association with SRH. People who have ever smoked are 2.4 times more likely to perceive their health status as being poor as compared to people who have never smoked (Demirchyan et al., 2012). In addition, different genders react differently towards smoking and alcohol drinking behaviors, especially in rural areas where the prevalence of smoking and drinking is very high (Hoang et al., 2008). For example, those who consume tobacco and alcohol are found to have an increased probability of having at least one chronic disease. However, this has been found to be significant only in men.

Chronic diseases

According to WHO, non-communicable diseases are the main burdens for OPs. Poor countries and OPs of middle-income nations suffer more from the burden of such diseases as compared to wealthier nations (WHO.). Recent evidence also shows that around 80 percent of deaths caused by non-communicable diseases happen in low-and middle-income countries and most deaths take place after the age of 60 in the world (WHO., 2011). As a result, non-communicable diseases create major burdens on healthcare systems (Phaswana-Mafuya, Peltzer, Chirinda, Musekiwa, et al., 2013).

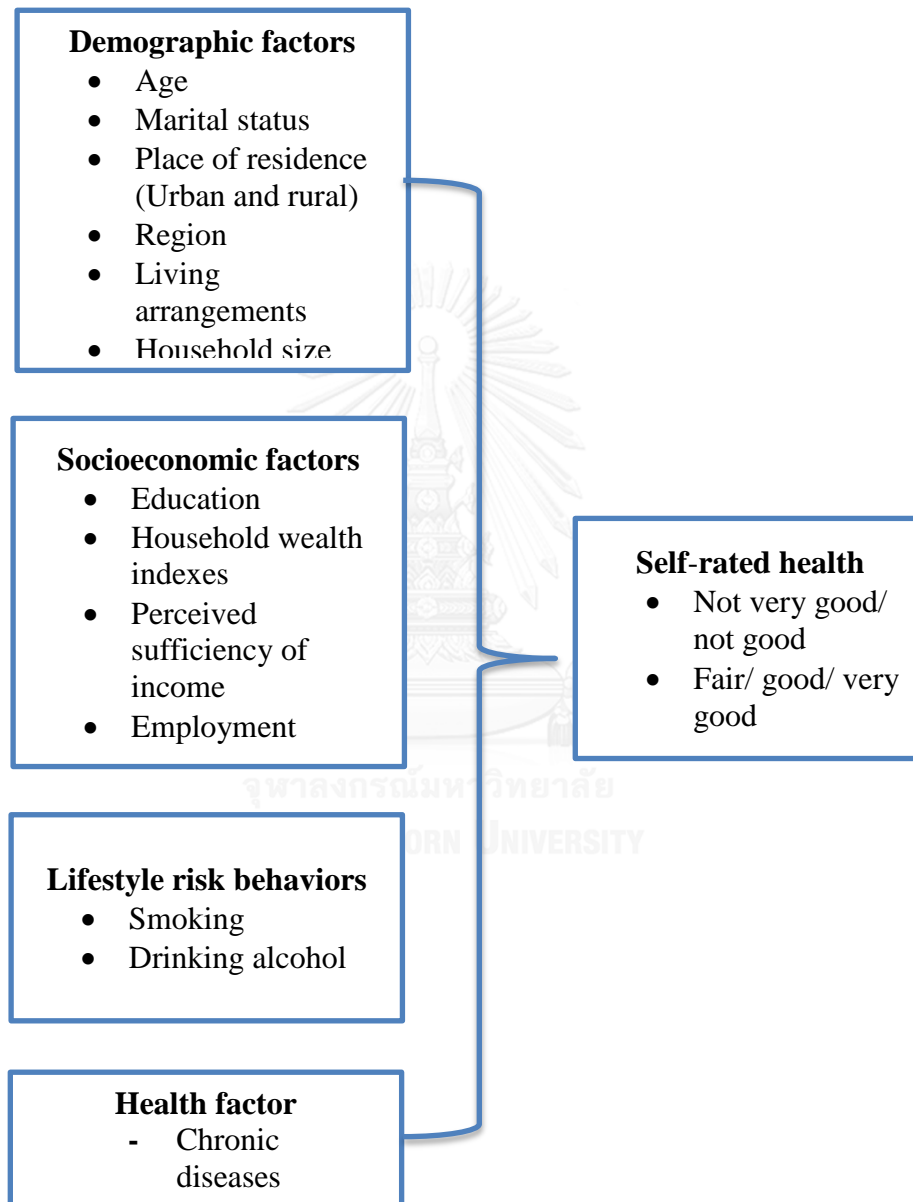
Age and illness are seen to have a strong association; the more advanced age is, the higher proportion of OPs with illness is (Evan et al., 2007).

Previous studies indicate that chronic diseases are one of the main factors influencing health outcomes in both genders (Haseen et al., 2010; Hoang et al., 2008; Molarius et al., 2007). For example, those with no disease are more likely to report better health status than those with one or more than one disease. In addition, chronic disease is found to have a close relationship with other factors in predicting health outcomes, such as the prevalence of chronic disease is found to be higher in those with lower education (Demirchyan et al., 2012), or chronic disease is seen more frequently with increasing age or in women with poor economic status (Hoang et al., 2008). In addition, although showing no significance, the joint effects of a combination among three variables – old age, smoking and drinking – increase the probability of having at least one chronic disease (Hoang et al., 2008). Moreover, it has been observed that the number of chronic diseases is one of the strongest factors in determining self-rated health in the older population (Haseen et al., 2010).

2.5. Conceptual framework of this study

A review of the literature suggests that there are four main groups of independent variables that could explain the association of SRH and selected factors among older men and women: demographic characteristics (age, marital status and place of residence, household size, and region); socioeconomic factors (educational level, household wealth indexes, perceived sufficiency of income, employment status, and living arrangement); lifestyle risk behaviors (drinking and smoking); and health factors (chronic disease). The conceptual framework of this study is summarized as follows:

Figure 1: Theoretical framework on the factors influencing or associated with self-rated health



2.6. Hypotheses

There is a main hypothesis and related hypotheses in this study as follows:

Main hypothesis:

The factors associated with SRH are likely to differ by gender.

Related hypotheses:

Women are more likely to perceive poor health status than men. The association between SRH and gender differs by the contribution of other factors. Thus, it can be hypothesized that demographic characteristics, socioeconomic factors, lifestyle risk behaviors and chronic diseases have different impacts on SRH among older men and women.



CHAPTER 3

DATA AND METHODOLOGY

3.1. Data source

This study used the secondary data from the Vietnam Aging Survey (VNAS) in 2011, which was conducted by the Indochina Research and Consulting (IRC) and the Institute of Social and Medical Studies (ISMS). Data from VNAS provided key socioeconomic and health indicators of OPs in various areas and regions in Vietnam.

The design of the VNAS questionnaire was based on a number of international and standard surveys, such as the World Health Organization aging survey, Study on Global Aging and Adult Health (SAGE), and those used in other countries, such as Cambodia, South Korea, China, Laos, and Thailand, as well as questionnaires used in national surveys in Vietnam, such as Population and Household Survey (PHS), Vietnam (Household) Living Standard Survey (V(H)LSS), and Vietnam National Health Survey (VNHS).

The design process and questionnaire also took into account the cultural differences between regions and ethnic groups. The questionnaire was designed by experts from the Economic, Social and Environmental Statistic Department and Population and Labor Statistic Department of GSO, who are knowledgeable on the issues of population aging.

