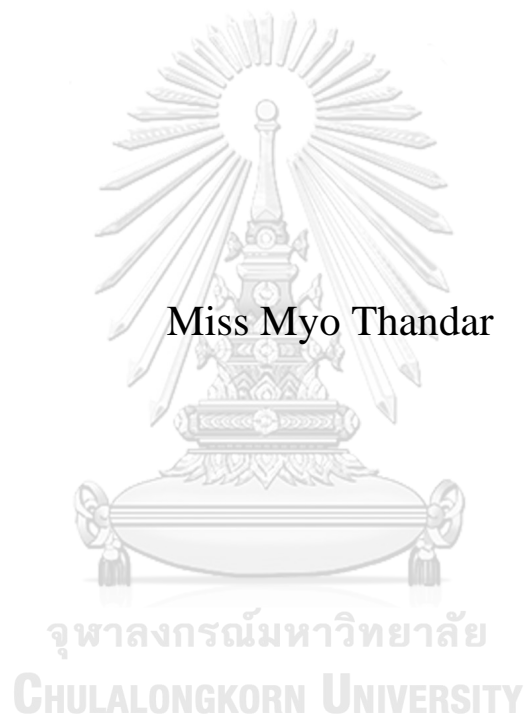# The Socio-economic Determinants of the Life Satisfaction of Older Persons in Myanmar in 2019

Miss Myo Thandar

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in Demography
COLLEGE OF POPULATION STUDIES
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ปัจจัยทางเศรษฐกิจและสังคมกับความพึงพอใจในชีวิตของผู้สูงอายุในเมียนมาร์ ปี 2562

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ประเทศเมียนมาร์มีการเปลี่ยนแปลงทางด้านประชากรอย่างมีนัยสำคัญและมีสัดส่วนของประชากรสูงอายุที่เพิ่มมากขึ้นโดยประเทศเมียนมาร์กำลังเผชิญกับความท้าทายในการให้ความคุ้มครองทางสังคมแก่ผู้สูงอายุที่เพิ่มขึ้นเช่นเดียวกับประ เทศอื่นๆที่เข้าสู่สังคมสูงวัยอย่างรวดเร็ว เมื่อเข้าสู่วัยที่อายุมากขึ้นสุขภาพกายและความสามารถในการทำหน้าที่ของร่างกายย่อมเสื่อมสภาพลง ส่งผลให้ผู้สูงอายุส่วนใหญ่มีความพึงพอใจในชีวิตลดลง ดังนั้นการศึกษาปัจจัยที่ส่งผลต่อการรับรู้ถึงความพึงพอใจในชีวิตของผู้สูงอายุจึงเป็นเรื่องสำคัญ การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยทางเศรษฐกิจและสังคมที่กำหนดความพึงพอใจในชีวิตของผู้สูงอายุในประเทศเมียนมาร์ และพิจารณาถึงความแตกต่างระหว่างเพศของผู้สูงอายุในประเด็นนี้ ข้อมูลที่ใช้ในการศึกษาเป็นข้อมูลทุติยภูมิแบบภาคตัดขวางจากการสำรวจสำมะโนประชากรประเทศเมียนมาร์ปี 2019 กลุ่มตัวอย่างที่ใช้ในการศึกษา คือ ผู้สูงอายุที่มีอายุ 60 ปีขึ้นไปจำนวน 65,065 คน ด้วยการวิเคราะห์ข้อมูลแบบตัวแปรเดียว (univariate) การวิเคราะห์เพื่อหาความสัมพันธ์ระหว่างสองตัวแปร (bivariate) และการวิเคราะห์พหุตัวแปร (multivariate) การพิจารณาปัจจัยที่เกี่ยวข้องกับความพึงพอใจในชีวิตประเภทต่าง ๆ อันได้แก่ ไม่พึงพอใจ พึงพอใจปานกลาง พึงพอใจ และพึงพอใจมาก ใช้สมการถดถอยโลจิสติกแบบพหุนาม (Multinomial logistic regression) และในการวิเคราะห์จากมุมมองด้านความแตกต่างทางเพศ ใช้การวิเคราะห์สมการถดถอยโลจิสติกแบบไบนารี่ (binary logistic regression) ผลการวิจัยแสดงให้เห็นว่าถิ่นที่อยู่อาศัยและการอาศัยอยู่กับบุตรอย่างน้อยหนึ่งคนมีความสำคัญอย่างยิ่งต่อความพึงพอใจในชีวิตของผู้สูงอายุ การมีการศึกษาที่สูงขึ้น การมีรายได้สูงขึ้น การอาศัยอยู่ในบ้านที่ดีกว่า และการมีสุขภาพที่ดีกว่า ล้วนเป็นปัจจัยสำคัญในการกำหนดความพึงพอใจในชีวิตของผู้สูงอายุ โดยมุมมองด้านความแตกต่างทางเพศพบว่าปัจจัยด้านรูปแบบที่อยู่อาศัยและกรรมสิทธิ์ในที่อยู่อาศัยมีความสัมพันธ์กับความพึงพอใจในชีวิตของผู้สูงอายุเพศหญิง แต่ไม่มีความสัมพันธ์กับความพึงพอใจในชีวิตของผู้สูงอายุเพศชาย สำหรับผู้สูงอายุเพศชาย การช่วยเหลือกิจการในครอบครัวมีความสัมพันธ์เชิงบวกกับความพึงพอใจในชีวิต โดยความสัมพันธ์ นี้ไม่พบในกร ณีผู้สูงอายุเพศหญิงข้อค้นพบที่ได้จากการศึกษาชี้ให้เห็นว่านอกจากปัจจัยทางเศรษฐกิจและสังคมแล้ว ความพึ งพอใจในชีวิตของผู้สูงอายุยังมีความสัมพันธ์กับปัจจัยด้านถิ่นที่อยู่อาศัย ปัจจัยด้านรูปแบบการอยู่อาศัย และปัจจัยด้านสุขภาพซึ่งมีนัยยะเชิงนโยบายในแง่ของกลยุทธ์ด้านการคุ้มครองทางสังคมเพื่อเพิ่มความพึงพอใจในชีวิตของผู้สูงอายุในประเทศเมียนมาร์

สาขาวิชา   ประชากรศาสตร์

ปีการศึกษา   2565

ลายมือชื่อนิสิต ....

ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

Myo Thandar : The Socio-economic Determinants of the Life Satisfaction of Older Persons in Myanmar in 2019. Advisor: Asst. Prof. PATAPORN SUKONTAMARN, Ph.D.

Myanmar has undergone significant demographic changes, and the share of the older population has increased. Myanmar is facing the challenge in providing social protections to the increasing number of older people, like many other rapidly-ageing societies. As people get older, their physical health and functional ability deteriorate and, as a result, their life satisfaction also declines in most cases. Therefore, it is crucial to consider factors that contribute to the perception of life satisfaction among this venerable cohort. This study explored the determinants of life satisfaction of older persons and investigated whether there are gender differences in the determinants of life satisfaction of older persons in Myanmar. This study used secondary data from the 2019 cross-sectional Myanmar Inter-censal Survey. This study analysed 65,065 older persons aged 60 and over using univariate, bivariate, and multivariate analysis. Multinomial logistic regression was used to examine the factors associated with various types of life satisfaction, namely unsatisfied, neutral, fairly satisfied, and very satisfied. Binary logistic regression was used to approach this association from a gender perspective. This study reveals that an urban setting and living with at least one child are essential factors contributing to higher life satisfaction of older persons. Having higher education, having higher household income, living in a better house, and having a better health status are the key factors in determining the life satisfaction of older persons. From the gender perspective, living arrangement patterns and house ownership status are associated with the life satisfaction of older women but not older men. For men, working as own account workers is positively associated with life satisfaction; however, this association does not hold for women. This study suggests that, in addition to socio-economic factors, the life satisfaction of older persons is also associated with area of residence, living arrangement, and health-related factors. The results have policy implications in terms of social protection strategies to improve the life satisfaction among older persons in Myanmar.

Field of Study:	Demography	Student's Signature	....
Academic Year:	2022	Advisor's Signature	....

ACKNOWLEDGEMENTS

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CHAPTER I: INTRODUCTION

1.1   Background of the Study

With the demographic transition, the process in which the share of older people increases and the share of children and youth decreases is called the ageing of the population. The ageing of the population is now a global phenomenon caused by the transition from high to low levels of fertility and mortality. The pace and magnitude of these birth declines and life expectancy increases determine the numbers and relative size of the older population now and in the future. Every country and/or region in the world has or will have an experience with the ageing of the population. Globally, the population of older persons aged 60 years and over numbered one billion in 2020, more than twice as large as in 1980, when there were 382 million older persons worldwide. The number of persons aged 60 years and over is expected to double again by 2050. The number of persons aged 80 years and over is projected to triple between 2020 and 2050 (World Health Organisation, 2021).

In the Asian region, there are significant differences among the population of East, Southeast, and South and Central Asia. With a slower-growing in population, the demographic transition will result in population ageing, which can increase the median age in a population. The demographic transition is most prominent in East Asia, with the slowest population growth rate (0.28 per cent per annum) and least prominent in South and Central Asia, with the highest growth rate (1.21 per cent per annum) and around average-growth rate (1 per cent per annum) in Southeast Asia (World Population Review, 2020). The population's median age in Asia was 32.0 years as of Worldometers, 2020. East Asia had the highest median age of 39.4 years, followed by Southeast Asia (30.2 years). Comparatively, the population's median age in South and Central Asia was 27.6 years (Worldometers, 2020). Although Southeast, and South and Central Asian countries are still young in the median age, these regions will host the majority of the older population in the world by 2035. As a result, several Asian countries will experience a rapid alteration from young to old in their demographic structure. The older population aged 60 years and over in Asia is projected to be 1.3 billion by 2050 (United Nations, 2017a). Nowadays, in some Asian countries such as Singapore, Malaysia, Vietnam and Thailand, the older

population is growing, and the proportion of the older population is increasing compared to the child and working-age population due to the decline in fertility and the increase in life expectancy.

As the global demographic trend, Myanmar, one of the Southeast Asian countries, has started to experience an increase in the older population. According to the 2019 Myanmar Inter-censal Survey, the estimated population aged 60 years and over was 5.1 million (10.1 per cent of the total conventional household population). The number of males was about 2.1 million, and the number of females was about 3.0 million. The number of older persons is expected to double again by 2050, when it is projected to reach the "Aged Society". The total population has been growing at an increasingly slower rate, but the proportion of the older population has been accelerating quickly (Department of Population, 2017).

Figure 1.1: Share of Myanmar population by age group: medium variant projection, 2015-2050
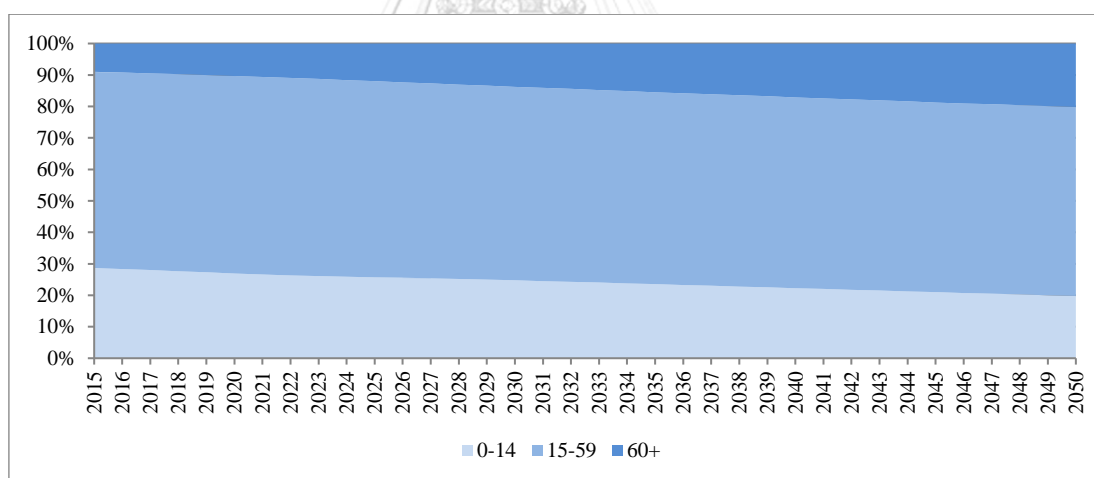
Source: Department of Population, 2017

In terms of the share of the Myanmar population, Figure 1.1 illustrates the percentage of the population divided into three age groups: (1) the older population aged 60 years and over, (2) the working-age population aged between 15 and 59 years old and (3) the child population aged between 0 and 14 years old. The total population will grow at less than 1 per cent a year between 2015 and 2050; meanwhile, the population aged 60 and over will be at an annual rate of 3 per cent or more. The

population in the oldest ages, 80 years and over, will increase even faster, at about 5 per cent or more (Department of Population, 2017).

Based on the share of the population (see Figure 1.1), the critical indicators for population ageing can be observed in Figure 1.2. The old-age dependency ratio in Myanmar was 16.1 in 2019. It will be doubled by the year 2050 in the medium variant projection. The child dependency ratio over the same period is projected to decline from 43.5 to 33.0. The ageing index of Myanmar has increased from 16.5 years in 1983 to 37.2 years in 2019; therefore, Myanmar's population was older. The ageing index will triple by 2050 (Department of Population, 2017) (see Figure 1.2).

Figure 1.2: Dependency ratios and ageing index: medium variant projection, 2015-2050
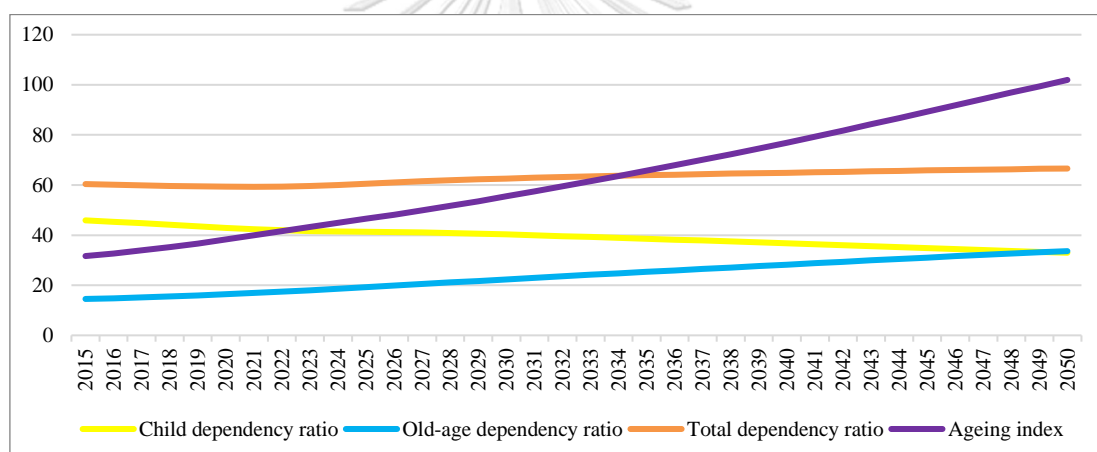
Source: Department of Population, 2017

With the decrease in the number of children and the increase in the number of older people, support ratios will be changed in the future (see Figure 1.3). The potential support ratio is an alternative way of describing the numerical relationship between those more likely to be economically productive and those more likely to be dependent. It is the inverse of the old-age dependency ratio (United Nations, 2007). Between 2019 and 2050, this ratio is projected to decline from 6 to 3 potential workers per person aged 60 years and over. At that time, the parent support ratio indicates the level of support that families may be able to provide to their oldest members (United Nations, 2007). This ratio will increase from 3.1 in 2019 to 9.8 in

2050, indicating that persons well past middle age are three times more likely than they were in 2019 to be responsible for the care of older relatives.