The sampling frame for VNAS was derived from PHS 2009. *(The process of sampling in this study was summarized from VNAS's final report (see more detail at page 24 to page 26 in the report by Vietnam Women Union, 2012)).*

3.2. Location for the survey

Survey samples were divided according to six locations in Vietnam, including the urban and rural areas for each region. In these regions, 12 provinces were randomly selected for the samples. Sampling methods to choose the 12 provinces were based on two steps:

- Step 1 - Select the number of selected provinces in each region: Data from the population census were used for calculating the average size of the population per selected province. According to data from the population census, the total number of people aged 50 and above was around 17,019,707 and the average size of the population per selected province was around **1,418,309**. The

number of selected provinces in each region (aged 50 and above) was calculated by taking the total population in each region divided by **1,418,309** (see Table 3). The number of selected provinces was rounded in each region and oversampling and under sampling were taken into account to make sure that the estimation of the sampling method reflected the true distribution in each region.

Table 3: Distribution of selected provinces by region

Region	Total population	No of selected provinces	Rounded
1	4,682,017	3.3	3
2	1,972,347	1.4	1
3	3,938,741	2.8	3
4	729,433	0.5	1
5	2,356,508	1.7	2
6	3,340,651	2.4	2
Total	17,019,707	12	12

Source: Vietnam Women Union, 2012. Key findings of Vietnam Aging Survey, 2011, pp 76.

- Step 2 - Select provinces for each region: the provinces in each region were arranged in descending order by population size, then accumulation of population for each region was calculated. The first selected province was the province that had a cumulative population closest to **1,418,309** and the second selected province was the province that had a cumulative population closest to two times **1,418,309** (see Table 4).

Table 4: Example. Sampling procedure for choosing provinces in region 1 (Red River Delta)

Pro code	Province	Region	Region code	Total population	Cumulative population
35	Ha Nam	Red River Delta	1	204,424	204,424
26	Vinh Phuc	Red River Delta	1	207,372	411,796
27	Bac Ninh	Red River Delta	1	220,428	632,224
37	Ninh Binh	Red River Delta	1	222,551	854,775
22	Quang Ninh	Red River Delta	1	241,295	1,096,070
33	Hung Yen	Red River Delta	1	271,799	1,367,869
30	Hai Duong	Red River Delta	1	431,569	1,799,438
31	Hai Phong	Red River Delta	1	454,840	2,254,278
36	Nam Dinh	Red River Delta	1	480,754	2,735,032
34	Thai Binh	Red River Delta	1	513,637	3,248,669
1	Ha Noi	Red River Delta	1	1,433,348	4,682,017

Source: Vietnam Women Union, 2012. *Key findings of Vietnam Aging Survey, 2011*, pp 76.

By doing the same step for other regions, the 12 selected provinces were: Hung Yen, Nam Dinh, Ha Noi, Thai Nguyen, Thua Thien Hue, Quang Nam, Thanh Hoa, Dak Lak, Dong Nai, HCMC, Soc Trang and Tien Giang.

3.3. Sample size and sample selection

VNAS sampling procedure comprised of five steps, as follows (*Vietnam Women Union., 2012*):

1. The first step, 12 provinces were selected from six ecological regions;
2. The second step, 200 communes were selected from the 12 selected provinces;
3. Two villages were randomly selected in each selected commune in the third step;
4. The fourth step, 15 people aged 50 years old and above were randomly selected in each village for interviews, in which 10 people were officially interviewed and 5 people were reserved as alternatives. The number of respondents depending on the volatility of the key indicators of the local survey;
5. The final step, 10 older people (aged 50 and over) were selected for each village. The sampling of older people was selected according to their age groups. Out of 10 persons, three people aged 50-59, three people aged 60-69, two people aged 70-79 and two people aged 80 and over were selected.

The expected sample size estimated for VNAS was around 4,000 people aged 50 and over. This number allowed for estimating main indicators at the regional level.

Moreover, the proposed sample size allowed for reliable estimates for different indicators in terms of age (including four groups: 50-59; 60-69; 70-79; and 80 and over), ethnicity (including Kinh and ethnic minorities), and gender (male and female).

Total 4,007 cases of older persons were interviewed. Of those, 1,218 were aged 50-59 and 2,789 were OPs (aged 60 and over). Of these OPs aged 60 and over, there were 1,189 people aged 60-69; 819 people aged 70-79 and 781 people aged 80 and over. There were 1,683 female older persons and 1,106 males.

3.4. Study sample

Vietnam National Aging Survey was conducted by Institute of Social and Medical Study (ISMS) and Indochina Research and Consulting (IRC) in September, 2011. It was the *first* nationally representative survey on OPs in Vietnam. The survey aimed to provide necessary and important information for policy advocacy to promote rights of OPs in the country. Respondents were asked about their background information (e.g., age, gender, marital status, and working status); family life (such as living arrangements, family relationships, and care and being cared for); relationships and the role of older people in communities and society (e.g., participation in community activities, and access to policy information sources). This study employed the VNAS data and confined the sample to only population aged 60 and over which comprised 2,789 persons. In order to avoid bias, the final sample for the analysis excluded the proxy cases (e.g., those who could not answer the question on their own) and missing data. For missing data, an entire record was excluded from analysis if any single value was missing. Thus, there were 97 cases were removed from the analysis. For proxy issue, if the whole section about health status was answered by others instead of the older person, such cases were excluded from the analysis. Therefore, total 143 cases of proxy were removed from the analysis. Finally, the total sample size for the analyses of the current study was 2,549 older persons. In which, about 1,534 OPs were women and 1,014 were men.

3.5. Variable measurements

In this study, self-rated health (SRH) was used as a dependent variable. The independent variables were divided into three main groups: demographic characteristics, socioeconomic factors, lifestyle risk behaviors, and having chronic disease.

Dependent variable

Self-rated health was employed as a dependent variable. The respondents were asked to evaluate their overall health status from very poor to very good. Self-rated health was grouped into two categories: a poor health group comprised of those who rated their health status as very poor and poor and a good health group for those who rated fair, good, and very good.

Independent variables

Demographic characteristics

- *Age* was grouped into three categories: 60-69 years, 70-79 years, and 80 and over.
- *Gender* was divided into two groups as male and female.
- *Marital status* was categorized into two sub-groups as currently married and others (single/ separated/ divorced/ widowed).
- *Place of residence* was classified as urban and rural areas.
- *Region* was grouped into three categories: the north, the center, and the south.
- *Living arrangements* were categorized into four groups: living alone, living with a spouse only, living with at least one child, and others.
- *Household size or the number of the persons residing in a household* was treated as continuous variable.

Socioeconomic factors

- *Educational level* was divided into four groups: no schooling/ incomplete primary school, primary school, secondary, and high school and over.
- *Household wealth indexes* were constructed by using principle component analysis techniques (Vyas & Kumaranayake, 2006). Five wealth quintiles were constructed by documenting a variety of variables including household income, lands' possession, type of house, materials of roof and floor, toilet facilities, electricity and water supplies, household assets. For the bivariate and multivariate analyses, these five quintiles were recoded into three sub-groups as poor, average, and rich.
- *Perceived sufficiency of income or self-perceived income to meet their daily need* was divided into two groups: sufficiency (enough or more than enough) and insufficiency (rarely or never enough or sometimes not enough).
- *Employment status* was defined as individual's working status in the past 12 months. This variable was coded as working and not working.

Lifestyle risk behavior

- *Drinking alcohol* was defined as having consumed alcohol in the last 6 months.
- *Smoking behavior* was defined as smoking or non-smoking during the time of interview.

Having chronic disease

- *Having chronic disease* was derived from the question whether the older persons “have ever been diagnosed with any chronic diseases, namely: arthritis, angina, diabetes, chronic lung diseases (emphysema, bronchitis, COPD), depression, blood pressure problem, cancer, cataract, heart diseases, liver diseases. Therefore, having chronic disease in this study was defined as being diagnosed with at least one chronic disease.

All variables included in this study were summarized as follows:

Table 5: Classification and measurement of selected characteristics of respondents aged 60 years old and above in Vietnam

Variables	Classification and measurement of variables	Source of information
<i>Dependent variable</i>		
Self-rated health	Fair/ good/ very good = 0; Very poor/ poor = 1;	QI1
<i>Independent variables</i>		
Age groups	Age group 60-69 = 0; 70-79 = 1; 80+ = 2.	QB4
Gender	Female = 0; Male = 1	QB2
Marital status	Others(single/ separated/ divorced/ widowed) = 0; Currently married = 1.	QB5
Educational level	No schooling/ incomplete primary school = 0; Primary school = 1; Secondary = 2; High school and over = 3.	QB6
Place of residence	Rural = 0; Urban = 1	Constructed by commune ID
Region	The North = 0; The Center = 1; The South = 2.	Constructed by provincial ID

Household wealth indexes	Poor = 0; Average = 1; Rich = 2.	QD2, QD4 to QD14, QF1, QF4, QF8, QF9
Household size	Continuous variable	Section B – Household profile
Perceived sufficiency of income	No (rarely or never enough/ sometimes not enough) = 0; Yes (enough/ more than enough) = 1.	QF11
Employment status	Not working = 0; Working = 1.	QE1, QE2, QE3
Living arrangements	Living with at least one child = 0; Living alone = 1; Living with a spouse only = 2; Others = 3.	QB3
Chronic diseases	Having no disease = 0; Having at least one disease = 1.	QI4
Smoking status	No = 0; Yes = 1.	QI33
Drinking alcohol	No = 0; Yes = 1.	QI37

Variables received a value of zero were defined as reference groups in this study.

3.6. Methods of analyses

In order to determine the association between self-rated health and potential factors, several statistical analyses were performed. Firstly, descriptive analyses were used to provide background information about socio-demographic characteristics and prevalence of poor health status by gender. Chi square test was used to determine whether there is significant association between each variable and gender.

Secondly, in order to see whether men and women perceive health status differently or not, logistic regression analyses were first performed for total population. In this logistic regression model, gender was treated as an independent variable and all of other variables (demographic characteristics, social economic status factors, lifestyle risk behaviors, and chronic disease) were controlled. If the results show that men and women report their health status statistically different, then the logistic regression

models for each gender should be performed to identify the underlying factors influencing SRH as well as comparing and contrasting between older men and women.

Finally, multiple logistic regression was performed to examine the association between potential factors and reporting poor health status among older men and women. An odds ratios (OR) was used to measure the significant effect of the independent variables on the dependent one and a p-value of < 0.05 was regarded as statistically significant. Before performing the multivariable logistic regression, multicollinearity analyses were applied to make sure the independent association among the selected variables.



CHAPTER 4

FINDINGs OF THE STUDY

4.1. Results of descriptive analyses

4.1.1. General characteristics of older people

The normalized weight was used to ensure that the sample was representing the true distribution of the population in each strata and age groups. Table 6 showed the general characteristics of the respondents aged 60 and older of the VNAS, which was used for this study. The mean age of the respondents was around 71 years. The older persons aged 60-69 had the highest proportion (47.4%), followed by those aged 70-79 (32.1%) and 80 and over (20.5%), respectively.

More than half of the elderly respondents reported that they did not work during the past year. About 41 percent of OPs worked. Comparing with the PHS in 2009 (GSO., 2010), the proportion of the older persons worked during the past year tended to increase over time (from 35.2% in 2009).

In term of education attainment, the older persons with no schooling or incomplete primary school accounted for almost half of the sample (48.9%). Very few of them completed high school or higher levels.

Vietnamese people view marriage as a permanent institution (T. B. Nguyen, 2012). Even at the old age, majority of the OPs were still married (70.3%).

Regarding living arrangements, those living with at least one child still had the largest proportion (65.5%), followed by those living with a spouse only (18.0%). The percentage of older persons who live alone accounted for only 5.4 percent.

The results in Table 6 revealed that nearly half of the older persons lived in the South (about 44.9%), followed by those living in the North (35.0%) and the Center (20.1%). In addition, most OPs resided in rural areas (67.9%).

Considering the wealth indexes, about two-fifth of the OPs were poor (40.8%). Very few of the older persons were classified as being rich. Moreover, majority of the older people perceived that they had insufficient income (61.2%).

4.1.2. Characteristics of OPs by gender

Table 6 also showed the results the background characteristic of the older respondents by gender. The results showed the tendency of feminization of aging. In the other words, the excess of the proportion of elderly women over elderly men increasingly pronounced with age. In particular, among people aged 80 and above, women constituted almost one-fourth of all OPs.

In terms of employment status, the proportion of older men who were still working during the past year was higher (48.7%) than older women (34.6%).

Regarding educational attainment, older men were more likely to receive higher education than older women. Comparing with older men, the proportion of elderly women with the no education or incomplete primary school had more than doubled. On the contrary, the proportion of elderly men with high school or higher levels was about three times higher than that of elderly women.

Considering marital status, gender differences in marital status were apparent. The results of bivariate analysis revealed that elderly men (90.8%) were more likely to marry than elderly women (54.8%). On the contrary, women had a higher proportion of being separate, widowed and single than men.

The percentage of living with at least one child was quite similar for both older men and older women. However, the proportion of those living alone was higher for older women (8.3%) than older men (1.6%). On the contrary, the older men were more likely to be marriage and live with their spouse than older women.

Considering wealth indexes, it is interesting to see that elderly women has a higher proportion of those classified as being rich than men (30.1% versus 20.4%). However, women tended to perceive insufficiency of income slightly more than men.

Table 6: Results of descriptive analyses: Some selected background characteristics of the study by gender (total unweighted cases = 2,549)

Variables	Women	Men	Total (Weighted percent)
Socio-Demographic characteristics			
Age groups*			
60-69	43.3	52.7	47.4
70-79	33.5	30.3	32.1
80+	23.2	17.0	20.5

Mean age (\pm SD)	71.7 (\pm 8.8)	71.1 (\pm 8.4)	71.4 (\pm 8.7)
Household size			
Mean household size (\pm SD)	3.9 (\pm 2.1)	4.0 (\pm 2.1)	3.9 (\pm 2.1)
Working status in the past 12 months***			
Not working	65.4	51.3	59.3
Still working	34.6	48.7	40.7
Educational level***			
No schooling/ incomplete primary school	64.5	28.3	48.9
Primary school	16.0	20.5	17.9
Secondary school	11.5	24.0	16.8
High school and over	8.0	27.2	16.3
Marital status***			
Others (single/ separated/ divorced/ widowed)	45.2	9.2	29.7
Married	54.8	90.8	70.3
Living arrangements***			
Living with at least one child	66.0	66.9	65.5
Living alone	8.3	1.6	5.4
Living with a spouse only	13.3	24.3	18.0
Others	12.4	9.2	11.1
Household wealth indexes**			
Poor	39.0	43.2	40.8
Average	31.0	36.4	33.3
Rich	30.1	20.4	25.9
Region			
Northern	33.2	37.3	35.0
Central	21.3	18.5	20.1
Southern	45.5	44.2	44.9
Place of residence			
Rural	68.5	67.2	67.9
Urban	31.5	32.8	32.1
Perceived sufficiency of income			
Not enough	61.4	60.9	61.2
Enough	38.6	39.1	38.8

Note: *, **, *** denote P value of chi-square test < 0.05, 0.01, and 0.001 respectively. Figures do not add up to 100% because of rounding off.