Figure 1.3: Support ratios: medium variant projection, 2015-2050
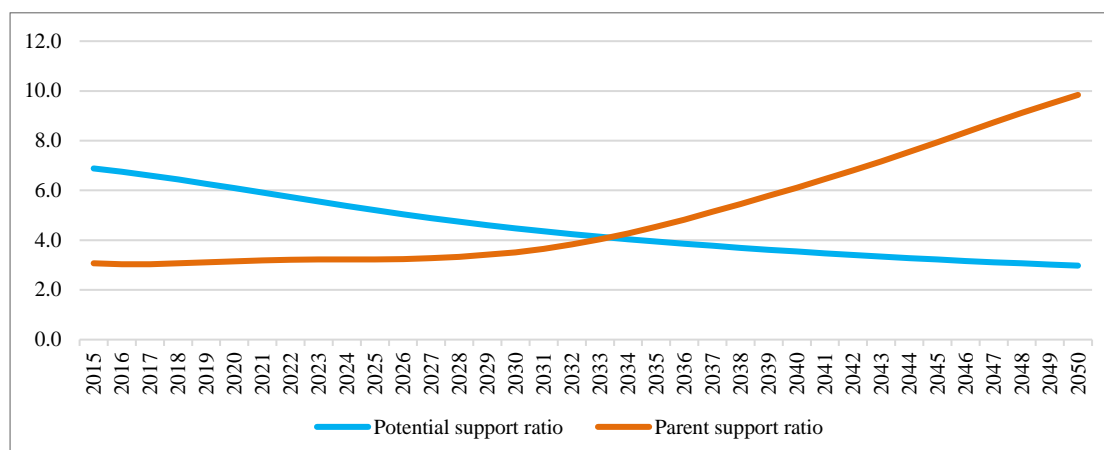
Source: Department of Population, 2017

According to the facts and figures, Myanmar has become an ageing society. This society has also been stimulated to focus on older persons' health, functional ability, social and economic activities, and quality of life. Therefore, the privations of older persons and ageing matters should also be mainstreamed into the population policy. Older people must be able to have an opportunity to benefit from the country's socio-economic development and share the advantages in line with the targets of the Sustainable Development Goals (SDGs) and the International Plan of Action on Ageing.

A key theme of the SDGs is "Leave no one behind". It means ensuring everyone achieves all the rights and opportunities within the SDGs. It is important to be inclusive for all, particularly older people who are among the most underprivileged, for social protection, basic services, and infrastructure. While approaching the SDGs in Myanmar, preparing for the ageing population is vital because ageing matters are cutting across the goals such as poverty eradication, good health and well-being, gender equality, decent work and economic growth, reduced inequalities, and sustainable cities and communities. There is also a global programme called The United Nations Decade of Healthy Ageing (2021-2030). It is a global collaboration among governments, non-government organisations,

professionals, academia and the media to improve the lives of older persons, their families and communities in the last ten years of the SDGs (2021-2030). The Decade will discourse on four areas for action: Age-friendly environments, Combatting ageism, Integrated care for older people and Integrated continuum of long-term care.

In addition, there are the Madrid International Plan of Action on Ageing, 2002 and Myanmar's Action Plan on Ageing, 2014, such as the National Policy for the Older Persons and Social Pension and Community Based Health Care Programmes and Older People's Self-Help Groups. This International Plan of Action on Ageing called for changes in attitudes, policies and practices at all levels to fulfil the enormous potential of ageing in the 21st century. Its specific action recommendations prioritise older persons and development, advancing health and well-being into old age, and ensuring enabling and supportive environments.

Moreover, Myanmar's Action Plan on Ageing, 2014 encourages incentives for employers to hire older people, as well as creates incentives to allow them to gain access to low-interest loans for their homes and renovation. It focuses on income security, enhancing access to resources and participation of older people within communities (Williamson, 2015). The first national activity, Social Pension (government-sponsored monthly cash transfer programme) for people aged 90 and over in Myanmar, was introduced in 2017 (Ministry of Social Welfare, Relief and Resettlement, 2017). Recently, the age of eligibility for a social pension is 85 years old (as of 2022). However, there are restrictions to applying for Social Pension. The eligible older persons have to submit the application form with their identity card and household registration list to the relevant organisations. Older persons living in aged homes with no identity card or household registration list may have difficulty applying for it. For these eligible older persons who cannot submit the complete documents, they can apply with some recommendation letters from the local administrators and three older people in their ward or village. There may still be a restriction on access to social pensions for older persons who are living in rural and/or are not well-educated.

In Myanmar, national policies established Community Based Health Care Programmes for older persons. Now, the government prioritises the prevention,

control and care of non-communicable diseases and conditions. In addition, forming Older People's Self-Help Groups with non-governmental organisations and government networks promote older people's participation and inclusion. The programmes include training activities, fundraising for small businesses, agricultural technology and water sanitation (Ministry of Social Welfare, Relief and Resettlement, 2017).

1.2   Statement of the Problem

In the twenty-first century, population ageing has become an important field of research and policy interest as countries are confronting the increasing older population and trying to provide suitable physical and social environments for their needs and preferences. Older persons' needs and preferences vary based on their ability and quality of life levels. One of the Qualities of Life measurements has focused on self-reported happiness, pleasure and fulfilment and has been termed "Subjective Well-Being" (SWB). Life Satisfaction is the main part of studying Subjective Well-Being. According to previous studies, life satisfaction is the commonly accepted indicator of life experience concerning various living conditions of a person (e.g. (Fernández-Ballesteros et al., 2001)). It is affected by several factors: socio-demographic factors (including age, gender, marital status, income and education) and psychosocial factors (including health, functional ability, participation in activities and social relationships).

Those socio-demographic and psychosocial factors influencing the life satisfaction of older persons are associated with social, economic, welfare, and health care systems (Fernández-Ballesteros et al., 2001; Supratman & Priambodo, 2016). Consequently, these profound issues relating to morbidity, disability, access to housing, and economic resources, including social protection schemes, are being challenged within societies (Powell & Cook, 2009). Therefore, it is crucial to study and understand older persons' needs and evaluate what affects their quality of life and well-being. Myanmar is still poor in geriatric services in public health facilities, and the services are at relatively high costs to private health services. Therefore, the burden of health care costs is one of the major obstacles for older persons who are already poor in terms of economic conditions (Jones et al., 2010).

Most of the Myanmar people live in rural areas (about 70 per cent), and they are engaged in agriculture, the basic economic sector of the country; however, economic opportunities are higher in urban areas (Department of Population, 2020). As people aged, their working capacity declined, and their income decreased. Living in an urban area affects many aspects of life, including access to different forms of employment, more education opportunities, and better public infrastructures such as electricity, roads and health care services.

The custom of older people living with their adult children is firmly deep-rooted in Myanmar. It is infrequent for an older person to live in an institution other than for religious purposes. The majority of older people, about three-quarters, live with at least one child with or without other residents. Older people usually rely on their children for financial support (HelpAge International, 2013). However, about half of older persons have ever provided routine care for grandchildren, and 13 per cent of older persons have provided custodial care for grandchildren with absent parents (Knodel, 2014). Custodial grandparenting practices are likely more prevalent in areas with large migration flows, such as states bordering Thailand. Yet, there are significant knowledge gaps regarding custodial grandparenting practices in Myanmar and the extent to which custodial grandparenting affects the well-being of grandparent caregivers. Vulnerabilities for grandparent caregivers may be further worsened by Myanmar's insufficient Social Safety Net for older persons. Despite the government's recent attempts to expand social pension and health benefits for the older population, the scopes remain limited (Knodel, 2014).

There is also a big difference in the gender composition of older persons in Myanmar; meanwhile, there are 146 older females for every 100 older males. However, when compared within each age group, the ratio of women gradually increased; there are 136 women for every 100 men in the 60-69 age group, similarly 157 women for every 100 men in the 70-79 age group, and 186 women for every 100 men among 80 years and over (Department of Population, 2020). Globally, the "Feminisation ageing trend" has become one of the issues in demography due to the stable growth of the number of older women compared to the number of older men.

Above mentioned consequences, the persons' health and functional ability will deteriorate, and as a result, their life satisfaction will also decline while getting older. These declines are expected to be the lowest at the oldest ages with a low level of education and the economically disadvantaged older people. That is why it becomes crucial to consider factors contributing to their life satisfaction perception. Life satisfaction is one of the important dimensions of well-being and is central to concern about successful ageing (Diener, 1984). It is an overall assessment of feelings and attitudes about one's life at a particular point in time, ranging from negative to positive. The level of satisfaction among the aged affects not only their psychological adjustment but also their physical and social well-being. Gender and life satisfaction is also an important field of study on life satisfaction, in particular, among women.

From the context of this study, the fundamental aspects regarding a health condition, loneliness, and socio-economic status occurring in Myanmar older persons could also be observed. This study proposes that older persons' life satisfaction may be predicted by their socio-economic factors, resulting in the possibility that life satisfaction may not be the same across older persons. In addition, there are few previous studies with a small sample, such as the association between happiness and economic status among older adults (Sasaki et al., 2022) and the study of factors affecting the quality of life of older people in Taungu Township, Bago Region (Oo et al., 2015). However, no quantitative study has used nationally representative data on the determinants of life satisfaction amongst older persons in Myanmar. To fill this research gap, this study, therefore, aims to investigate the association between socio-economic factors and the life satisfaction of older persons in Myanmar and approach the issue from the gender perspective.

1.3 Objectives of the Study

1. To determine the demographic and socio-economic characteristics and health conditions of older persons in Myanmar
2. To investigate the determinants of the life satisfaction of older persons in Myanmar
3. To investigate whether there are gender differences in the determinants of the life satisfaction of older persons in Myanmar

1.4 Scope of the Study

This study focuses on the life satisfaction of older persons aged 60 years and over living in urban and rural areas of Myanmar in 2019. It aims to explore the relationship between demographic, socio-economic, and health-related factors and older persons' life satisfaction. This study uses the most recent secondary data from the 2019 Myanmar Inter-censal Survey. It is a cross-sectional dataset and represents the whole population in Myanmar.

1.5 Benefits of the Study

This study tries to fill an existing gap in analysing the older population and their well-being. The study will develop an understanding of the life satisfaction status of Myanmar's ageing population. It will explore the demographic, socio-economic and health-related factors that influence their well-being. This study will provide suggestions and recommendations for policymakers and planners in formulating strategies for further improvements for those required. This study will also provide an evidence-based policy brief for the Government Strategies that are appropriate to improve the lives of Myanmar's older population, where necessary, based on the study's findings.

1.6 Organisation of the Study

This study is organised into five chapters. Chapter I outlines the background of the study, statement of the problem, objectives of the study, scope of the study and benefits of the study. Chapter II focuses on the literature review of theories and relevant research, determinants of life satisfaction of older persons, and hypotheses and conceptual framework based on literature reviews. Chapter III explains the research methodology and presents the data collection process, variables and measurement. Chapter IV presents an analysis of the results of the quantitative method. Finally, Chapter V presents the conclusion based on the findings and the discussion of policy implications and recommendations.

CHAPTER II: LITERATURE REVIEW

This chapter presents the concepts of life satisfaction, including the concepts and measurements, some theories related to life satisfaction, the feminisation of the older population, and a literature review of the determinants of life satisfaction among older people.

2.1   Concepts and Measurements of Life Satisfaction

Subjective Well-Being (SWB) is the field of psychology which recognises the assessments of people's quality of life, comprising of their cognitive judgments and affective reactions (Diener, 1984). The study of SWB literature uses various terms such as 'happiness, hedonic level, life satisfaction and positive effect'. The study of Andrews and Withey (1976) described that SWB has three components: life satisfaction, positive affect, and negative affect. When individuals have life satisfaction, recurring positive affect (e.g., joy, optimism) and rare negative affect (e.g., sadness, anger), they will have high SWB (Diener et al., 1997). Life satisfaction, positive affect and negative affect are separable concepts, and the researchers can study these components independently. In this study of life satisfaction (the cognitive component), it is based on overall judgments of quality of life and expresses not only the more stable component (Eid & Diener, 2004) but also the key indicator of positive SWB (Diener & Diener, 1995).

Many explanations and definitions of life satisfaction can be observed: "Life satisfaction is an operational definition of successful ageing" (Neugarten et al., 1961). "Life satisfaction symbolises an overarching criterion or ultimate outcome of human experience" (Andrews, 1974). "Life satisfaction is the degree to which a person positively evaluates the overall quality of his/her life as-a-whole" (Veenhoven, 1991). "Life satisfaction is a positive evaluation of the conditions of life" (Sumner, 1996). In fact, life satisfaction alternates from negative to positive when someone's feelings and attitudes are changing in life at a particular point in time.

Life satisfaction is believed to have backgrounds in the work domain, family domain, and personality traits. It is one of the indicators of 'visible' quality of life and other mental and physical health indicators. The less the incompatibility between the

individual's desires and achievements, the more one's life satisfaction is (Diener et al., 1999). Life satisfaction is a range of concepts that are assumed to reflect the conditions of "a good life".

Life satisfaction is generally measured in one of two ways. Global measures assess overall life satisfaction and are based on the so-called "top-down theory" of life satisfaction. The theory focuses on a person's ongoing sense of satisfaction as a whole. The domain-specific, "bottom-up theory", which holds that overall satisfaction is a product of satisfaction in specific domains, or areas of life, is based on the assumption that compartmentalizes feelings and assessments of life. Each compartment contributes to overall life satisfaction. As this study emphasizes on the ageing population, life satisfaction among those is an important concept that gives an overall view of the adjustment and their adaptive coping ability. The level of life satisfaction among older persons affects not only their psychological adjustment but also their physical, emotional and social subjective well-being.

In sum, Life Satisfaction is a cognitive element of Subjective Well-Being and is observed as an indicator of the overall well-being of an older person. This measure is in line with one of the two main assessments about Subjective Well-Being, including a "person's cognitive evaluations" and a "person's affective evaluations". The "person's cognitive evaluations" is how people feel and react to their life through cognition, represented by "overall life satisfaction". Furthermore, the "person's affective evaluations" are the emotional differences of each individual, presented by "happiness", "loneliness", and "depression" (Diener et al., 1997).

2.2   Selected Theories Related to the Study

This section will briefly discuss the theories of Life Satisfaction closely related to Subjective Well-Being or based on the variables that an individual finds personally important in their own life.

2.2.1   Bottom-up and Top-down Theories

Bottom-up model: The first selected theory is a bottom-up which is conserved that satisfaction in life domains leads to overall life satisfaction (Campbell, 1976). In other words, overall life satisfaction is the outcome of cumulative

satisfaction in relevant life domains (see Figure 2.1 (a)). The bottom-up theory holds that people experience satisfaction in many domains of life, such as work, education, marital status, family and friends, personal development, and health and fitness. The satisfaction with life in these areas combines to create overall life satisfaction (Headey et al., 1991).

Top-down model: The top-down model represents an alternative perspective on the relationship (see Figure 2.1 (b)). In this model, overall life satisfaction is assumed to influence satisfaction in various life domains (Diener, 1984). Life satisfaction is an influencer of domain-specific satisfaction (Headey et al., 1991). Many studies generally approved a top-down approach, including Erdogan et al. (2012), Iverson and Maguire (2000) and Rode (2004). There is a relationship between occupation and life satisfaction in a community context (Iverson & Maguire, 2000). Moreover, the previous study assumed that well-being influences the evaluation of specific life domains such as housing (Schimmack, 2008).

In general, the controversy between these two theories is ongoing, and for most people, overall life satisfaction and satisfaction in the multiple domains of life are closely related. Therefore, bottom-up and top-down theories should be applied to predict life satisfaction.

Figure 2.1: A theoretical representation of bottom-up and top-down models

(a) A bottom-up model
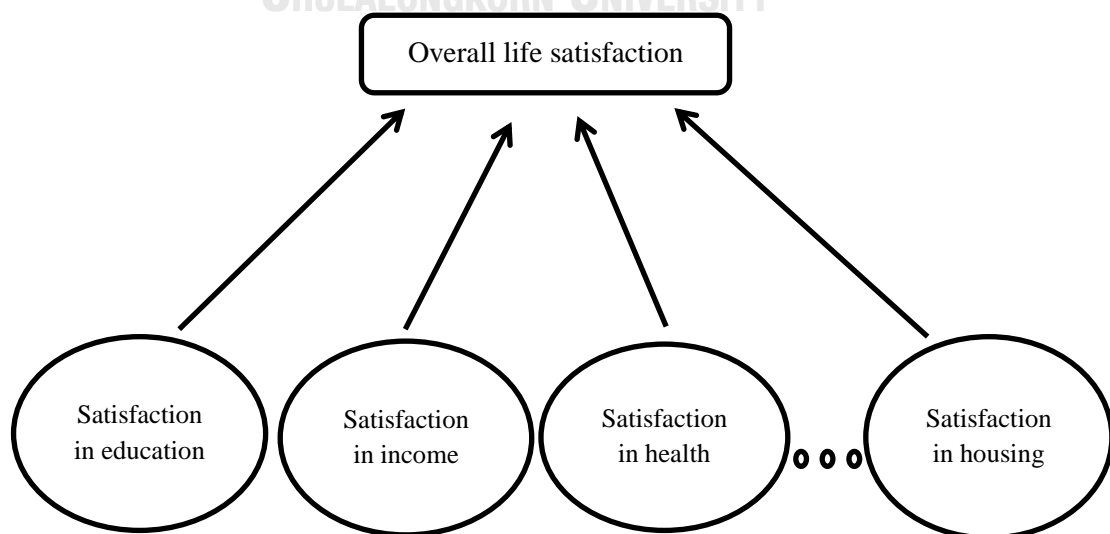
(b) A top-down model
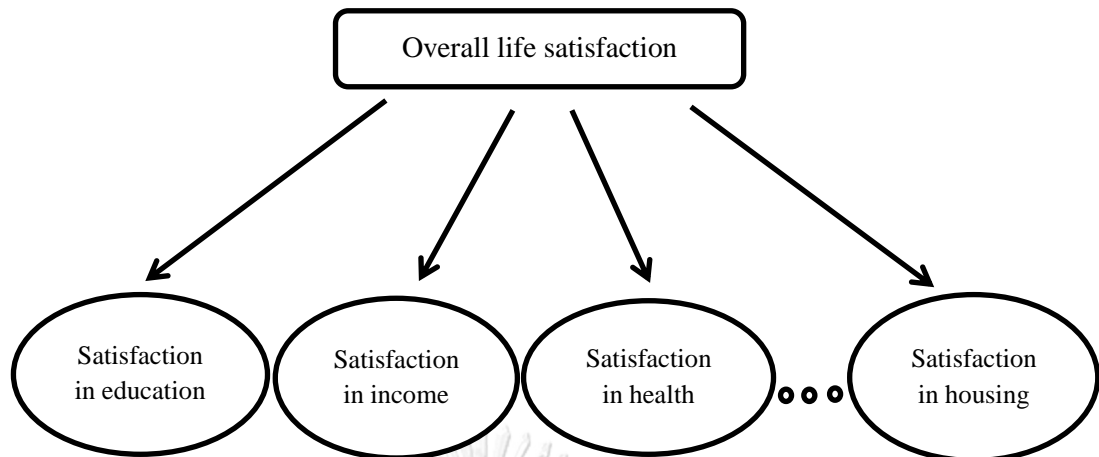
Source: Mallard et al. (1997)

2.2.2   Need-gratification Theory

The other selected theory is Maslow's Need-gratification theory. It can help to examine determinants of life satisfaction because it states that higher need gratification produces more profound happiness than lower need gratification. According to this theory, there are two assumptions. The first assumption is that people living in wealthier nations tend to be more satisfied with their lives and those people tend to base their life satisfaction judgments on the level of gratification of higher needs. The second assumption is that people who are living in poorer nations tend to base their life satisfaction judgments on the level of gratification of more basic needs.

In the field of Psychology, this theory comprises a five-hierarchical model of human needs (physiological, safety/security, belongingness, esteem, and self-actualization) (see Figure 2.2). Once these needs have been reasonably satisfied, people may be able to reach the highest level of satisfaction, called self-actualization. Therefore, life satisfaction cannot be handled in a one-sided dimension (Oishi et al., 1999). Therefore, studying the life satisfaction of older persons should be explored in various aspects, including age, marital status, health conditions, and other socio-economic factors, etc.

Figure 2.1: Maslow's pyramid of need gratification
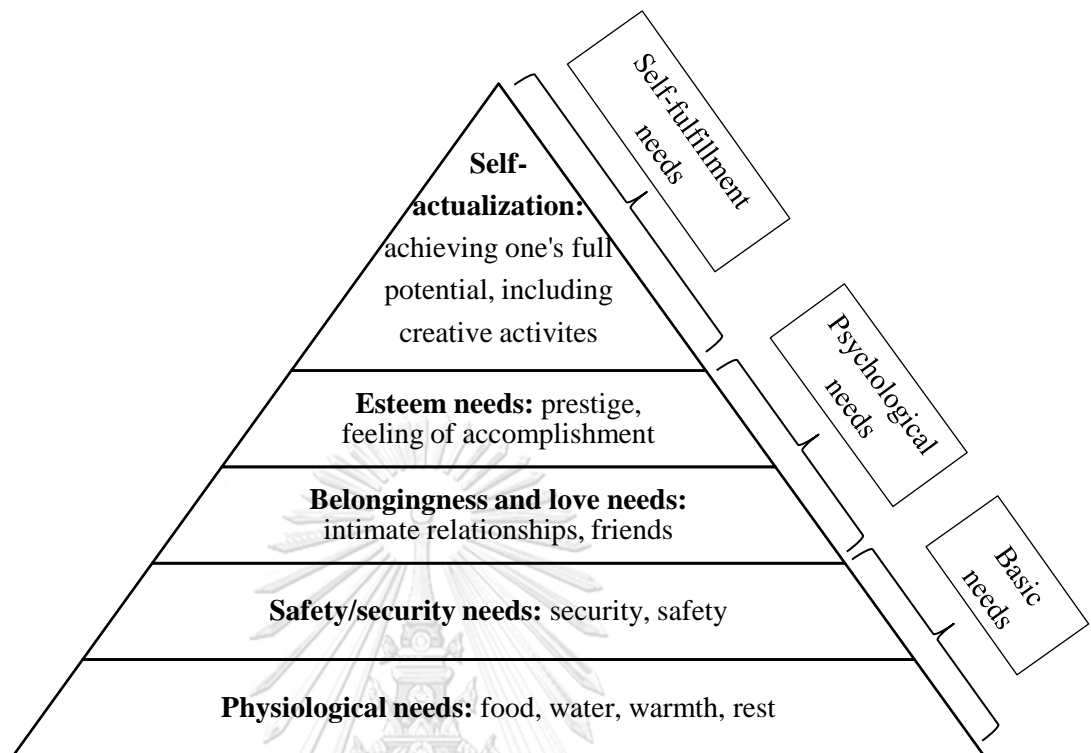
Source: www.theschooloflife.com/article/the-importance-of-maslows-pyramid-of-needs/

2.3   Madrid International Plan of Action on Ageing (MIPAA)

MIPAA, mentioned in Chapter I, composes the most inclusive international policy framework on ageing. It connects ageing to the United Nations social, economic and human rights development frameworks to develop a comprehensive approach. It covers ageing issues from a social welfare approach to a developmental approach. It also focuses on the importance of choosing a positive approach and disabling negative stereotypes in dealing with ageing issues. It supports recommendations for action, divided into three priority directions: (i) Older persons and development; (ii) Advancing health and well-being into old age; and (iii) Ensuring enabling and supportive environments (see Table 2.1).

Table 2.1: MIPAA priority directions and related issues

Priority Directions	Issues
I. Older persons and development	(a) Active participation in society and development (b) Work and the ageing labour force (c) Rural development, migration and urbanization (d) Access to knowledge, education and training (e) Intergenerational solidarity (f) Eradication of poverty (g) Income security, social protection/ social security and poverty prevention (h) Emergency situations
II. Advancing health and well-being into old age	(a) Health promotion and well-being throughout life (b) Universal and equal access to health-care services (c) Older persons and HIV/AIDS (d) Training of care providers and health professionals (e) Mental health needs of older persons (f) Older persons and disabilities
III. Ensuring enabling and supportive environments	(a) Housing and the living environment (b) Care and support for caregivers (c) Neglect, abuse and violence (d) Images of ageing

Source: United Nations (2002)

Another framework related to ageing issues is the Programme of Action of the 1994 International Conference on Population and Development, which emphasizes population issues by placing people, including older persons and their needs, rights and dignity as essential for the achievement of social, economic and sustainable development.

2.4   Determinants of Older Persons' Life Satisfaction

The determinants of life satisfaction for this study may be very different based on the concepts of SWB and life satisfaction, the two selected theories: Bottom-up/Top-down Theory and Need-gratification Theory, and MIPAA. There are various demographic and personality variables in studying life satisfaction, ranging from demographic variables such as income, education, and marital status to personality variables such as self-esteem, optimism, and frequent positive emotional experiences. The standards for life satisfaction may also vary across cultures (Oishi et al., 1999). Abu-Bader et al. (2003) gathered the factors influencing life satisfaction as environmental characteristics such as the availability of social support and personal traits such as self-esteem, physical health, financial resources, a sense of connectedness, and locus of control. This study mainly relies on the Need-gratification Theory and Framework of MIPAA in the conceptual framework. According to Maslow's Need-gratification theory, life satisfaction is driven by the fulfilment of human needs, including basic physiological needs and the need for safety, love and belonging, esteem and personal growth (Oishi et al., 1999). For example, older people in low-income households are less likely to attain need-gratification than those in high-income households due to financial strain, health status, and economic, social, and community resources. This leads to low levels of life satisfaction. MIPAA targets improving older person's quality of life. It will benefit not only older persons but also their families because they will be healthier and better able to continue contributing to the family unit, the community and society.

2.4.1   Demographic Factors

The conceptual framework's demographic factors are age, marital status, place of residence, geographical areas and living arrangement. Age is an important factor associated with life satisfaction. Over the last few decades, the relationship between age and individual well-being has been the subject of concentrated discussion in various research fields, including economics, gerontology, psychology, and sociology. Researchers from different fields have provided a range of theoretical explanations for this relationship and tested them empirically. The findings range from U-shaped and inverted U-shaped relationships to linear or cubic

relationships or no relationship at all. Wunder et al. (2013) reported that well-being follows a wave-like pattern over the life course: life satisfaction declines until midlife, then starts to increase, and eventually seems to decline again among the oldest old. Several studies reported U-shaped age effects, which suggest a nonlinear trend that goes down first and upward later through the life course to reach the bottom around middle age (Blanchflower & Oswald, 2008; Gerdtham & Johannesson, 2001; Yang, 2008). For instance, it was found that life satisfaction reduced as midlife approached but increased after retirement (Gwozdz & Sousa-Poza, 2010). Other studies found a negative relationship between age and life satisfaction. According to (Chen, 2001), the results suggested that life satisfaction decreased after retirement and was lowest among the oldest old group. In some studies, there was no relationship between age and life satisfaction, and it was found stable between ages 45 and 89 (Hamarat et al., 2002; Suh et al., 1998).

The marital status of older people is an important predictor of their life satisfaction. Life satisfaction is significantly higher for married compared to all other marital statuses. Marriage was positively associated with women's life satisfaction but not men's (Botha & Booysen, 2013). In the overall and female samples, married women were more satisfied than those from all other marital statuses. Married men were not significantly more satisfied than men from other marital statuses as a whole. Results suggested that people married or living with a partner tend to rate their well-being higher than single people (Buber & Engelhardt, 2008; Dolan et al., 2008; Gove et al., 1983; Stack & Eshleman, 1998). Waite (1995) researched that marriage provided several advantages and incentives, such as lower mortality risk, sharing in common household goods, and the possibility of combined accumulation of assets and wealth. Stutzer and Frey (2006) discussed that marriage was positively associated with individual well-being since it provided an additional source of self-esteem. Married people were also less likely to be lonely and had the opportunity of gaining from a supportive relationship. Theoretically, this positive empirical relationship between marriage and SWB was attributed to social selection or social causation. Gove et al. (1983) found that social selection suggested that more satisfied individuals were more likely to get married than less satisfied people, as the former may have more attractive personalities. Social causation proposed that marriage made people

more satisfied due to the protective emotional and relational factors usually associated with marriage. In addition, married people were generally healthier and earned substantially higher incomes than people of other marital statuses (Stack & Eshleman, 1998; Waite, 1995).

Place of residence and geographical areas are the most important socio-demographic factors that characterise older persons' life satisfaction. It also influences the living arrangement of the older person. The older people in rural areas were more likely to live alone than their counterparts in urban areas (United Nations, 2006), and the likelihood of co-residing with a child was higher in urban areas than in rural areas (Barbieri, 2006). The migration of the younger generation moving into the city seeking better jobs and education had caused older persons to be left behind in rural areas with positive economic support and contact from their migrated children (Knodel & Saengtienchai, 2007). There was a more positive effect on the well-being of the older population living in the rural areas when it came to visiting with friends, neighbours, or relatives than those in the urban area (Carta, 2012). Place of residence, urban and rural, varies largely in terms of socio-economic status and lifestyles; thus, there are differences in the level of life satisfaction between the two areas. A study on Chinese adults by Zhou (2013) found that people residing in rural areas were more likely to be happy than their urban counterparts. On the other hand, a study among Thais by Rukumnuaykit (2015) showed no significant association between place of residence and level of life satisfaction.

The living arrangement of older people is also an important factor in their life satisfaction. Due to the demographic transition, the number of older persons has been increasing, while at the same time, there is substantial migration of the younger generation from home. This migration flow has affected the living arrangement patterns of older persons (Pinquart & Sorensen, 2001). People who live with their families can get health care and social support. Many studies of the living arrangement of older people have been conducted in Western countries where population ageing took place many years ago.

In contrast to the situation in developed countries, where the trend of living alone or living with a spouse only was expected, the majority of older Asian

people continued to live with their offspring (Barbieri, 2006). Many older persons in Myanmar are also living with their adult children. According to the study of HelpAge International (2013), the majority of Myanmar older persons, about 75 per cent, live with at least one child with or without other family members. Since Myanmar's society respects the value of older people, older people get help from their adult children in daily activities and care when sick, especially daughters (Knodel, 2013). The number of older persons who live alone is increasing in developed and developing countries because of a soundly rise in life expectancy and a gender gap in longevity (United Nations, 2013). The older persons living with a spouse only or alone could not fully obtain family support, such as physical or emotional care and had lower life satisfaction (Chen et al., 2021).

2.4.2   Socio-economic Factors

Socio-economic factors such as education level, employment status, receiving pension, allowance or benefits, participation in community activities, household income quintile, housing type and house ownership are linked to older persons' life satisfaction. While some socio-economic indicators (e.g., education level, employment status) reflected socio-economic experiences in earlier life stages, other indicators (e.g., household income, receiving allowance) represented current socio-economic conditions that are more susceptible to change with age (Braveman et al., 2005). This finding was followed by the study of Pinquart and Sörensen (2000).