4.1.3. Health conditions and lifestyle risk behaviors of older people

Figure 2 highlights the gender differences in the SRH. Women tended to perceive their status as being poor/ very poor more than men, while men were more likely to rate their health status as fair.

Figure 2: Self-rated health of older men and women, VNAS 2011 (total unweighted cases = 2,549)

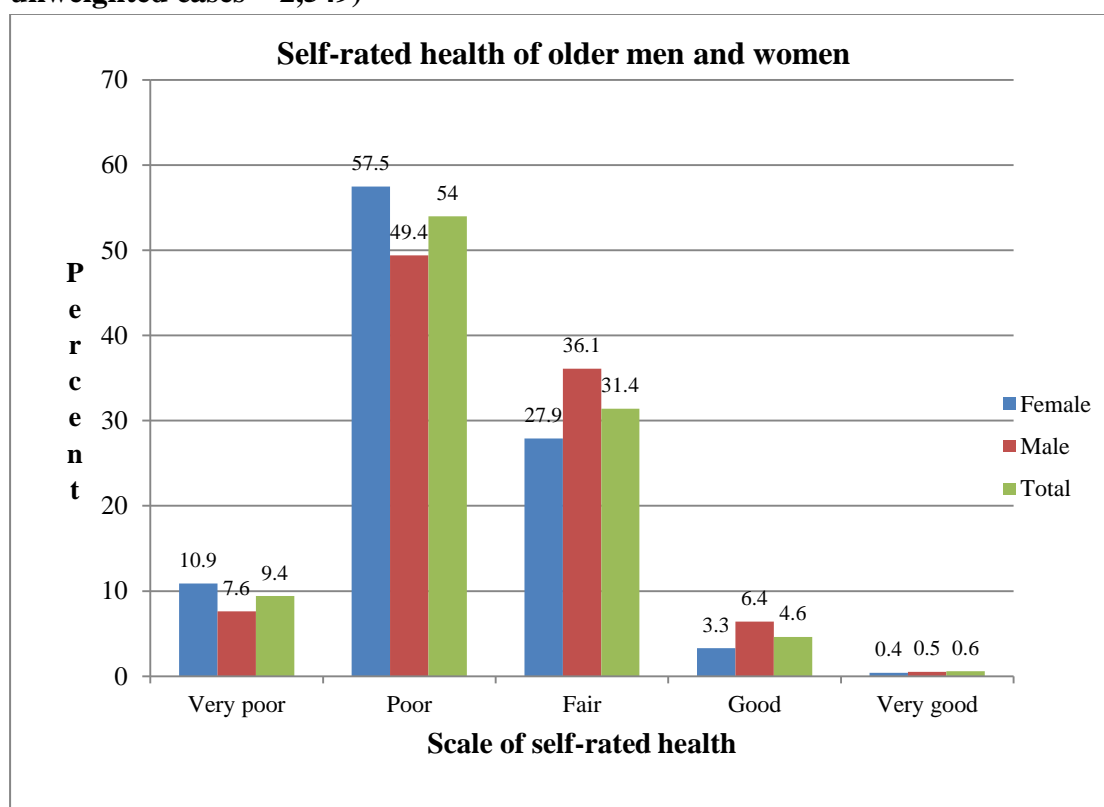


Table 7 presents the gender differences in the health conditions and lifestyle risk behaviors. Regarding health condition, the proportion of those having at least one chronic disease was higher among women (75.8%) than men (67.1).

With regards to lifestyle risk behaviors, less than one-third proportion of older respondents reported that they smoked and drank alcohol. However, smoking and drinking alcohol among older men were much more common than among older women.

Table 7: Results of descriptive analyses: Health conditions and lifestyle risk behaviors of older people by gender

Variables	Women	Men	Total (Weighted Percent)
Self-rated health**			
Very Poor	10.9	7.6	9.4
Poor	57.5	49.4	54.0
Fair	27.9	36.1	31.4
Good	3.3	6.4	4.6
Very Good	0.4	0.5	0.6
Chronic disease**			
Had no disease	24.2	32.9	28.0
Had at least one disease	75.8	67.1	72.0
Mean	1.6 (± 1.5)	1.5 (± 1.5)	
Smoking***			
No	93.8	57.3	78.1
Yes	6.2	42.7	21.9
Drinking alcohol***			
No	90.8	44.3	70.8
Yes	9.2	55.7	29.2

Note: *, **, *** denote *P* value of chi-square test < 0.05, 0.01, and 0.001 respectively. Figures do not add up to 100% because of rounding off.

4.2. Results of multi-collinearity testing

Before conducting the multivariate analyses, multi-collinearity testing was employed. Collinearity refers to a problem that two variables are near perfect linear combinations of one another. The term multi-collinearity is applied when more than two independent variables are used. Multi-collinearity can cause bias for study results as the degree of multi-collinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated¹.

There are several ways to detect multi-collinearity among independent variables such as correlation, regression, Collin, and variance inflation factor (VIF) analyses. In this study, VIF test was used to detect multi-collinearity. The higher the value of VIF, the

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more correlated the independent variables. Variables are considered as having multi-collinearity if the value of VIF is greater than 10^2 .

In order to detect multi-collinearity, two steps of analytical method were deployed. Firstly, the pooled linear regression test and VIF test are employed for the total population to see any multi-collinearity existed (Table 6). Secondly, two separate linear regression and VIF tests for men and women were used to see whether any multi-collinearity existed in each model (Table 7).

Table 8 shows that VIF's values of all variables are less than 10, which implied that there was no multi-collinearity among selected variables.

Table 8: Results of multi-collinearity test for total population: tolerance and variance inflation factors (VIFs)

Variables	Tolerance	VIF
Marital status		
Others (ref)	-	-
Current married	0.5	1.79
Gender		
Women (ref)	-	-
Men	0.5	1.9
Age group		
60-69 (ref)	-	-
70-79	0.7	1.36
80+	0.6	1.69
Place of residence		
Rural (ref)	-	-
Urban	0.7	1.36
Region		
The North (ref)	-	-
The Center	0.7	1.34
The South	0.8	1.32
Educational level		
No schooling/ Uncompleted primary school (ref)	-	-
Primary school	0.8	1.24
Secondary school	0.7	1.43
High school and over	0.6	1.58
Household wealth indexes		
Poor (ref)	-	-

Average	0.6	1.76
Rich	0.4	2.28
Household size	0.5	2.03
Perceived sufficiency of income		
Not enough (ref)	-	-
Enough	0.8	1.19
Living arrangements		
Living with at least one child (ref)	-	-
Living alone	0.6	1.75
Living with a spouse only	0.5	1.9
Others	0.9	1.12
Employment status in the past 12 months		
Not working (ref)	-	-
Still working	0.8	1.32
Smoking		
Yes (ref)	-	-
No	0.8	1.31
Drinking alcohol		
Yes (ref)	-	-
No	0.7	1.36
Chronic disease		
Had no disease (ref)	-	-
Had at least one disease	0.9	1.05

Number of observation: 2,549 cases

The results of linear regression and VIF for men and women indicated that VIF values of all independent variables were smaller than 10 (see Table 9). Therefore, all of the independent variables were assumed to be independent to each other and were used as explanatory variables in this study.