Higher levels of education also tend to be positively associated with life satisfaction. Education level may have affected the respondents' attitudes toward traditional family norms and their participation in social activities. In addition, older persons' functional limitations and dependency are lower when older people have higher levels of education. Davis and Friedrich (2004) found that older people with a higher level of education rated their well-being higher. This may be because the knowledge that older people had gained from their education had prepared them better to adapt to the physical, psychological, and social changes of ageing. Education affects various areas of satisfaction. For example, employees' education level was found to be related to their job satisfaction when the characteristics of the employees were controlled (Vila & Garcia-Mora, 2005).

Regarding the source of income, there is a positive association with well-being among older persons (Larson, 1978). Among employment status, employers and own account workers were likely to be satisfied because they had a higher level of independence, which can lead to higher satisfaction levels in one's work. Meanwhile, employees had little decision-making power and tight control over them by the salary and working hours, which could negatively affect their satisfaction at work (Benz & Frey, 2004). Household income is also significantly associated with life satisfaction. The fact that income only related to the evaluative component of life satisfaction was consistent with the findings by Kahneman and Deaton (2010). In addition, measures of retiree well-being have primarily focused on two economic measures of well-being. The most common metric was retirement income, as summarized in Andrews (1993) and Radner (1998). The other common metric examined wealth, generally financial assets, net housing value, and the present discounted value of Social Security retirement and pension benefits (Levine et al., 2000).

World Health Organization (2001) stated that community participation was defined as involvement in life situations such as work, school, play, sports, entertainment, learning, civic life and religious practice, among others. Developmental theories suggest that participation patterns change across the lifespan. The higher the age, the less diversity of social participation was evident (Desrosiers et al., 2004), resulting in less leisure and productive activities, but not daily activities (Sachs & Josman, 2003). Social participation remains low among older persons in Myanmar. Only 38 per cent of Myanmar older persons had participated in at least one type of community activity such as recreation and sports, meeting with friends, political meetings and gatherings, art or cultural activities, educational, religious or humanitarian activities, in the past 12 months of the 2019 MICS (Department of Population, 2020).

Social participation was a resource of social networks (e.g., family members, friends, acquaintances, caregivers and significant others) that enhanced one's ability to cope with daily life events (Bishop et al., 2006). Not only was social support related to well-being (Bishop et al., 2006; Diener et al., 1999; Law, 2002;

Levasseur et al., 2004) and meaning in later life (Krause, 2007), but it was also linked to participation (Fougeyrollas et al., 1998). Continuous working and participation in volunteering activities or community events were also related to a higher level of Subjective Well-Being (Pinquart & Sorensen, 2001). Various studies indicate social participation as a factor which strongly influences life satisfaction among the older population. Furthermore, factors like household environment (both physical and social), overall well-being, demographic characteristics, self-acceptance (social support), personal traits (cognitive health) and lifestyle indicators (smoking, consuming tobacco and alcohol) were correlated with life satisfaction among the older population (Boonphadung, 2013).

The last variables of socio-economic factors of this study are housing type and house ownership. Coates et al. (2015) observed that older persons could receive opportunities from the type of housing and its environment to enable them to have a good life. Better housing was not just a source of shelter but also can facilitate access to employment and recreational facilities to live healthy and safe lifestyles. The study also found that house ownership was a key factor in determining housing satisfaction. It can give a greater sense of control over owned housing. It can represent expectations fulfilled for life satisfaction.

2.4.3 Health-related Factors

Health-related factors are another important determinant in the life satisfaction of older persons. This study's health-related factors concern functional difficulty and health status. The ageing process and the consequent disability affect the individual, family and society in many aspects and caused high social and economic burdens in the world (Alemayehu & Warner, 2004; Comijs et al., 2005). Chronic conditions in most older people may cause difficulty when combined with age-dependent functional changes, i.e., difficulty increases with advancing age (Bowling et al., 2002; Yoon et al., 2004). The concept of life satisfaction was an important process for older people, whose life expectancy had been increased, and life satisfaction had become one of the most significant objectives in the healthcare field (Karatas, 1988; Neugarten et al., 1961). Older individuals with functional difficulty were thought worthless, worn out or exhausted, becoming a significant obstacle in

achieving proper life satisfaction (Hardy et al., 2005; Murphy, 2003). Older persons with more disabilities have lower well-being once they receive assistance from others and/or devices.

Health condition and the individual perception of his/her health status were one of the most significant determinants of life satisfaction (Akandere, 2007). According to the studies of Kumar and Kumar (2012) and Schnittker (2005), self-rated health was a subjective evaluation. It had been considered the most widely used and valuable health status measurement in epidemiological and geriatric research. In addition, previous studies also revealed that self-rated health is strongly and significantly associated with morbidity, well-being and the quality of life of older persons (Hoang et al., 2007; Mwanyangala et al., 2010). Suppose the individual has experienced adverse life events such as functional difficulty and poor health status. In that case, these may increase psychological distress and, in turn, can lower life satisfaction.

In sum, life satisfaction has been considered the subjective expression of the quality of life or Subjective Well-Being. The major life events experienced in the ageing process are expected to impact the ageing population's life satisfaction profoundly. For example, life satisfaction may sharply decrease when people get older as they are affected by major life events such as retirement and physical health deterioration. Therefore, examining differences in the ageing population's life satisfaction becomes critical for social welfare programmes. In order to design good welfare programmes, policies, and regulations for the ageing population, an understanding of the relationships between people's characteristics and their perceptions of life satisfaction is needed.

2.5   Gender Composition Differences and Feminization of Older Population

As mentioned in Chapter I, the "Feminisation ageing trend" is a global phenomenon. This trend has been observed in the study of gender composition differences. World population ageing report (2015) projected that the number of people aged 60 years and over in the world will increase by 56 per cent between 2015 and 2030 (from 901 million to 1.4 billion) and more than double between 2015 and 2050 (United Nations, 2015). The number of older people in Asia is expected to increase by 66 per cent, second among all continents. In addition, females usually live longer than males for an average of 4.5 years. According to WHO's first policy framework about active ageing, the feminisation of the older population was the fourth global ageing challenge in the group of seven challenges of the ageing population when female life expectancy exceeded male life expectancy, and this trend was stronger over time (World Health Organisation, 2002).

In studying life satisfaction, gender composition difference is also an important field. Previous studies found that overall life satisfaction decreases with an increase in age, whereas overall life satisfaction increases with an increase in personal income. Moreover, the overall life satisfaction of women rises with an increase in family income (Jan & Masood, 2008).

Older men and women are facing different challenges in the changing scenario. The previous studies of Gold et al. (2002) and Murtagh and Hubert (2004) found gender differences in life satisfaction. Women experienced more health-related problems than men. They were more exposed to functional disability, reported lower internal control, reported loneliness more often (Pinquart & Sorensen, 2001), were more likely to become widowed, and, especially in older cohorts, were exposed to unequal opportunities.

Gender is the specific demographic characteristic factor in the social and physical activities of Myanmar people. The 2019 MICS stated that women could live longer than men (an average of 6.8 years), and women had lower mortality rates in all ages. About 38 per cent of older people had participated in at least one type of community activity, and there is a large gender gap between males (47 per cent) and females (33 per cent) (Department of Population, 2020).

Previous research yielded mixed results on the relationship between gender and life satisfaction. Whereas some studies had found that women were more satisfied with their lives than men (Jovanović & Lazić, 2019; Stone et al., 2010; Tay et al., 2014), others had found that men were more satisfied (Goldbeck et al., 2007; Helliwell & Putnam, 2004). Still, other studies showed negligible gender differences in life satisfaction (Glaesmer et al., 2011). It is noteworthy that most studies showing significant differences between men and women in life satisfaction have yielded small effect sizes (Geerling & Diener, 2020).

Some moderators may also influence the relationship between gender and life satisfaction. Indeed, several studies showed that the relationship between gender and life satisfaction depends on national contexts, socio-cultural conditions, and demographic variables (Meisenberg & Woodley, 2015). Graham and Chattopadhyay (2013) stated that gender differences in life satisfaction depend on age, income, education, marital status, and national levels of development. Moreover, in the study of Sener et al. (2008), older people appear different. Besides, life satisfaction among older females tends to depend on educational background, marital status, and the connected frequency of friends, family members, and relatives. On the other hand, the life satisfaction of older males is influenced by the factor of health and the connected frequency of friends, family members, and relatives.

2.6   Hypothesis and Research Questions

2.6.1   Hypothesis

According to the review of the literature, it can be hypothesized that:

Hypothesis 1: Men are likely to have higher level of life satisfaction than women.

Hypothesis 2: Place of residence is associated with life satisfaction.

Hypothesis 3: Geographical area is associated with life satisfaction.

Hypothesis 4: Living arrangement is associated with life satisfaction.

Hypothesis 5: Education is positively associated with life satisfaction.

Hypothesis 6: Participation in community activities is associated with life satisfaction.

Hypothesis 7: Income is positively associated with life satisfaction.

Hypothesis 8: Health status is associated with life satisfaction.

2.6.2 Research Questions for Quantitative Research

In this study, there are three research questions for quantitative research. They are:

1. What are the demographic characteristics, socio-economic characteristics and health conditions of older persons in Myanmar?
2. What are the determinants of the life satisfaction of older persons in Myanmar?
3. Are there gender differences in the determinants of the life satisfaction of older persons in Myanmar?

2.7 Conceptual Framework

Evidences from the literature reviews reveal that the life satisfaction of older persons depends on demographic characteristics, socio-economic characteristics and health-related characteristics. Therefore, based on the identified variables from the literature review and the availability of variables in the dataset, the conceptual framework is constructed as follows:

Demographic characteristics

- Age
- Sex (H1)
- Marital Status
- Place of residence (H2)
- Geographical areas (H3)
- Living arrangement (H4)

Socio-economic characteristics

- Education level (H5)
- Employment status
- Receiving pension, allowance or benefits
- Participation in community activities (H6)
- Household income quintile (H7)
- Housing type
- House ownership

Health-related characteristics

- Functional difficulty
- Health status (H8)

Life satisfaction of older persons

CHAPTER III: RESEARCH METHODOLOGY

This section presents the methodology used to perform this study. It highlights the source of data, coverage and sampling techniques used to analyse the data. It also describes dependent and independent variables and their associations.

3.1   Source of Data

This study uses secondary data from the 2019 Myanmar Inter-censal Survey conducted by the Department of Population, Ministry of Immigration and Population. This survey was a large cross-sectional and nationally representative survey. The primary objectives of the 2019 MICS were to produce updated population and socio-economic data for policy implications, to determine population growth and changes, and to provide the inputs for monitoring the implementation of current policies, programmes and plans. The survey collected individual information on demographic characteristics, socio-economic characteristics, functional difficulty, participation in community activities, well-being and support received by the older population, housing and household amenities, and Water, Sanitation and Hygiene. The main source of information for this study is based on the older population information from the questionnaire, where the data is collected from older persons aged 60 and over (dop.gov.mm/ en/2019-myanmar-intercensal-survey-questionnaire).

3.2   Sampling Design and Coverage

The sample for the 2019 MICS was to provide reliable estimates of key indicators representing the district level of Myanmar at the mid-point between the decennial censuses. A stratified two-stage sample design was used for selecting the sample for this survey. Firstly, the primary sampling units (PSUs) were selected from enumeration areas (EAs) based on the nationwide Myanmar Population and Housing Census in 2014. These EAs were stratified by urban and rural areas within each district. Then, the specified number of sample EAs was allotted to the urban and rural strata proportionally to the number of households in the 2014 Census Frame. Within each stratum, the sample EAs were selected systematically with probability proportional to size (PPS) based on the number of private households in each EA from the 2014 Census Frame. From each of these sample EAs, 35 households were

selected to be interviewed for the survey. A response rate of 95 per cent among sampled households was achieved (Department of Population, 2020).

3.3   Study Sample

To investigate life satisfaction among Myanmar older persons, the sample of this study was 65,065 older persons who responded self-rated question, "Are you basically satisfied with your life?" This study excluded the older persons who refused to answer, could not answer by themselves or responded as did not know at the time of the survey. This 2019 MICS applied the de-jure method; hence, it covered older persons living in conventional households. It asked every older person who is living in the selected sample households. This survey's questions covered a wide range of topics, including older persons' age, sex, marital status, education level, employment or working status, place of residence or geographical location, functional difficulty, receiving pension, allowance or benefits, community participation, support received, self-rated general health status and life satisfaction.

3.4   Operational Definition for Quantitative Research

The study explores the socio-economic determinants of life satisfaction (dependent variable) among older persons. The independent variables include demographic, socio-economic and health-related characteristics of older persons.

3.4.1   Dependent Variable

The dependent variable, the life satisfaction of older persons, assesses his/her life satisfaction on a scale from 1 to 5. The question is, "Are you satisfied with your life? Table 3.1 shows the dependent variable's distribution. The higher satisfaction frequencies are the responses in "All of the time, Most of the time, and Some of the time". This frequency changes according to the satisfaction degree.

Table 3.1: Life satisfaction of older persons, 2019 Inter-censal Survey

Life satisfaction	Number	Per cent
None of the time	486	0.75
A little of the time	4,376	6.73
Some of the time	13,583	20.88
Most of the time	31,949	49.10
All of the time	14,671	22.55
Total	**65,065**	**100**

This dependent variable is an ordinal variable with a 5-point scale. Therefore, the parallel assumption test is checked for the ordered logistic regression. After testing the parallel assumption, the ordered logistic regression is unsuitable for the dependent variable. That is why this study uses multinomial logistic regression to assess the life satisfaction of older persons. Multinomial logistic regression is used when the dependent variable is categorical (or nominal): the dependent variable's categories are more than two. This regression can be thought of as simultaneously estimating binary logits for all comparisons among the dependent categories. To produce more meaningful results, 'None of the time' combines with 'A little of the time' to form 'Unsatisfied' in this study. It creates a nominal variable with four categories: 1= Unsatisfied, 2= Neutral, 3= Fairly satisfied and 4= Very satisfied.

In addition, binary logistic regression is used to measure the life satisfaction of older persons from a gender perspective. Binary outcomes, 'Satisfactory' versus 'Not satisfactory', are also created. In general, Myanmar people are culturally hesitant to respond to the negative answer, and the proportions of the extreme responses in this study were very small. Therefore, the 5-point life satisfaction was converted to binary outcomes, even though it can result in a loss of information regarding the original rating distributions. In this model, the life satisfaction outcomes group 'All of the time or Most of the time' represents "successful ageing" and is defined as 'Satisfactory'. Then, other outcomes group 'Some of the time, A little of the time or None of the time' is called 'Not satisfactory'.

Besides, other studies with the Asian's older population also dichotomized the same way this study did (Li et al., 2015; Oshio, 2012).

3.4.2   Independent Variables

Independent variables were identified based on the literature reviews on the determinants of life satisfaction among older persons. To consider the determinants of older person's life satisfaction: the three sets of covariates were included in this analysis.

The first group is demographic characteristics which include:

Age refers to the years a person has lived at their last birthday in reference to the conducting date and time of the survey. For this study, it is classified into three age groups: Young-old (from aged 60 to 69), Middle-old (from aged 70 to 79) and Oldest-old (aged 80 and over).

Sex refers to the status of older persons as male and female.

Marital status is measured by the current marital status at the time of the survey.

Place of residence is where the older people lived at the time of the survey, urban and rural areas classified by the General Administration Department.