Table 9: Results of multi-collinearity test for older women and men: tolerance and variance inflation factors (VIFs)

Variables	Women		Men	
	Tolerance	VIF	Tolerance	VIF
Marital status				
Others (ref)	-	-	-	-
Current married	0.6	1.59	0.6	1.35
Age				
60-69 (ref)	-	-	-	-
70-79	0.7	1.43	0.8	1.31

80+	0.6	1.77	0.5	1.55
Place of residence				
Rural (ref)	-	-	-	-
Urban	0.7	1.42	0.8	1.4
Region				
The North (ref)	-	-	-	-
The Center	0.6	1.35	0.7	1.35
The South	0.8	1.32	0.7	1.4
Educational level				
No schooling/ Uncompleted primary school (ref)	-	-	-	-
Primary school	0.8	1.02	0.7	1.41
Secondary school	0.8	1.21	0.6	1.67
High school and over	0.8	1.31	0.5	1.82
Household wealth indexes				
Poor (ref)	-	-	-	-
Average	0.6	1.75	0.6	1.78
Rich	0.5	2.25	0.5	2.15
Household size				
	0.4	2.02	0.5	2.1
Perceived sufficiency of income				
Not enough (ref)	-	-	-	-
Enough	0.8	1.23	0.8	1.18
Living arrangements				
Living with at least one child (ref)	-	-	-	-
Living alone	0.8	1.31	0.8	1.31
Living with a spouse only	0.7	1.35	0.8	1.2
Others	0.8	1.21	0.9	1.9
Employment status in the past 12 months				
Not working (ref)	-	-	-	-
Still working	0.7	1.21	0.7	1.34
Smoking				
Yes (ref)	-	-	-	-
No	0.8	1.19	0.8	1.13
Drinking alcohol				
Yes (ref)	-	-	-	-
No	0.9	1.16	0.9	1.11
Chronic disease				
Had no disease (ref)	-	-	-	-
Had at least one disease	0.9	1.14	0.9	1.11

Number of observation: 2,549 cases

4.3. Results of logistic regression for the total sample population

In order to see whether there is any difference between older men and women in evaluating their health status, the logistic regression analysis was employed. As mentioned in Chapter 2, men and women have differences in lifestyle risk behaviors, such as men are more likely to smoke and drink alcohol more than women. Health factors (chronic diseases) also are found to differ among men and women. For example, women tend to suffer from chronic diseases more than men (see Section 2.2.1 and 2.2.2 in Chapter 2). Aiming to provide a clear relationship between gender and lifestyle risk behaviors and health factors (chronic diseases), this study performed two logistic regression models. In the first model, all socio-demographic characteristics were included. In the second model, lifestyle risk behaviors and health factors were added. Thus, we can see how SRH for each gender is affected by lifestyle risk behaviors and health factors after controlling for all socioeconomic backgrounds.

In both logistic regression models, self-rated health was grouped into two categories: poor and good health. Good health was treated as reference groups.

The results of the model 1 (Table 10) showed that men were less likely to report poor health status than women, but it was statistically insignificant. The results also showed that region, educational level, perceived sufficiency of income, and employment status had a statistically significant association with poor SRH.

In the second model, when lifestyle risk behaviors and health factors were added, the results showed a statistically significant difference in reporting poor health status among men and women at p -value <0.05 . The results also revealed that the direction of reporting poor health status among men was inversed as compared with the model 1. Therefore, the null hypothesis that men and women rated their health status similarly was rejected. This implied that lifestyle risk behaviors and health factors were correlated with gender. Therefore, further investigation on variables' influencing on SRH comparing between male and female was needed.

Regarding other socioeconomic variables, although the coefficients were changed when the lifestyle risk behaviors and chronic disease were added into the model, the significant level and direction of the relationship remained the same (model 2). In particular, those elderly living in the Center were more likely to report poor SRH than those living in the North. Those OPs with higher educational level were less likely to report poor SRH.

It is interesting to see that those with higher household wealth indexes perceived their health status more negatively than those with lower household wealth indexes. The results also showed that working had a positive impact on SRH. Indeed, when compared with non-working, working OPs were less likely to perceive poor health status. Similarly, those OPs who did not drink alcohol were less likely to report poor health status than their counterparts.

For chronic disease, the older persons with at least one chronic disease were more likely to report poor health status than those with no chronic disease.

Table 10: Multiple logistic regression models of factors associated to SRH for all older persons in Vietnam, 2011

Variables	Coefficients	
	Model 1	Model 2
Gender		
Women (ref)	-	-
Men	-0.05	0.5*
Age group		
60-69 (ref)	-	-
70-79	-0.03	-0.2
80+	0.07	-0.01
Place of residence		
Rural (ref)	-	-
Urban	-0.3	-0.3
Marital status		
Others (ref)	-	-
Currently married	-0.2	-0.3
Region		
The North (ref)	-	-
The Center	0.4	0.5*
The South	-0.1	-0.1
Educational level		
No schooling/ Uncompleted primary school (ref)	-	-
Primary school	-0.6*	-0.6**
Secondary school	-0.84**	-0.9**
High school and over	-0.9**	-0.9**
Household wealth indexes		
Poor (ref)	-	-
Average	-0.02	0.1
Rich	0.2	0.4

Household size	-0.09	-0.09
Perceived sufficiency of income		
Not enough (ref)	-	-
Enough	-0.6***	-0.6**
Living arrangements		
Living with at least one child (ref)	-	-
Living alone	0.02	-0.1
Living with a spouse only	-0.2	-0.1
Others	-0.3	-0.3
Employment status in the past 12 months		
Not working (ref)	-	-
Still working	-0.64**	-0.5*
Smoking		
Yes (ref)	-	-
No		-0.2
Drinking alcohol		
Yes (ref)	-	-
No		-0.9***
Chronic disease		
Had no disease (ref)	-	-
Had at least one disease		0.9***

Number of observation: 2,549 cases

Note: *, **, *** denote P value < 0.05 , 0.01 , and 0.001 respectively. – indicates not applicable. Figures do not add up to 100% because of rounding off.

4.4. Results of the factors associated with SRH among older men and women

Table 11 presents the results of the multiple logistic regression models of the factors associated to SRH among older women and men.

All eleven independent variables are put into the logistic regression model to determine their associations with dependent variables. The results showed that place of residence, region, educational level, perceived sufficiency of income, employment status, alcohol consumption, and having chronic disease are significantly associated with poor SRH in women. For men, only perceived sufficiency of income, drinking alcohol, and having chronic disease were statistically associated with SRH.

The factors associated with SRH of both older men and women

Three predictor variables were found to be statistically significantly associated with health status of both older men and women in this study, namely: perceived sufficiency of income, drinking alcohol, and having chronic disease.

The odds of reporting poor SRH were significantly lower among those who perceived sufficiency of income in both women and men. Those who perceived sufficiency of income were less likely to report poor SRH than those who perceived insufficiency of income. Such relationships were found in both the logistic regression models for older women and men. This may be due to the fact that those older people who have sufficient income are more likely to be able to afford daily living expenditures or medical care or to keep them healthy (Carlson et al., 2013; Fabíola Bof et al., 2012).

Although the proportion of those drinking alcohol was rather small in the selected sample, the results of this study still showed a statistically significant association between drinking alcohol and poor SRH in both gender. For example, the odds of those who were drinking alcohol were more likely to report poor health status than those who did not drink alcohol. Despite a limitation of cross-sectional data, the results of this study also confirmed a negatively significant association between this risk behavior and poor SRH (Hoang et al., 2008).

In this study, the principal predictor of poor SRH health among older men and women in Vietnam was whether having a chronic disease or not. The number of chronic disease has been found to be one of the strongest determinants of poor SRH in a number of studies on population aging (Austad, 2006; Haseen et al., 2010; Hoang et al., 2008). The finding in Table 11 confirmed the findings of previous research. Both older women and older men with a chronic disease were more likely to report poor health status (2.8 times and 2.4 times, respectively). The results of the logistic regression analysis of the association between having chronic disease in this study were consistent with previous studies on aging in Vietnam (Dam et al., 2010; Hoang et al., 2008). A possible explanation for such relationship is that chronic diseases are diseases that cannot be cured and can lead to various symptoms and physical suffering. Therefore, those with chronic disease tend to report poor health status. (Yach et al., 2005, Phaswana-Mafuya, Peltzer, Chirinda, Musekiwa, et al., 2013).

The factors associated with the SRH of older women only

Besides, perceived sufficiency of income, drinking alcohol, and having chronic disease, the results of the multivariate analysis (Table 11) also indicated that place of

residence, region, educational level, and employment status have statistically significant association with SRH of older women.

The probability of reporting poor SRH was less likely to be seen in those living in urban areas as compared to those living in rural areas in both genders. However, statistical significance was found in women only, not in men. Specifically, older women living in urban areas were less likely to report poor health status than those living in rural areas. This may be differences in health care infrastructure, services, and accessibility between urban and rural areas. For example, those who live in rural areas in Vietnam, in general, are less likely to access to health care information and services, as well as public welfare (MoH, 2003, and Nguyen et al., 2007, and UNFPA, 2011). In terms of healthcare quality, a higher prevalence of using low-quality services was found in OPs living in rural areas (Giang, 2008). Moreover, a previous study also pointed out that rural-to-urban migration among younger generations can be significantly associated with the health status of OPs in both spiritual and material senses. Such a phenomenon may cause social isolation and a lack of a social network between OPs and their family members (AgeWellFoundation., 2010).

Region was categorized into three dummy variables: the North (reference category), the Center, and the South. The results revealed that, for women, those living in the Center and the South were 1.8 and 1.2 times more likely to report poor health status than those living in the North, respectively. However, the results did not find any statistical significance when compared between the South and the North. This may be due to economic variation between the regions, where the central part is less economically developed than the northern part (Oversee Development Institute., 2011). Thus, disadvantage in regional development may have an impact on the healthcare facilities and services which in turn lead to poor health status of those living in the center. Another explanation is that the center normally suffers harshly natural conditions and more vulnerable natural disasters that cause huge damages in terms of economic and human losses than the North (Le, 2013).

Educational level was grouped into four categories: no schooling/ incomplete primary school (reference category), primary school, secondary school, and high school and over. In this study, educational level was found to be positively associated with poor SRH in both genders. However, statistical significance was found in older women only. Specifically, women with primary school, secondary school, or high school education and over were less likely to perceive poor SRH than those with no education or incomplete primary school. Such finding implies that educational level may be a more important determinant of good health for women than men. This reflects the fact that higher education is probably associated with higher knowledge on health issues, diet, and disease prevention, resulting in reductions in sickness and

unhealthy behaviors that lead to better health status. Indeed, this finding supports the previous research finding about the relationship between education and SRH (Hoang, Byass, Nguyen, et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Musekiwa, et al., 2013; T. A. Khan & Flynn, 2015).

The likelihood of reporting poor SRH was lower among those who were still working in both genders, but statistical significance was shown in women only. Older women who were working were 0.5 times less likely to report poor SRH than those who were not working. Consistent with a previous study, this study revealed that unemployment was seen to be significantly associated with poor SRH in women, but not in men (Molarius et al., 2012). This could be explained by the fact that working gives women more opportunities to join social and economic activities, which make them more active and result in a better health status (Molarius et al., 2007). In addition, employment gets women out of household work and gives them a greater chance to control their lives. It also has been argued that working reflects an economically independent status of individuals and a previous study has suggested that those who were economically dependent had a higher odds of reporting poor health status as compared to those who were economically independent (Singh et al., 2013).

Table 11: Results of Multiple logistic regression models of factors associated to SRH among older women and men in Vietnam, 2011

Variables	Women		Men	
	Odds Ratios	95% CI for OR	Odds Ratios	95% CI for OR
Age group				
60-69 (ref)	-	-	-	-
70-79	0.9	[0.540-1.733]	0.8	[0.463-1.268]
80+	1.3	[0.726-2.566]	0.7	[0.327-1.584]
Place of residence				
Rural (ref)	-	-	-	-
Urban	0.7*	[0.411-1.041]	0.9	[0.520-1.522]
Marital status				
Others (ref)	-	-	-	-
Currently married	0.9	[0.623-1.465]	0.6	[0.190-1.875]
Region				
The North (ref)	-	-	-	-
The Center	1.8*	[1.011-3.303]	1.4	[0.754-2.518]
The South	1.2	[0.745-1.955]	0.6	[0.315-1.105]
Educational level				
No schooling/ Uncompleted	-	-	-	-

primary school (ref)				
Primary school	0.4**	[0.213-0.729]	0.9	[0.432-2.103]
Secondary school	0.5*	[0.243-0.874]	0.4	[0.174-1.992]
High school and over	0.4**	[0.659-0.830]	0.5	[0.214-1.202]
Household wealth indexes				
Poor (ref)	-	-	-	-
Average	1.1	[0.820-2.729]	1.1	[0.619-2.992]
Rich	1.5	[0.835-2.812]	1.5	[0.705-3.211]
Household size				
	0.9	[0.782-0.979]	1.0	[0.864-1.202]
Perceived sufficiency of income				
Not enough (ref)	-	-	-	-
Enough	0.5*	[0.314-0.924]	0.6*	[0.373-0.955]
Living arrangements				
Living with at least one child (ref)	-	-	-	-
Living alone	1.2	[0.431-2.348]	0.5	[0.133-1.886]
Living with a spouse only	0.7	[0.398-1.384]	1.2	[0.589-2.346]
Others	1.1	[0.584-2.011]	0.5	[0.235-0.933]
Employment status in the past 12 months				
Not working (ref)	-	-	-	-
Still working	0.5**	[0.267-0.764]	0.8	[0.417-1.399]
Smoking				
Yes (ref)	-	-	-	-
No	1.1	[0.434-2.482]	0.8	[0.488-1.382]
Drinking alcohol				
Yes (ref)	-	-	-	-
No	0.4*	[0.201-0.798]	0.4**	[0.201-0.691]
Chronic disease				
Had no disease (ref)	-	-	-	-
Had at least one disease	2.4***	[1.583-3.569]	2.8***	[1.677-4.820]

Number of observation: 2,549 cases

Note: *, **, *** denote P value < 0.05 , 0.01 , and 0.001 respectively. – indicates not applicable. Figures do not add up to 100% because of rounding off.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

Health outcomes are important indicators for the well-being of OPs. Moreover, health is a dynamic process as it changes over time, deteriorating with age. Therefore, it is essential to understand the health patterns and factors influencing an individual's health status. By doing so, appropriate health intervention and policy needs can consider factors that influence health outcomes of OPs. This study aims to provide overview information on health status's pattern and to determine the underlying factors that could influence the health status of older men and women in Vietnam.