Geographical areas are the areas where the respondent lived during the survey. For this study, it is classified into four areas of States/Regions which is based on geography: Mountainous area (Kachin State, Kayah State, Kayin State, Chin State and Shan State), Coastal area (Tanintharyi Region, Mon State, Rakhine State and Ayeyawady Region), Middle area (Sagaing Region, Magway Region, Mandalay Region and Nay Pyi Taw) and Lower area (Bago Region and Yangon Region).

Living arrangement means the living pattern of older persons at the time of the survey.

The second group is socio-economic characteristics which include:

Education level means the highest grade completed of older persons in the education system. It covered both public and private institutions accredited by the government.

Employment status refers to the older persons' working status, whether unemployed or employed (employee, employer, own account worker, helping in the family business, others, etc.) at the time of the survey. It is based on the usual activity status in the last seven days prior to the survey.

Receiving pension, allowance or benefits means the older persons received any pension, allowance or benefits (cash or kind) from government, non-government and community societies at the time of the survey.

Participation in community activities means any community activity in which the older persons involved in the past 12 months of the survey.

Household income quintile is computed based on the total equivalised income attributed to each household member. The data (of each person) are ordered according to the value of the total equivalised income. Equivalent income is a measure of household income (average annual income from all sources) that takes account of the differences in a household's size and composition and thus is equivalised or made equivalent for all household sizes and compositions. It can be measured by the square root scale: Total household income is divided by household size exponentiated by "N," where N is a number between 0 and 1. It can be noted that if N = 0, the denominator equals 1. In that case, no adjustment is made for household size. If N = 1, the denominator equals household size, which is the same as converting household income into per capita income. The usual approach is to let N be some number between 0 and 1. Following other researchers, this study uses N = 0.5 (Johnson et al., 2005). In practical terms, this means that household income is divided by the square root of household size, for example, 1.41 for a two-person household, 1.73 for a three-person household, 2.00 for a four-person household, and so on.

An equivalence-scale adjustment by square root scale is defined as follows:

$$Adjusted\ household\ income = \frac{Total\ household\ income}{Household\ size^N}$$

Housing type means the housing units the older persons live in at the time of the survey.

House ownership means the tenure status of the household where the older persons live at the time of the survey.

The third group is health-related characteristics which include:

Functional difficulty means a person facing greater limitations in performing daily activities or contributing in roles (such as work) if no assistances are accessible than the general persons. This study considers the six types of functional difficulty according to Washington Group Short Set on Functioning (WG SS-F) questions: Seeing, Hearing, Walking, Remembering, Self-care and Communication (Principles and Recommendations for Population and Housing Censuses, Revision 3) (United Nations, 2017c).

Health status means the general health status of the older persons, which was self-rated with a 5-point scale: Very poor as 1, Poor as 2, Fair as 3, Good as 4 and Very good as 5.
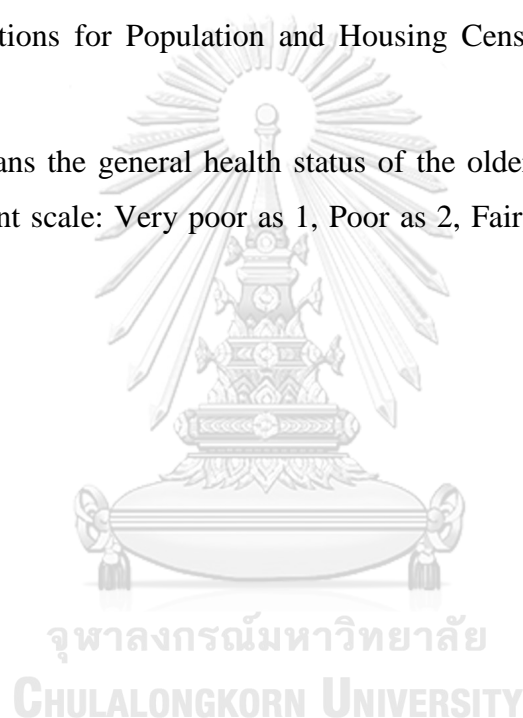
Table 3.2: Summary of variables' description, scale and level of measurement

No.	Variables	Descriptions	Scale and level of measurement
Dependent variable			
1	Life satisfaction for multinomial variable	Satisfaction status measures in term of the respondent's answering with four categories:	**Nominal** 1= Unsatisfied 2= Neutral 3= Fairly satisfied 4= Very satisfied
2	Life satisfaction for binary variable	Satisfaction status measures in term of the respondent's answering with binary outcomes:	**Nominal** 0= Not satisfactory 1= Satisfactory
Independent variables			
1	Age	The completed age of respondent at the time of survey	**Interval** 1= Young-old 2= Middle-old 3= Oldest-old
2	Sex	Sex of the respondent is either male or female	**Nominal** 1= Male 2= Female
3	Marital status	The current marital status of older persons at the time of survey	**Nominal** 1= Single 2= Married 3= Widowed 4= Divorced/Separated
4	Place of residence	The place of the residence where the respondent currently lives	**Nominal** 1= Urban 2= Rural

No.	Variables	Descriptions	Scale and level of measurement
5	Geographical areas	The geographical areas where the respondent currently lives	**Nominal** 1= Mountainous 2= Coastal 3= Middle 4= Lower
6	Living arrangement	The older person is living in the household with/without other household members at the time of survey	**Nominal** 1= Living alone 2= Living with spouse (maybe anyone else but no children and grand-children) 3= Living with at least one child (maybe anyone else) 4= Living with grand-children only (no child-ren) 5 = Others (maybe living with siblings, other relatives, non-relatives and grandchildren but no children)
7	Education level	The highest grade completed of the older persons in the education system	**Ordinal** 1= None 2= Primary 3= Secondary 4= Higher 5= Others

No.	Variables	Descriptions	Scale and level of measurement
8	Employment status	Employment status measures in terms of the older persons' usual activity status in the last 7 days prior to the survey	**Nominal** 1= Not working 2= Employee 3= Employer 4= Own account worker 5= Helping in family business (without pay) 6= Others
9	Receiving pension, allowance or benefits	The older persons received any kind of allowance in the survey period	**Nominal** 0= No 1= Yes
10	Participation in community activities	The older persons involved any type of community activity in the past 12 months of the survey	**Nominal** 0= No 1= Yes
11	Household income quintile	Household income quintile measures based on the total equivalised income attributed to each member of the household	**Ordinal** 1= Lowest 2= Low 3= Middle 4= High 5= Highest
12	Housing type	The type of housing units which the older persons are currently living	**Nominal** 1= Wooden or brick house 2= Apartment 3= Bamboo or temporary house
13	House ownership	The tenure status of the household at the time of survey	**Nominal** 0= No 1= Yes

No.	Variables	Descriptions	Scale and level of measurement
14	Functional difficulty	A situation where a person greater facing limitation in performing daily activities or contributing in roles (such as work)	**Nominal** 0= No difficulties 1= Difficulties in any type of the six activities
15	Health status	The older persons rated their health status with a 5-point scale	**Ordinal** 1= Very poor 2= Poor 3= Fair 4= Good 5= Very good

Note: For nominal variables, dummy variables were created.

3.5   Data Analysis for Quantitative Research

The STATA software is applied to analyse data. Quantitative analysis is conducted to meet the objectives of this study. Univariate analysis, such as frequency distribution and percentage, and bivariate analysis, such as cross-tabulation with Chi-square test, are also included. The multivariate regression is used to determine associations between socio-economic factors and life satisfaction, controlling for other demographic and health-related factors.

For self-reported life satisfaction, which is a nominal variable with four categories, the proposed 'Multinomial Logistic Regression' model is as follows:

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_j x_j) = G(x\beta)$$

In this model, P is probability of a 'success' given explanatory variables. A cumulative distribution function is $0 < G(z) < 1$, in which $G(z)$ is strictly between zero and unity for all real numbers 'z'. The response probability is thus a function of the explanatory variables x. Shorthand vector notation $(x\beta)$ is the vector of explanatory variables and x also contains the constant of the model.

In order to successfully apply logit models,

Logit: $G(z) = \Lambda(z) = \exp(z) / [1 + \exp(z)]$

For continuous explanatory variables (e.g., age):

$$\frac{\partial P\ (y=1|x)}{\partial x_j} = g(x\beta)\beta_j \qquad \text{where } g(z) = \frac{\partial G(z)}{\partial z} > 0$$

$\frac{\partial P\ (y=1|x)}{\partial x_j}$ shows how to change the probability for y=1 if explanatory variable x_j changes by one unit.

For discrete explanatory variables (e.g., sex and education level):

$$G[\beta_0 + \beta_1 x_1 + \cdots + \beta_j(c_j + 1)] - G[\beta_0 + \beta_1 x_1 + \cdots + \beta_j c_j]$$

$\beta_j(c_j + 1)$ and $\beta_j c_j$ show how to increase the explanatory variable x_j by one unit.

It is assumed that partial effects '∂' are non-linear and depend on the level of 'x'.

Where,

P is the probability that a case in a particular category;

β_0 is a coefficient of the constant;

β_j is the coefficient of independent variables and

x_j is the independent variables including demographic, socio-economic and health-related factors.

For studying the life satisfaction of older persons from a gender perspective, 'Binary Logistic Regression' model can be used as follow:

$$P(y = 1|x) = \beta_0 + \beta_1 x_1 + \cdots + \beta_j x_j$$

In this model, it is given below based on the dichotomous dependent variable: satisfactory or not satisfactory which is estimated 1 if the estimation of latent variable is above the threshold, 0 otherwise.

$$\beta_j = \frac{\partial P\ (y=1|x)}{\partial x_j}$$

$\frac{\partial P\ (y=1|x)}{\partial x_j}$ shows the coefficients described the effect of the explanatory variables on the probability that y = 1.

Where,

y is dependent variable representing life satisfaction, wherein satisfactory equals 1, 0 otherwise;

β_0 is a coefficient of the constant;

β_j is the coefficient of independent variables and

x_j is the independent variables including demographic, socio-economic and health-related factors.

3.6   Data Limitation

The study employed the secondary data set from the 2019 MICS, which meant some potential determinants could not be included in the analysis, such as some health-related variables, such as chronic disease, mental health issues, anxiety, depression, etc. And also, this data does not contain information regarding religion and ethnicity, as they are sensitive data in Myanmar. Therefore, the life satisfaction and socio-economic factors for older persons by religion and ethnicity could not be analysed.

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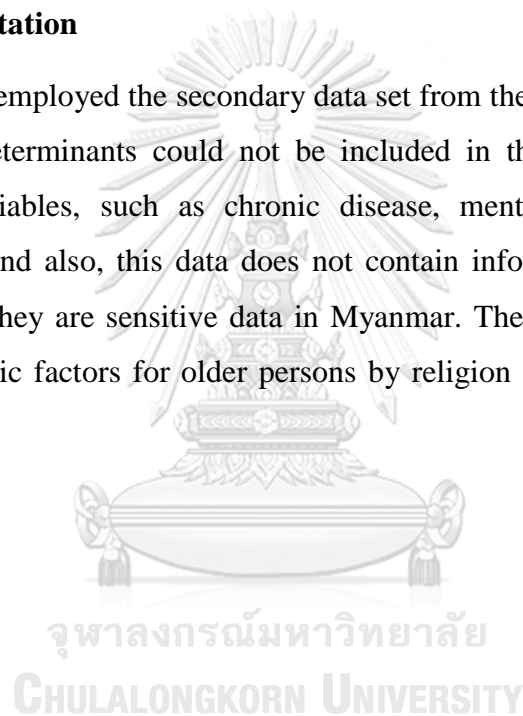
CHAPTER IV: RESULTS

This chapter describes the association between demographic, socio-economic and health-related factors and life satisfaction among older persons in Myanmar.[1] Descriptive analysis was used to present the background characteristics of older persons, namely, demographic characteristics, socio-economic characteristics and health-related characteristics in relation to life satisfaction. Differentials in older persons' life satisfaction were subsequently explored using bivariate (Chi-square test) and multivariate analysis (Multinomial Logistic Regression and Binary Logistic Regression). Multivariate analysis was used to determine the relationship between socio-economic, other independent variables and older persons' life satisfaction in Myanmar.

4.1   Descriptive Statistics

In this study, there are 65,065 older persons. Among them, 27,139 (41.71 per cent) are 'Males', and 37,926 (58.29 per cent) are 'Females'. In Table 4.1, it can be seen that most of the older persons belong to 'Fairly satisfied' at 49.10 per cent, while fewer older persons fall in 'Unsatisfied' at 7.47 per cent. According to this table, Myanmar older persons are mostly satisfied with their life because life satisfaction questions are usually based on their perception. Therefore, studying the relationship between life satisfaction and background characteristics is important.

Table 4.1: Descriptive statistics for the dependent variable

Life satisfaction of older persons	All	Males	Females
Unsatisfied	7.47	6.89	7.89
Neutral	20.88	19.86	21.61
Fairly satisfied	49.10	49.79	48.61
Very satisfied	22.55	23.46	21.89
Total	**100**	**100**	**100**
Number	**65,065**	**27,139**	**37,926**

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[1] The initial results have been presented in the 13th International Graduate Students Conference on Population and Public Health Sciences (IGSCPP) organized by Chulalongkorn University and Mahidol University which has the proceedings (Determinants of Life Satisfaction among Older Persons in Myanmar).

From a gender perspective, the proportion of males is higher than the proportion of females in both 'Fairly satisfied' and 'Very satisfied' categories. Therefore, female life satisfaction is lower than male life satisfaction even though the share of the older female population is greater than that of the older male population.

Table 4.2: Descriptive statistics for independent variables

Variables	All	Males	Females
Demographic factors			
Age			
Young-old	61.10	63.36	59.48
Middle-old	27.57	26.67	28.21
Oldest-old	11.33	9.97	12.31
Marital status			
Never married	7.04	3.94	9.26
Married	58.68	78.04	44.82
Widowed	32.96	16.94	44.43
Divorced/Separated	1.32	1.08	1.49
Place of residence			
Urban	29.87	28.61	30.77
Rural	70.13	71.39	69.23
Geographical areas			
Mountainous	20.03	20.68	19.57
Coastal	21.13	21.88	20.59
Middle	39.36	38.34	40.10
Lower	19.48	19.11	19.74
Living arrangement			
Living alone	5.49	3.78	6.71
Living with spouse (maybe anyone else but no children and grandchildren)	10.44	13.63	8.15
Living with at least one child (maybe anyone else)	71.30	72.90	70.17
Living with grandchildren only (no children)	4.05	3.81	4.23
Others	8.72	5.88	10.74
Socio-economic factors			
Education level			
None	30.70	23.64	35.76
Primary	40.42	37.48	42.52
Secondary	12.27	16.84	9.01
Higher	11.13	14.60	8.64
Others	5.48	7.44	4.07

Variables	All	Males	Females
Employment status			
Not working	64.30	49.50	74.89
Employee	4.28	6.84	2.44
Employer	3.15	4.95	1.86
Own account worker	22.67	33.42	14.99
Helping in family business (without pay)	4.96	4.29	5.43
Others	0.64	1.00	0.39
Receiving pension, allowance or benefits			
No	85.98	84.39	87.12
Yes	14.02	15.61	12.88
Participation in community activities			
No	61.50	53.58	67.17
Yes	38.50	46.42	32.83
Household income quintile			
Lowest	22.05	21.84	22.21
Low	19.67	19.88	19.52
Middle	19.76	19.66	19.83
High	18.52	18.32	18.67
Highest	20.00	20.30	19.77
Housing type			
Wooden or brick house	71.38	72.10	70.86
Apartment	4.65	4.48	4.76
Bamboo or temporary house	23.97	23.42	24.37
House ownership			
No	4.01	3.89	4.10
Yes	95.99	96.11	95.90
Health-related factors			
Functional difficulty			
No difficulties	53.80	56.64	51.77
Difficulties in any type of the six activities	46.20	43.36	48.23
Health status			
Very poor	1.29	1.10	1.43
Poor	10.24	8.93	11.18
Fair	41.44	39.42	42.90
Good	41.54	43.90	39.85
Very good	5.49	6.66	4.65
Total	**100**	**100**	**100**
Number	**65,065**	**27,139**	**37,926**

In the descriptive statistics for independent variables (Table 4.2), the youngest age group (Young-old) has the highest proportion (61.10 per cent). The proportion of females is higher than the proportion of males in the middle-old and oldest-old categories. The majority of older persons are married (58.68 per cent). Among the older men, the proportion is noticeable high in the married category but lower in the widowed category. In contrast, the proportion of older women is almost equal in both the married (44.82 per cent) and widowed (44.43 per cent) categories.