5.1. Summary of significances from this study

Results of descriptive analyses showed that the prevalence of reporting poor/ very poor health was found to be higher in women (68.4%) than men (57.0%). The findings are consistent with previous studies on subjective health measurement conducted in Vietnam and Asian countries (Haseen et al., 2010; Hoang, Byass, Nguyen, et al., 2010; Singh et al., 2013; T. A. Khan & Flynn, 2015; Teerawichitchainan, 2010). Gender differences in health have been well-established in international literature (Molarius et al., 2007; Molarius et al., 2012; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; Singh et al., 2013). Possible explanations for this could be that women are more vulnerable to non-fatal health problems that weaken their health status. In addition, as compared to men, women are seen to have disadvantages in financial security that results in less access to healthcare services, especially in rural areas.

SRH, an important predictor of health, is determined by several factors. Results of the multiple logistic regression analysis showed that, For women, those with higher educational levels, living in an urban area, living in the North (comparing with those living in central), perceived sufficiency of income, still working, did not drink alcohol, and has no chronic diseases, have a lower probability of reporting a poor health status. For men, those with a perceived insufficiency of income, drinking alcohol and having at least one chronic disease are more likely to perceive they had a poor health status (see Table 10).

Positive (+) and negative (-) signs provided in the summary table show the direction of the relationship between independent variables and SRH in the multiple logistic

regression models for older men and women. The positive sign indicates a higher probability of reporting poor SRH, while the negative sign reflects a less likelihood of reporting poor SRH. A tick (\surd) sign means it supports the hypothesis of this study that the factors associated with SRH are likely to differ by gender. A cross (X) sign indicates a different direction from the study hypothesis.

Table 12: Factors influencing health status among older men and women from multiple logistic regression results

Variables	Women	Men	Hypothesis
Place of residence			
Rural (ref)	Ref	Ref	
Urban	-*	-	\surd
Region			
The North (ref)	Ref	Ref	-
The Center	+*	+	\surd
The South	+	-	\surd
Educational level			
No schooling/ Uncompleted primary school (ref)	Ref	Ref	-
Primary school	-**	+	\surd
Secondary school	-**	-	\surd
High school and over	-**	-	\surd
Perceived sufficiency of income			
Not enough (ref)	Ref	Ref	
Enough	-*	-*	X
Employment status in the past 12 months			
Not working (ref)	Ref	Ref	
Still working	-**	+	\surd
Drinking alcohol			
Yes (ref)	Ref	Ref	
No	-*	-**	X
Chronic disease			
Had no disease (ref)	Ref	Ref	
Had at least one disease	+***	+***	X

Note: (+) denotes more likely to report poor health status, (-) denotes less likely to report poor health status, (\surd) means support the hypothesis, (x) indicates a different direction of the hypothesis, () indicates significant level, (ref) indicates reference category.*

The results of this study suggest that the determining factors of health status among older men and women are different. Specifically, seven out of eleven predictor

variables were found to be determinants of health status of older women, while only three factors are associated with SRH for older men. In addition, chronic disease was found to be strongest predictor of health status in both genders.

The results of this study showed that age, household wealth indexes, living arrangements, and smoking were not statistically significantly associated with health status in both genders.

In contrast with previous studies, the results showed that age was seen to be insignificantly associated with poor health status in both genders. The results of the descriptive analysis showed that the prevalence of having at least one chronic disease was very high among both genders and a previous study has indicated that patients suffering from chronic diseases took their adaptability and acceptability of sickness into consideration while evaluating their health status. In other word, the role of adaptability and acceptability of sickness may have an influence on the health status of older age groups (> 70 years old).

Most previous studies in Vietnam and internationally have shown significant impacts of household wealth indexes on SRH. For example, the better-off were less likely to perceive poor health status than the poor (Hoang, Byass, Nguyen, et al., 2010; Phaswana-Mafuya, Peltzer, Chirinda, Kose, et al., 2013; Razzaque, Nahar, Akter, & Kim, 2010; Teerawichitchainan, 2010). However, in this study, such significance was not apparent. This finding is in line with a previous study in Vietnam that that SES had no impacts on health status (N. Ng, P. Kowal, et al., 2010). Moreover, the findings of household wealth indexes and perceived sufficiency of income in this study supported the above argument that subjective economic measurements may play a more important role on the health status of OPs than objective economic measurements.

Living arrangements were recoded into four dummy variables: living with at least one child (reference category), living alone, living with a spouse only, and others. The results did not show any statistical significance in both genders, but revealed a different association between living arrangements and poor SRH among men and women. In particular, those living alone or others were found to be more likely to report poor health status as compared to living with at least one child among women. For example, those living alone, or others were 1.2 times, or 1.1 times more likely to report poor health status as compared to those living with at least one child, respectively. Those living with a spouse only were less likely to report poor health status than those in reference category. On the other hand, for men, those living alone, or others were 0.6, or 0.5 times less likely to perceive poor health status than those living with at least one child, respectively. This finding implies that living with at

least one child is a more important determinant of good health for women than men and living with a spouse results in a better health among older women. This could be explained by the fact that living alone in developing countries may reflect an individual's vulnerable status in terms of financial insecurity and susceptibility, which in turn may influence the health status of OPs (UNFPA., 2012). Regarding gender differences, although women are seen to have disadvantages in economic activities, they tend to have stronger social networks than men at an old age (UNFPA., 2012). Moreover, it also has been evident that older women are more likely to receive material and spiritual support from their adult children than older men and that may result in better health status among women when they co-reside with adult children (UNFPA., 2012). A study has indicated that being a spouse has a positive effect on the well-being of OPs (Knodel & Chayovan, 2008) because spouses are seen to help and support each other in daily living and they also share their happiness, difficulties in life, and take care of each other when in need (UNFPA, 2011). In this study, living with a spouse only was the most important determinant of health status in women.

Inconsistent with previous studies, the multivariate results did not find any significant association between marital status and SRH. Findings on the association between SRH and marital status remains debated in the literature as previous studies have shown inconsistent findings. For example, studies by N.Ng in (2010) and Phaswana-Mafuya in (2013) showed that marital status had strong effect on health status. In contrast, several studies pointed out that there was no relation between marital status and SRH (Hoang, Byass, Nguyen, et al., 2010; T. A. Khan & Flynn, 2015). This implies that the association between marital status and SRH might vary by different setting contexts.