About 70 per cent of older persons live in rural areas. It can be seen that a larger proportion of older men are living in rural areas than their counterparts. By the geographical areas, most of the older persons live in the middle area (39.36 per cent), followed by the coastal area (21.13 per cent). The majority of the older women live in the middle area. In terms of living arrangement, older persons living with at least one child have the highest proportion (71.30 per cent). It shows that the living arrangement follows the usual pattern (extended family or mixed arrangement) because it is customary for households to have multiple generations living together in Myanmar society. The percentage of older women living alone (6.71 per cent) is higher than that of older men (3.78 per cent).

Regarding socio-economic factors, among the older persons, 40.42 per cent has completed primary education as the highest proportion, followed by none (30.70 per cent). About 78.28 per cent of older women cannot access the secondary level of education. Most of the older persons are working as own account workers (22.67 per cent) (Males = 33.42 per cent and females = 14.99 per cent). Only a small proportion of older persons (14.02 per cent) receive any pension, allowance or benefits. The male beneficiaries are a little higher than the female ones. About 38.50 per cent are participating in community activities (recreation and sports; socialization like meeting friends; political meetings; art or cultural; educational; religious or humanitarian activities), with a 14-percentage point difference between males' and females' participation (46.42 per cent, and 32.83 per cent, respectively). As for household income status, the percentage of household income quintile is nearly equally distributed (about 20 per cent) in each quintile. There is not much difference in the proportion of quintiles by men and women. About 71.38 per cent of older persons live

in wooden or brick houses, and 95.99 per cent own houses. The distribution of housing variables in men and women is almost the same.

Regarding health-related factors, 46.20 per cent are facing at least one type of functional difficulty in hearing, seeing, walking, remembering, self-care, or communication. Among older persons, the prevalence rate of functional difficulty for females is higher than that of males. In general health, most of the older persons rated as having fair and good status (41.44 per cent and 41.54 per cent, respectively). Most older men rated their health as good, while most older women rated it as having fair health status.

4.2   Bivariate Analysis

Table 4.3 presents the bivariate analysis results for independent variables by level of life satisfaction of older persons. The bivariate analysis shows the relationship between each independent variable and life satisfaction.

Table 4.3 (i): Bivariate analysis for independent variables

Age		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	437.63***
	Males	6.89	19.86	49.79	23.46	143.77***
	Females	7.89	21.61	48.61	21.89	286.79***
Young-old	All	6.42	19.77	50.28	23.53	
	Males	6.15	18.91	50.74	24.20	
	Females	6.63	20.43	49.93	23.01	
Middle-old	All	8.09	21.59	48.43	21.89	
	Males	7.24	20.43	48.94	23.39	
	Females	8.66	22.37	48.08	20.88	
Oldest-old	All	11.62	25.08	44.42	18.87	
	Males	10.61	24.32	46.08	18.99	
	Females	12.21	25.53	43.46	18.80	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

It can be clearly seen that life satisfaction varies with different age groups, and the Young-old category has the highest proportion in both 'Fairly satisfied' and 'Very

satisfied' than other age groups. The older the age is, the lower the life satisfaction has. The Oldest-old category has the lowest life satisfaction as these older persons in that age group can face more functional difficulties and health problems than younger people. The percentages of age groups by gender follow the same pattern in life satisfaction.

Table 4.3 (ii): Bivariate analysis for independent variables

Marital status		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	267.55***
	Males	6.89	19.86	49.79	23.46	51.25***
	Females	7.89	21.61	48.61	21.89	187.05***
Never married	All	7.99	18.97	48.61	24.43	
	Males	8.98	18.43	48.18	24.42	
	Females	7.69	19.13	48.75	24.43	
Married	All	6.61	19.71	50.45	23.23	
	Males	6.54	19.49	50.21	23.76	
	Females	6.70	19.98	50.75	22.56	
Widowed	All	8.83	23.18	47.00	20.99	
	Males	7.81	21.34	48.61	22.25	
	Females	9.10	23.69	46.56	20.65	
Divorced/ Separated	All	7.77	19.03	44.83	28.37	
	Males	9.93	28.42	43.84	17.81	
	Females	8.83	23.67	44.35	23.14	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

Married older persons are more likely to be satisfied in life than never married, widowed and divorced/separated older persons. It can be a result of having a spouse/partner in their life that affects the life satisfaction of older persons.

Table 4.3 (iii): Bivariate analysis for independent variables

Place of residence		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	528.24***
	Males	6.89	19.86	49.79	23.46	233.93***
	Females	7.89	21.61	48.61	21.89	302.34***

Place of residence		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Urban	All	7.11	18.49	46.16	28.24	
	Males	6.68	17.15	46.62	29.54	
	Females	7.39	19.38	45.86	27.38	
Rural	All	7.63	21.89	50.36	20.12	
	Males	6.97	20.94	51.06	21.03	
	Females	8.12	22.60	49.83	19.45	

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

In this bivariate analysis, a higher proportion of older persons living in urban areas report being 'Very satisfied' in their life compared to older persons living in rural areas. Most people live in rural areas, and Myanmar is not fully urbanized, but the older persons living in urban areas can access more facilities.

Table 4.3 (iv): Bivariate analysis for independent variables

Geographical areas		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	976.62***
	Males	6.89	19.86	49.79	23.46	397.17***
	Females	7.89	21.61	48.61	21.89	595.28***
Moun-tainous	All	8.16	24.98	45.98	20.88	
	Males	7.41	23.74	47.14	21.71	
	Females	8.72	25.92	45.10	20.26	
Coastal	All	9.56	25.49	46.21	18.74	
	Males	8.76	24.30	47.54	19.40	
	Females	10.17	26.39	45.20	18.24	
Middle	All	5.67	16.76	53.15	24.42	
	Males	5.14	15.83	53.33	25.70	
	Females	6.03	17.40	53.02	23.55	
Lower	All	8.15	19.96	47.28	24.60	
	Males	7.67	18.65	48.15	25.53	
	Females	8.48	20.88	46.68	23.96	

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

The older persons in the middle area have the highest proportion reporting being satisfied in life at 77.57 per cent (Fairly satisfied and Very satisfied), followed

by the lower area at 71.88 per cent. Meanwhile, the coastal area has the lowest life satisfaction. The results of bivariate analysis for geographical areas by gender show that older men have little higher life satisfaction than older women in every geographical area.

Table 4.3 (v): Bivariate analysis for independent variables

Living arrangement		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	175.50***
	Males	6.89	19.86	49.79	23.46	82.47***
	Females	7.89	21.61	48.61	21.89	108.21***
Living alone	All	10.11	24.32	44.07	21.49	
	Males	8.59	23.41	45.76	22.24	
	Females	10.73	24.69	43.39	21.19	
Living with spouse (maybe anyone else but no children and grand-children)	All	8.38	23.21	47.56	20.85	
	Males	7.87	22.84	47.45	21.84	
	Females	8.99	23.65	47.70	19.66	
Living with at least one child (maybe anyone else)	All	6.98	20.36	49.77	22.89	
	Males	6.37	19.13	50.52	23.98	
	Females	7.44	21.27	49.21	22.08	
Living with grandchildren only (no child-ren)	All	8.72	23.25	48.20	19.83	
	Males	8.90	21.57	49.32	20.21	
	Females	8.61	24.33	47.47	19.59	
Others	All	8.15	19.08	49.09	23.68	
	Males	8.58	18.60	49.09	23.73	
	Females	7.98	19.26	49.10	23.66	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

This bivariate analysis significantly shows that living arrangement is related to life satisfaction. Older persons living with at least one child and the 'Others' category

have a high proportion reporting being satisfied in life. From a gender perspective, there is no pointed difference in the distribution of life satisfaction.

Table 4.3 (vi): Bivariate analysis for independent variables

Education level		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	814.19***
	Males	6.89	19.86	49.79	23.46	316.53***
	Females	7.89	21.61	48.61	21.89	466.23***
None	All	8.89	24.06	48.22	18.83	
	Males	7.59	23.35	50.04	19.02	
	Females	9.51	24.39	47.36	18.74	
Primary	All	7.10	21.13	49.75	22.02	
	Males	6.99	20.62	50.08	22.32	
	Females	7.17	21.45	49.54	21.83	
Secondary	All	6.55	18.32	49.24	25.89	
	Males	6.59	18.17	49.24	26.00	
	Females	6.50	18.53	49.24	25.73	
Higher	All	5.18	14.28	49.36	31.18	
	Males	4.92	14.33	49.74	31.01	
	Females	5.49	14.22	48.90	31.39	
Others	All	8.98	20.29	48.46	22.28	
	Males	8.66	19.60	48.91	22.82	
	Females	9.39	21.18	47.86	21.57	

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

This bivariate analysis result conveys the positive relationship between older persons' life satisfaction and level of education. Older persons with higher education are the most likely to be satisfied, which can be caused the relationship between higher education and good quality of life. When the results are studied by gender, there is also a positive relationship between life satisfaction and education level. But, the increase in life satisfaction based on their education level for older women is less than for older men.

Table 4.3 (vii): Bivariate analysis for independent variables

Employment status		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	359.59***
	Males	6.89	19.86	49.79	23.46	201.98***
	Females	7.89	21.61	48.61	21.89	133.36***
Not working	All	8.43	22.05	47.47	22.06	
	Males	8.29	21.56	46.94	23.20	
	Females	8.49	22.28	47.72	21.52	
Employee	All	6.07	21.85	50.02	22.06	
	Males	5.77	21.17	50.65	22.41	
	Females	6.69	23.19	48.76	21.36	
Employer	All	4.93	16.20	53.64	25.23	
	Males	5.06	15.86	54.58	24.50	
	Females	4.67	16.86	51.84	26.63	
Own account worker	All	5.85	18.01	52.73	23.41	
	Males	5.58	17.52	53.41	23.49	
	Females	6.28	18.79	51.64	23.29	
Helping in family business (without pay)	All	5.31	20.57	51.13	22.99	
	Males	4.89	19.74	49.70	25.67	
	Females	5.54	21.04	51.94	21.48	
Others	All	7.89	23.68	40.67	27.75	
	Males	6.27	24.72	40.59	28.41	
	Females	10.88	21.77	40.82	26.53	

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

The employment status variable of this study shows that the employers reported the highest proportion being satisfied in life at 78.87 per cent (Fairly satisfied and Very satisfied), closely followed by own account worker at 76.14 per cent. From the gender point of view, there is no significant difference in the distribution of life satisfaction. It can be seen that the higher the decision-making power, the greater the percentage of older persons having life satisfaction.

Table 4.3 (viii): Bivariate analysis for independent variables

Receiving pension, allowance or benefits		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	123.79***
	Males	6.89	19.86	49.79	23.46	59.91***
	Females	7.89	21.61	48.61	21.89	59.17***
No	All	7.51	21.30	49.33	21.86	
	Males	6.93	20.33	50.08	22.66	
	Females	7.92	21.97	48.81	21.30	
Yes	All	7.21	18.30	47.70	26.79	
	Males	6.63	17.32	48.22	27.83	
	Females	7.72	19.14	47.25	25.90	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

In this bivariate analysis, older persons receiving pension, allowance or benefits are more satisfied in their life than those with no pension, allowance or benefits. Among the beneficiaries, the life satisfaction of older men is higher than that of older women. This variable is one of the sources of income and financial assets which can measure older persons' well-being.

Table 4.3 (ix): Bivariate analysis for independent variables

Participation in community activities		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	300.98***
	Males	6.89	19.86	49.79	23.46	138.16***
	Females	7.89	21.61	48.61	21.89	138.91***
No	All	8.40	22.29	47.29	22.02	
	Males	7.91	21.72	47.76	22.61	
	Females	8.68	22.62	47.02	21.69	
Yes	All	6.00	18.61	52.00	23.39	
	Males	5.71	17.70	52.14	24.45	
	Females	6.29	19.54	51.86	22.32	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

Older persons who are participating in community activities have higher life satisfaction than those who are not. When the aged females are compared to the aged males, there is a lower degree of social participation and activities. This may increase the isolation of aged females and, consequently, lead to lower life satisfaction. Social participation is a resource of social networks that can influence older persons' life satisfaction.

Table 4.3 (x): Bivariate analysis for independent variables

Household income quintile		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	958.75***
	Males	6.89	19.86	49.79	23.46	408.65***
	Females	7.89	21.61	48.61	21.89	558.30***
Lowest	All	10.34	24.76	47.42	17.48	
	Males	9.57	23.88	48.38	18.17	
	Females	10.89	25.38	46.75	16.99	
Low	All	7.87	22.29	49.20	20.65	
	Males	7.47	20.76	49.94	21.83	
	Females	8.16	23.41	48.65	19.79	
Middle	All	7.19	21.50	49.39	21.92	
	Males	7.03	20.51	50.03	22.44	
	Females	7.30	22.21	48.93	21.56	
High	All	5.97	18.90	50.34	24.79	
	Males	4.91	17.92	51.22	25.96	
	Females	6.71	19.59	49.73	23.97	
Highest	All	5.60	16.41	49.44	28.55	
	Males	5.08	15.77	49.65	29.50	
	Females	5.97	16.88	49.29	27.86	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

From this bivariate analysis, the older persons with higher household income are more likely to be satisfied, which can be caused by the relationship between higher wealth status and a good standard of living, and also access to adequate health facilities. It can be seen that the higher the household income, the higher proportion reporting 'Very satisfied'; meanwhile, the lower the household income, the larger proportion reporting 'Unsatisfied'.

Table 4.3 (xi): Bivariate analysis for independent variables

Housing type		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	271.88***
	Males	6.89	19.86	49.79	23.46	110.77***
	Females	7.89	21.61	48.61	21.89	164.26***
Wooden or brick house	All	7.11	20.60	49.23	23.06	
	Males	6.59	19.40	49.88	24.13	
	Females	7.49	21.48	48.75	22.28	
Apartment	All	5.69	15.98	48.10	30.23	
	Males	5.35	15.71	48.36	30.59	
	Females	5.92	16.16	47.92	29.99	
Bamboo or temporary house	All	8.90	22.64	48.93	19.53	
	Males	8.10	22.06	49.79	20.05	
	Females	9.44	23.04	48.34	19.17	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

The housing type variable of this study shows that older persons living in an apartment have the highest proportion reporting being satisfied in life at 78.33 per cent, followed by wooden or brick house at 72.29 per cent. It can be seen that the higher the living quality and having durable housing units, the greater life satisfaction. Older men have slightly higher life satisfaction than older women in every housing type.

Table 4.3 (xii): Bivariate analysis for independent variables

House ownership		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	30.59***
	Males	6.89	19.86	49.79	23.46	15.02**
	Females	7.89	21.61	48.61	21.89	17.23**
No	All	9.96	20.22	45.96	23.86	
	Males	9.47	17.99	47.44	25.09	
	Females	10.29	21.74	44.95	23.02	
Yes	All	7.37	20.90	49.23	22.49	
	Males	6.78	19.93	49.89	23.40	
	Females	7.79	21.60	48.77	21.84	

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

The percentage reporting having life satisfaction is slightly different between older persons living in their own house (71.72 per cent) and those who are not (69.82 per cent). It can be that the housing environment and accessible facilities are more important than the ownership status in the life satisfaction of older persons. From a gender perspective, males reported higher life satisfaction than females.

Table 4.3 (xiii): Bivariate analysis for independent variables

Functional difficulty		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	2.3e+03***
	Males	6.89	19.86	49.79	23.46	911.13***
	Females	7.89	21.61	48.61	21.89	1.4e+03***
No difficul-ties	All	4.20	16.79	53.04	25.97	
	Males	4.03	16.06	53.37	26.54	
	Females	4.33	17.36	52.79	25.52	
Difficul-ties in any type of six activities	All	11.28	25.64	44.51	18.56	
	Males	10.61	24.82	45.12	19.44	
	Females	11.71	26.17	44.12	18.00	

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

As expected, older persons with no functional difficulties have higher life satisfaction than those with difficulties. Older persons with functional difficulties may feel useless and tired; which can become major constraints in achieving life satisfaction. Similar to other variables, men have higher life satisfaction than women.

Table 4.3 (xiv): Bivariate analysis for independent variables

Health status		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Total	All	7.47	20.88	49.10	22.55	1.2e+04***
	Males	6.89	19.86	49.79	23.46	5.1e+03***
	Females	7.89	21.61	48.61	21.89	7.3e+03***
Very poor	All	44.64	24.64	22.74	7.98	
	Males	43.29	24.50	23.15	9.06	
	Females	45.39	24.72	22.51	7.38	

Health status		Unsatisfied	Neutral	Fairly satisfied	Very satisfied	Chi-square
Poor	All	24.13	33.48	30.19	12.20	
	Males	23.61	34.71	30.05	11.64	
	Females	24.43	32.78	30.28	12.52	
Fair	All	7.92	28.25	44.80	19.02	
	Males	8.06	27.17	45.50	19.28	
	Females	7.84	28.96	44.35	18.86	
Good	All	2.59	12.49	61.09	23.83	
	Males	2.40	12.54	60.74	24.32	
	Females	2.75	12.45	61.36	23.44	
Very good	All	1.15	4.29	32.36	62.20	
	Males	1.11	4.15	33.92	60.82	
	Females	1.19	4.43	30.76	63.62	

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

The older persons who reported having very good health status have the highest percentage in 'Very satisfied' at 62.20 per cent, which is almost eight times higher than the very poor health status (7.98 per cent). There is a small gender difference in the distribution of life satisfaction among different levels of self-rated health status. From this bivariate analysis, the older persons with better health status are the most likely to be satisfied.

To summarise, the bivariate analysis (Chi-square test) of this study shows a significant association between all of the independent variables and the life satisfaction of older persons at p<0.05. Men have slightly higher life satisfaction compared to women. The possible explanation is that women may live longer than men in unhealthy conditions and alone. In addition, older persons' financial status is associated with physical and mental health and quality of life. Therefore, socio-economic conditions such as household income status can affect health status, resulting in gender differences.

4.3   Multivariate Analysis

4.3.1   Multinomial Logistic Regression

This section focuses on regression analysis undertaken to test the relative predictive power of demographic, socio-economic and health-related covariates with the level of life satisfaction of older persons. Multivariate regression techniques must be used to show the net effect of an explanatory variable on another dependent variable. Multivariate regression is a technique used to measure the degree to which the various independent variables and various dependent variables are related to each other. Many multivariate regression techniques exist. Multinomial logistic regression is used if the dependent variable is nominal. In the model of this study, the outcome is a four-category variable (Unsatisfied, Neutral, Fairly satisfied and Very satisfied) in which the base outcome is 'Unsatisfied'. Then, multinomial logistic regression is applied to examine the factors correlated with a specific type of life satisfaction: 'Neutral', 'Fairly satisfied' or 'Very satisfied' against the base outcome.

Tables 4.4, 4.5 and 4.6 summarize the multinomial logistic regression results examining factors related to older persons' life satisfaction. The model is statistically significant at $p<0.01$ in predicting older persons' life satisfaction.

As in Table 4.4, the first set of estimates compares older persons who reported 'Neutral' with those who reported 'Unsatisfied'. The regression shows that the following factors are significantly associated with the odds of being 'Neutral': age, place of residence, geographical areas, education level, employment status, household income quintile, housing type, house ownership, functional difficulty and health status. With regard to age, being older persons in the oldest-old group reduces the odds of reporting 'Neutral' by about 10 per cent (compared to the Young-old). If the respondents live in a rural area, the more likely that they would report 'Neutral' (RRR = 1.15). For geographical areas, the study finds that older persons living in coastal and lower areas are associated with a reduction in the odds of reporting 'Neutral' by about 13 per cent and 23 per cent, respectively (compared to those living in mountainous areas).

In terms of education level, older persons in "Others" category are less likely to report 'Neutral' (RRR = 0.85). Regarding employment status, the odds of reporting 'Neutral' for older persons working as own account workers are lower than that for older persons who are not working, with relative risks ratio of 0.90. Compared to the lowest quintile, other quintiles are positively associated with 'Neutral' life satisfaction for household income status. Compared to older persons living in wooden or brick house, those living in bamboo or temporary house are less likely to report 'Neutral' (RRR = 0.89). With regard to ownership status, older persons living in their own house are more likely to report 'Neutral' in their life satisfaction compared to their counterparts (RRR = 1.28).

Among health-related factors, the effect of having at least one type of functional difficulty on the odds of reporting 'Neutral' among older persons is 0.79 times lower compared to those with no difficulties. Also, self-rated health is significantly associated with the life satisfaction of older persons. The likelihood of reporting 'Neutral' for older persons who responded that they have poor (RRR = 2.42), fair (RRR = 5.91), good (RRR = 7.48) and very good (RRR = 5.54) health are higher than that for older persons who responded that they have very poor health.

Table 4.4: Multinomial logistic regression on 'Neutral' versus 'Unsatisfied'

Life satisfaction of older persons		Relative Risks Ratio	Robust Std. Err.
Age	Young-old	1.000	
	Middle-old	0.973	0.041
	Oldest-old	0.897*	0.050
Sex	Male	1.000	
	Female	0.993	0.039
Marital status	Never married	1.000	
	Married	1.004	0.102
	Widowed	1.004	0.097
	Divorced/Separated	1.029	0.162
Place of residence	Urban	1.000	
	Rural	1.145**	0.052
Geographical areas	Mountainous	1.000	
	Coastal	0.870**	0.045
	Middle	0.938	0.047
	Lower	0.771***	0.044
Living arrangement	Living alone	1.000	
	Living with spouse (maybe anyone else but no children and grandchildren)	1.036	0.094
	Living with at least one child (maybe anyone else)	1.044	0.076
	Living with grandchildren only (no children)	1.004	0.105
	Others	0.857	0.085
Education level	None	1.000	
	Primary	1.056	0.045
	Secondary	0.988	0.063
	Higher	0.955	0.077
	Others	0.852*	0.064
Employment status	Not working	1.000	
	Employee	1.108	0.103
	Employer	0.993	0.118
	Own account worker	0.901*	0.045
	Helping in family business (without pay)	1.158	0.107
	Others	0.908	0.187

Life satisfaction of older persons		Relative Risks Ratio	Robust Std. Err.
Receiving pension, allowance or benefits	No	1.000	
	Yes	1.038	0.058
Participation in community activities	No	1.000	
	Yes	0.955	0.037
Household income quintile	Lowest	1.000	
	Low	1.163**	0.058
	Middle	1.203***	0.062
	High	1.283***	0.073
	Highest	1.201**	0.070
Housing type	Wooden or brick house	1.000	
	Apartment	1.074	0.106
	Bamboo or temporary house	0.893**	0.037
House ownership	No	1.000	
	Yes	1.276**	0.107
Functional difficulty	No difficulties	1.000	
	Difficulties in any type of the six activities	0.788***	0.031
Health status	Very poor	1.000	
	Poor	2.424***	0.226
	Fair	5.914***	0.542
	Good	7.484***	0.744
	Very good	5.539***	1.097
Number of observations			65,065
Pseudo R2			0.0834

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

In Table 4.5, the second set of the estimates compares older persons who reported 'Fairly satisfied' with those who reported 'Unsatisfied'. Some of these results are similar, but others are different from the comparisons described in the first set. It can be seen that all variables affect the odds of 'Fairly satisfied' versus 'Unsatisfied' but not sex and marital status.

With respect to age, older persons in the oldest-old are significantly associated with the likelihood of reporting 'Fairly satisfied' compared to

'Unsatisfied'. Being the oldest-old reduces the odds of reporting 'Fairly satisfied' by about 14 per cent (compared to being the Young-old). For the place of residence, the older persons living in rural areas are more likely to be 'Fairly satisfied' than those living in urban areas by 17 per cent. Similarly, there is a difference between geographical areas. Older persons who live in coastal area have a negative relationship with the likelihood of answering 'Fairly satisfied' (RRR = 0.87); meanwhile, those who live in the middle area have a positive relationship with the likelihood of answering 'Fairly satisfied' (RRR = 1.57). For the living arrangement, older persons living with at least one child are more likely to report 'Fairly satisfied' than those living alone (RRR = 1.17).

Among socio-economic factors, for the level of education, there is a positive relationship between having primary, secondary or higher education and the odds of being 'Fairly satisfied' among older persons. If there is a one unit increase in education level, the multinomial log-odds for preferring 'Fairly satisfied' to 'Unsatisfied' would be expected to increase by 1.11 times in primary, 1.14 times in secondary and 1.28 times in higher education level. For the employment status, the odds of reporting 'Fairly satisfied' for older persons working in "Others" category are less than that for older persons who are not working (RRR = 0.66). Significantly, receiving pension, allowance or benefits among older persons increases the odds of reporting 'Fairly satisfied' versus 'Unsatisfied' by 1.20 times. The older persons who participated in community activities are more likely to have higher odds of answering 'Fairly satisfied' than the reference group, with a relative risk ratio of 1.16.

According to the household income status results, older persons in the lowest quintile are the least likely to be satisfied with their lives. The odds of reporting 'Fairly satisfied' for the older person steadily increase from lowest to low, to middle, to high, to highest quintiles by 22 per cent, 26 per cent, 48 per cent and 52 per cent, respectively. For the housing variables, compared to older persons living in wooden or brick house, those living in bamboo or temporary house are less likely to report 'Fairly satisfied' (RRR = 0.82). If older persons particularly live in their own house, the more likely that they would report being 'Fairly satisfied' in their life, with a relative risk ratio of 1.43.

Among health-related factors, older persons with at least one type of functional difficulty are less likely to report 'Fairly satisfied' than those with no difficulties by 36 per cent. In addition, self-rated health is significantly associated with the life satisfaction of older persons. For each health status level, the relative risks ratio is increasing. The odds of reporting 'Fairly satisfied' for older persons who had poor (RRR = 2.21), fair (RRR = 8.61), good (RRR = 31.03) and very good (RRR = 34.20) health are higher than that for older persons who had very poor health. As expected, the better the health status rates, the higher the probability of being satisfied.

Table 4.5: Multinomial logistic regression on 'Fairly satisfied' versus 'Unsatisfied'

Life satisfaction of older persons		Relative Risks Ratio	Robust Std. Err.
Age	Young-old	1.000	
	Middle-old	1.015	0.040
	Oldest-old	0.860**	0.047
Sex	Male	1.000	
	Female	1.044	0.040
Marital status	Never married	1.000	
	Married	1.034	0.100
	Widowed	0.936	0.087
	Divorced/Separated	0.822	0.127
Place of residence	Urban	1.000	
	Rural	1.169***	0.051
Geographical areas	Mountainous	1.000	
	Coastal	0.872**	0.044
	Middle	1.568***	0.076
	Lower	0.960	0.052
Living arrangement	Living alone	1.000	
	Living with spouse (maybe anyone else but no children and grandchildren)	0.945	0.083
	Living with at least one child (maybe anyone else)	1.173*	0.083
	Living with grandchildren only (no children)	1.100	0.111
	Others	0.912	0.086
Education level	None	1.000	
	Primary	1.110*	0.045
	Secondary	1.143*	0.069
	Higher	1.283**	0.097
	Others	0.975	0.070
Employment status	Not working	1.000	
	Employee	0.946	0.085
	Employer	1.185	0.134
	Own account worker	1.003	0.047
	Helping in family business (without pay)	1.130	0.101
	Others	0.655*	0.131

Life satisfaction of older persons		Relative Risks Ratio	Robust Std. Err.
Receiving pension, allowance or benefits	No	1.000	
	Yes	1.196**	0.063
Participation in community activities	No	1.000	
	Yes	1.161***	0.043
Household income quintile	Lowest	1.000	
	Low	1.221***	0.059
	Middle	1.264***	0.063
	High	1.480***	0.080
	Highest	1.523***	0.085
Housing type	Wooden or brick house	1.000	
	Apartment	1.174	0.108
	Bamboo or temporary house	0.815***	0.033
House ownership	No	1.000	
	Yes	1.433***	0.115
Functional difficulty	No difficulties	1.000	
	Difficulties in any type of the six activities	0.644***	0.024
Health status	Very poor	1.000	
	Poor	2.213***	0.214
	Fair	8.609***	0.810
	Good	31.028***	3.116
	Very good	34.200***	6.306
Number of observations			65,065
Pseudo R2			0.0834

Note: Statistically significant at p< 0.01***, p< 0.05**, p< 0.1*

The last set of estimates in Table 4.6 compares older persons who reported 'Very satisfied' with those who reported 'Unsatisfied'. It can be seen that there are only three factors that have no relationship with the odds of being 'Very satisfied', namely sex, marital status and employment status. In contrast, other variables affect the odds of reporting 'Very satisfied' compared to 'Unsatisfied'. Regarding age, being in the oldest-old reduces the odds of reporting 'Very satisfied' by around 18 per cent. According to the place of residence, if older persons are living in rural areas, they are less likely to report 'Very satisfied' compared to those living in

urban areas (RRR = 0.85). In terms of geographical areas, the regression shows a similar pattern to the second set of estimates. Older persons living in coastal areas have a negative relationship with the odds of being 'Very satisfied' (RRR = 0.79); meanwhile, those living in the middle area have a positive relationship with the odds of being 'Very satisfied' (RRR = 1.64). With regards to the living arrangement, older persons living with spouse and "Others" category are less likely to report 'Very satisfied' than those living alone by about 18 per cent and 26 per cent, respectively.

For the education variable, the odds of reporting 'Very satisfied' in life for the older persons who have completed primary level increase by 19.40 per cent, secondary level increase by 28.00 per cent and higher level increase by 49.90 per cent compared to those who have no education. This regression result conveys that older persons' education level has a positive and statistically significant impact on life satisfaction. The other variables of socio-economic factors: receiving pension, allowance or benefits and participation in community activities, have the same direction. The older persons who received any pension, allowance or benefits and who participated in community activities are more likely to respond 'Very satisfied' in their life than those of the reference groups with relative risks ratios of 1.28 and 1.14, respectively, compared to base outcome 'Unsatisfied'.