In contrast to expectation, smoking was shown to be a statistically insignificant association with poor SRH in both men and women in this study. However, this revealed the same pattern with a previous study that those who did not smoke had a lower likelihood of reporting poor health status than smokers (Hoang et al., 2008).

5.2. Conclusion

In summary, this study provides cross-sectional evidence on patterns of subjective health measurements among older men and women in Vietnam. This study also provides how gender differences in health status could be interpreted by socio-demographic factors, lifestyle risk behaviors, and chronic diseases. The findings support existing knowledge that there is inequality in health status in terms of gender differences. In particular, men perceive their health status to be better than women. The findings also reveal that there are variations on the contribution of the selected variables (demographic characteristics, socio-economic factors, lifestyle risk

behaviors, and chronic disease) on health status among older men and women, of which chronic disease has the strongest predictive impact on perceived health status in both genders. Moreover, the study also suggests that economic circumstances are more critical for women's health than for men's.

5.3. Limitations of the study

Several limitations in this study should be taken into account. Firstly, since this study was a cross-sectional study, it could not discern the cause-effect relationships between SRH and selected factors. Secondly, low educational levels and the presence of impaired cognition in older people might have led to inaccuracies in reporting their health status. Thirdly, the question on SRH may have some limitation because it did not take a time reference into account. Thus the respondent may evaluate their health status with different periods of time.



CHAPTER 6

POLICY RECOMMENDATIONS

This study examined gender differences in health issues by using subjective health measurements among OPs in Vietnam in 2011. The study found that the prevalence of reporting poor health status was seen to be more frequently in women than men. The study also provided findings of the association between SRH and associated factors (demographic characteristics, socio-economic factors, lifestyle risk behaviors, and chronic diseases) among older men and women.

Recognizing the huge burden of chronic diseases on OPs, the Vietnamese government issued circular No. 35/2011/TT-BYT dated 15 October 2011 on care for OPs. The main measures are:

- Circulating and diffusing knowledge of health prevention and promotion by using leaflets, books, documents, banners, slogans, and so on, for OPs. Health materials should focus on the most common diseases of OPs.
- Providing instructions on health prevention skills, treatment, and self-care for OPs.
- Organizing regular health examinations and establishing health-recorded files to follow up health conditions of OPs.
- Establishing health-recorded files on chronic diseases among OPs to manage and control.

Keeping older people healthy is very essential because although being less active in economic sectors, older people make significant contributions in many other ways. A recent study has shown that older people still remain active in daily living and play an important role in the household unit such as, providing housing for family members since normally lands are owned by older people, or by providing day care for grandchildren to accelerate the parent's ability to work either locally or remotely, or by minding and taking care of household when their children were absent (Knodel and Nguyen, 2015). In addition to that view, in Decision No 1781/ 2012/QD-TTg dated 22 November 2012, the Prime Minister approved a national program on the elderly population of Vietnam in the 2012-2020 which has three specific objectives as follows:

- Firstly, promoting the roles and experiences of OPs in community and society, as well as creating opportunity for them to participate in cultural, social,

educational, economic, and political activities that meet with their needs and abilities.

- Secondly, strengthening physical and mental health for OPs; improving the quality of the healthcare system for OPs; providing treatment and management on chronic diseases.
- Thirdly, improving the quality of life for OPs in terms of material support; completing aid policy and social protection to ensure minimum living standard of OPs.

To attain active aging, promoting the role and experiences of OPs are crucially needed in terms of families, communities, and society as a whole. Among these, keeping OPs healthy should be given priority. Given that, Vietnamese government has implemented a number of policies on promoting health status of OPs. However, most of them were not concern about gender differences. By conducting this research, I would like to propose some policy recommendations as follows:

Firstly, chronic disease was determined as the most important predictor for health status of both older men and women. In Vietnam, healthcare centers designated for older population are still limited, community-based care is not well-established and home-based care is still in very early development stage, while the aging process is occurring rapidly. Thus, more efforts from policy makers and government should be given to:

- Upgrading and/or establishing new hospitals/healthcare stations designated for older people with modern equipment systems to ensure the quality of healthcare for OPs. In addition, geriatric training for healthcare providers/ staff is increasingly needed to cope with the high prevalence of chronic diseases.
- A previous study showed that family was the most important health care resource of OPs in Vietnam (Le et al., 2011). However, this institution is weakening due to a growing transformation in family structure from extended families to nuclear ones. As well, temporary rural-to-urban migration of young generations is leading to an increase in skip-generation (grandparents living with grandchildren only) (UNFPA, 2011). Therefore, providing home-based and community-based care for OPs will be increasingly needed in the future to deal with a lack of support by family and increasing prevalence of poor SRH and chronic disease found in this study.

Long-term impact is critical for younger generations. In order to reduce the high prevalence of chronic disease and to achieve healthy aging in the future, it is essential to change health behaviors and to raise awareness of individuals about health promotions as follows:

In order to reduce or delay chronic disease in the old age, health promotion for OPs and younger generations should be encouraged:

- Providing appropriate nutrition programs for people by promoting well-balanced and healthy diets. For example, encourage people to have sufficient fruit and vegetable, low-fat, low-cholesterol foods in their daily meals. In addition, warning people to avoid eating food substances that may be associated with chronic diseases, such as fatty, salty and sugary foods.
- Encouraging people to do physical exercise at least 30 minutes per day by walking or riding a bicycle to stay physically active.
- Encouraging people to have health examination regularly and, by doing so, latent health problems like chronic diseases can be detected in early stages.

Secondly, educational level was shown to have significant impact on SRH, especially in women. This may be because older women may be more disadvantaged to educational levels than men due to preference given to sons in that past. This has resulted in less access to health information and insufficient knowledge on health care and health prevention and suggests that the government should:

- Establish and expand elderly clubs so that OPs can communicate, share information, and help each other. Cultural activities that are appropriate for both genders should be encouraged with involvement of older women.
- Provide and enhance healthcare information and healthcare education to OPs through mass media with priority given to older women.
- Vietnam has witnessed a huge improvement in education and gender inequality in education has been substantially diminished. However, in order to achieve active and healthy aging for successive generations, health education (e.g., physical and mental health), health nutrition (e.g., healthy diet), and health prevention (e.g., knowledge about chronic disease and disability) should be spread and strengthened for younger generations.

Thirdly, promote and encourage OPs to participate in the workforce. Once having economic secure, individuals can give commands on their own lives and do not have to rely on others in terms of economic dependence. There should be:

- Training for specific and suitable job skills and creation of job opportunities for both genders, especially for older women, as they are more vulnerable to economic than older men. By doing so, they can raise their income resources and reduce inequality in workforce.

Finally, social security and welfare systems should be given directly to vulnerability groups (e.g., older women and those living in rural areas) and free health insurance cards for all OPs should be developed because the cost of treatment is very high.

Suggestions for future research

As identified in this study, age was seen to be insignificantly associated with poor health status and an optimistic trend on SRH was found in older age groups in both genders. Therefore, further studies are needed to explore the interaction between these two variables.

As mentioned in the limitation section, the question on SRH should have a time reference in the future work in order to achieve a better indicator.

Due to limitation of cross-sectional data, further panel studies are essential to determine the cause-effect relationship of SRH and its associated factors.



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APPENDIX



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