For household income status, as expected, the older persons in the lowest quintile are the least likely to be satisfied in their life. The older persons in the highest quintile have a much higher odds of being 'Very satisfied', by 91.90 per cent, than those in the lowest quintile. The higher the household income quintile is, the higher the level of life satisfaction will be. In housing type, older persons living in an apartment are more likely to answer 'Very satisfied' in life (RRR = 1.23) than the reference group. However, older persons living in bamboo or temporary house are less likely to answer 'Very satisfied' in life (RRR = 0.76) than the reference group. In ownership status, older persons living in their own house have higher odds of answering 'Very satisfied' in their life than their counterparts by 59.40 per cent.

Concerning health-related factors, older persons with at least one type of functional difficulty are less likely to report 'Very satisfied' in life than those with no difficulties by around 39 per cent. As predictable, the better the health status rates,

the higher the odds of answering 'Very satisfied' will be. Interestingly, the health status rating of older persons is positively associated with the likelihood of being 'Very satisfied', and it can be observed a large gap between the reference group-very poor (RRR = 1.00) and very good (RRR = 176.63).

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Table 4.6: Multinomial logistic regression on 'Very satisfied' versus 'Unsatisfied'

Life satisfaction of older persons		Relative Risks Ratio	Robust Std. Err.
Age	Young-old	1.000	
	Middle-old	1.006	0.043
	Oldest-old	0.821**	0.049
Sex	Male	1.000	
	Female	1.034	0.042
Marital status	Never married	1.000	
	Married	0.935	0.097
	Widowed	0.851	0.085
	Divorced/Separated	0.761	0.127
Place of residence	Urban	1.000	
	Rural	0.854**	0.040
Geographical areas	Mountainous	1.000	
	Coastal	0.787***	0.044
	Middle	1.640***	0.086
	Lower	0.956	0.056
Living arrangement	Living alone	1.000	
	Living with spouse (maybe anyone else but no children and grandchildren)	0.821*	0.079
	Living with at least one child (maybe anyone else)	1.047	0.082
	Living with grandchildren only (no children)	0.962	0.108
	Others	0.737**	0.076
Education level	None	1.000	
	Primary	1.194***	0.053
	Secondary	1.280***	0.083
	Higher	1.499***	0.119
	Others	1.160	0.090

Life satisfaction of older persons		Relative Risks Ratio	Robust Std. Err.
Employment status	Not working	1.000	
	Employee	0.846	0.082
	Employer	1.085	0.129
	Own account worker	0.985	0.050
	Helping in family business (without pay)	1.145	0.109
	Others	1.025	0.212
Receiving pension, allowance or benefits	No	1.000	
	Yes	1.281***	0.072
Participation in community activities	No	1.000	
	Yes	1.137**	0.045
Household income quintile	Lowest	1.000	
	Low	1.330***	0.071
	Middle	1.393***	0.076
	High	1.691***	0.099
	Highest	1.919***	0.115
Housing type	Wooden or brick house	1.000	
	Apartment	1.234*	0.119
	Bamboo or temporary house	0.759***	0.033
House ownership	No	1.000	
	Yes	1.594***	0.139
Functional difficulty	No difficulties	1.000	
	Difficulties in any type of the six activities	0.614***	0.025
Health status	Very poor	1.000	
	Poor	2.576***	0.363
	Fair	10.136***	1.389
	Good	33.339***	4.721
	Very good	176.630***	36.854
Number of observations			65,065
Pseudo R2			0.0834

Note: Statistically significant at $p < 0.01$***, $p < 0.05$**, $p < 0.1$*

In summarizing the multinomial logistic regression of this study, the first set of estimates (Neutral versus Unsatisfied) has five variables which have no relationship with the odds of answering 'Neutral' in life satisfaction; sex, marital status, living arrangement, receiving pension, allowance or benefits and participation in community activities. In the second set (Fairly satisfied versus Unsatisfied), only two variables, sex and marital status have no relationship with the base outcome. Moreover, the last set (Very satisfied versus Unsatisfied) has three unrelated variables: sex, marital status and employment status. Therefore, in this regression, sex and marital status are common insignificant variables, and these variables cannot determine the life satisfaction of older persons. In contrast, the study observes that some factors like education level, receiving pension, allowance or benefits, participation in community activities, household income quintile, house ownership and health status have the same direction and positive relation to life satisfaction.

In addition, it can be seen that an urban setting is essential to get higher life satisfaction of older persons in observing the place of residence by the different three sets. According to the results of living arrangement, it is showing that older persons living with at least one child are more likely to attain higher life satisfaction in concord with the Myanmar context. It can be noticed that participation in community activities is another important factor for life satisfaction. The older persons who contribute more to social activities are more likely to have higher life satisfaction. This model concludes that having higher education, having a higher household income, living in a better house, and being a better health status are the key factors in determining the life satisfaction of older persons.

4.3.2 Multicollinearity Test

The multicollinearity test is used before conducting binary logistic regression analysis of older persons' life satisfaction from the gender perspective. According to the study of Field (2009), a tolerance value less than 0.1 and a VIF value greater than 10 showed a serious multicollinearity problem. The tolerance and VIF of this study present that there is no problem with multicollinearity (see Table 4.7).

Table 4.7: Tolerance and VIF for independent variables

Variables	Tolerance	VIF
Age	0.80	1.25
Sex	0.88	1.14
Marital status	0.84	1.20
Place of residence	0.79	1.26
Geographical areas	0.93	1.07
Living arrangement	0.92	1.09
Education level	0.83	1.21
Employment status	0.83	1.21
Receiving pension, allowance or benefits	0.87	1.15
Participation in community activities	0.92	1.08
Household income quintile	0.86	1.16
Housing type	0.95	1.05
House ownership	0.94	1.06
Functional difficulty	0.84	1.19
Health status	0.87	1.16

4.3.3   **Binary Logistic Regression**

The findings from the multinomial logistic regression (Table 4.4, Table 4.5 and Table 4.6) did not show a significant difference in gender of older persons in association with life satisfaction. Thus, the test of mean differences (t-test and ANOVA test) is examined between independent variables and life satisfaction to support the binary logistic regression. The t-test is used to compare the means between two categories, whereas ANOVA is used to compare the means among three or more categories. According to these tests of mean differences, there is a relationship between all of the independent variables including sex and life satisfaction of older persons. The results are statistically significant and they stand at only $p < 0.05$ in house ownership and at $p < 0.01$ in other variables (see Appendix).

The binary logistic regression is executed by sex to investigate whether there are gender differences in the determinants of life satisfaction among older persons while controlling for other intervening factors. In this model, the outcome is a binary variable, in terms of 'Satisfactory' versus 'Not satisfactory'. Table 4.8 shows the result of the binary logistic regression examining factors related to older persons' life satisfaction between men and women. The models are statistically significant at $p < 0.01$ in predicting older men's and older women's life satisfaction and the independent variables.

The binary logistic regression shows interesting results. In both men and women, age groups are an inverted U-shaped relationship with life satisfaction. For men, the middle-old group is more likely to be satisfied in life than the young-old (OR = 1.07). For women, the oldest-old group is less likely to be satisfied in life than the young-old (OR = 0.90). Regarding marital status for older men, never married men are more likely to be satisfied than those who are divorced/separated. Marital status in the model for older women do not show a statistically significant association with life satisfaction. For geographical areas, both men and women living in the middle area are more likely to be satisfied in life than those living in mountainous area (RRR = 1.60 and 1.72, respectively). Also, men and women living in the lower area are more likely to report having life satisfaction than those living in mountainous area (RRR = 1.13 and 1.20, respectively). Concerning living arrangement, older

women living with spouse are 0.85 times less likely to be satisfied than those living alone. For older men, the living arrangement is not statistically significant.

The logistic regression conveys that the education level of men and women has a positive and statistically significant impact on their life satisfaction. The odds of being satisfied for older men who completed higher level increases by 38.80 per cent than that of the men who have no education. The odds of being satisfied for older women who completed primary level increases by 10.90 per cent, secondary level increases by 27.20 per cent, higher level increases by 39.10 per cent and "Others" category by 15.40 per cent than that of the women who have no education. In every education level, the odds ratio of being satisfied in life for women is higher than for men. As regards employment status, interestingly, both older men and older women working as employees have negative impacts on life satisfaction compared to those not working with odds ratios of 0.89 and 0.81, respectively. The older men working as own account workers are more likely to be satisfied in their life than those not working with odds ratios 1.11.

In both models, the older persons who received any pension, allowance or benefits (OR = 1.17 for men and OR = 1.21 for women) and who participated in community activities (OR = 1.21 for men and OR = 1.19 for women) are more likely to be satisfied in life than those of the reference groups. As expected for the household income quintile, the older men and women in the lowest quintile are the least likely to be satisfied in life. The odds of being satisfied for the older women steadily increase from lowest to low, to middle, to high, to highest quintiles by 8.60 per cent, 14.10 per cent, 24.80 per cent and 43.90 per cent, respectively. For older men, those in low quintile (15.80 per cent), middle quintile (10.70 per cent), high quintile (30 per cent) and highest quintile (39.10 per cent) are more likely to be satisfied than those in lowest quintile.

For the housing type, older women living in the apartment are 1.18 times more likely to be satisfied in their lives than those living in the wooden or brick house. In contrast, older men and older women living in the bamboo or temporary house are less likely to be satisfied in their lives with odds ratios of 0.87 and 0.88, respectively. For house ownership status, the statistical significance is found only in

the women model: older women who live in their own house are 30.80 per cent more likely to be satisfied in life than those who do not live in their own house.

Regarding health-related factors, older men and women with at least one type of functional difficulty are about 23 per cent less likely to be satisfied in life than those with no difficulties. For self-rated health status, there is a strong positive relationship with life satisfaction among older men and women. The odds of being satisfied for older men who had poor (OR = 1.42), fair (OR = 3.20), good (OR = 9.02) and very good (OR = 26.81) health are higher than that for older men who had very poor health. For older women, those who had poor (OR = 1.61), fair (OR = 3.27), good (OR = 9.67) and very good (OR = 27.06) health are higher in life satisfaction than those who had very poor health.

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Table 4.8: Binary logistic regression of older persons' life satisfaction

Life satisfaction of older persons	Men		Women	
	Odds ratio	**Robust Std. Err.**	**Odds ratio**	**Robust Std. Err.**
Age				
Young-old	1.000		1.000	
Middle-old	1.071*	0.039	1.010	0.030
Oldest-old	0.940	0.052	0.902*	0.038
Marital status				
Never married	1.000		1.000	
Married	0.995	0.105	1.028	0.071
Widowed	0.991	0.106	0.898	0.059
Divorced/Separated	0.703*	0.109	0.851	0.098
Place of residence				
Urban	1.000		1.000	
Rural	0.956	0.039	0.958	0.031
Geographical areas				
Mountainous	1.000		1.000	
Coastal	0.930	0.042	0.953	0.037
Middle	1.600***	0.068	1.721***	0.061
Lower	1.131*	0.056	1.197***	0.049
Living arrangement				
Living alone	1.000		1.000	
Living with spouse (maybe anyone else but no children and grandchildren)	0.924	0.086	0.853*	0.058
Living with at least one child (maybe anyone else)	1.125	0.094	1.090	0.056
Living with grandchildren only (no children)	1.064	0.116	1.059	0.080
Others	0.947	0.100	0.977	0.067
Education level				
None	1.000		1.000	
Primary	1.037	0.041	1.109***	0.033
Secondary	1.115	0.056	1.272***	0.063

Life satisfaction of older persons	Men		Women	
	Odds ratio	**Robust Std. Err.**	**Odds ratio**	**Robust Std. Err.**
Higher	1.388***	0.086	1.391***	0.082
Others	1.118	0.069	1.154*	0.073
Employment status				
Not working	1.000		1.000	
Employee	0.885*	0.056	0.806**	0.065
Employer	1.156	0.090	1.214	0.125
Own account worker	1.111**	0.042	1.064	0.040
Helping in family business (without pay)	1.058	0.083	0.979	0.056
Others	0.823	0.114	0.828	0.157
Receiving pension, allowance or benefits				
No	1.000		1.000	
Yes	1.167**	0.056	1.214***	0.050
Participation in community activities				
No	1.000		1.000	
Yes	1.207***	0.038	1.189***	0.033
Household income quintile				
Lowest	1.000		1.000	
Low	1.158**	0.052	1.086*	0.040
Middle	1.107*	0.051	1.141***	0.043
High	1.300***	0.063	1.248***	0.050
Highest	1.391***	0.069	1.439***	0.059
Housing type				
Wooden or brick house	1.000		1.000	
Apartment	1.073	0.088	1.175*	0.078
Bamboo or temporary house	0.871***	0.032	0.875***	0.027
House ownership				
No	1.000		1.000	
Yes	1.142	0.093	1.308***	0.085

Life satisfaction of older persons	Men		Women	
	Odds ratio	Robust Std. Err.	Odds ratio	Robust Std. Err.
Functional difficulty				
No difficulties	1.000		1.000	
Difficulties in any type of the six activities	0.770***	0.025	0.762***	0.021
Health status				
Very poor	1.000		1.000	
Poor	1.415**	0.188	1.607***	0.161
Fair	3.200***	0.411	3.266***	0.317
Good	9.024***	1.175	9.668***	0.958
Very good	26.809***	4.447	27.058***	3.841
Constant	0.336***	0.065	0.291***	0.042
Number of observations		27,139		37,926
Pseudo R square		0.1220		0.1211

Note: Statistically significant at p< 0.01*, p< 0.05**, p< 0.1***

To sum up binary logistic regressions, the men model has three variables which have no relationship with life satisfaction; place of residence, living arrangement and house ownership. However, in the women model, only two variables (marital status and place of residence) have no relationship with life satisfaction. Therefore, in this regression, the place of residence cannot determine the life satisfaction of older persons while studying from a gender point of view. These models conclude that living arrangement patterns and house ownership status determine the life satisfaction of older women compared to older men. Besides, it shows that the effects of each marital status are different between men and women. Never married men are the most satisfied persons. Also, men working as own account workers are more likely to have higher life satisfaction.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

This study aims to examine the relationship between socio-economic factors and life satisfaction among older persons in Myanmar. A comprehensive analysis is undertaken using data from the 2019 Myanmar Inter-censal Survey. According to the conceptual framework for this study, the outcome variable of interest is life satisfaction among older persons. Explanatory variables included in the framework are demographic characteristics (age, sex, marital status, place of residence, geographical areas and living arrangement), socio-economic characteristics (education level, employment status, receiving pension, allowance or benefits, participation in community activities, household income quintile, housing type and house ownership) and health-related characteristics (functional difficulty and health status).

5.1   Discussion and Conclusion of the Results

To summarise the background characteristics of older persons, descriptive statistics are presented. Using the Chi-square test, bivariate analyses are also used to explore the relationship between dependent and independent variables. Multinomial logistic regression is used to investigate the determinants of the life satisfaction of older persons while controlling for other factors. Binary logistic regression is used to investigate whether there are gender differences in the determinants of the life satisfaction of older persons.

In this study, 65,065 older persons in the 2019 Myanmar Inter-censal Survey are analysed; among them, 27,139 (41.71 per cent) are 'Males', and 37,926 (58.29 per cent) are 'Females'. Most of the older persons belong to 'Fairly satisfied' at 49.10 per cent, while fewer older persons fall in 'Unsatisfied' at 7.47 per cent. In Myanmar, older persons are mostly satisfied in life because life satisfaction is a subjective question which is usually based on their perception. The bivariate analysis from this study shows a significant association between all of the independent variables and the life satisfaction of older persons at $p<0.05$, including socio-economic factors.

The multinomial logistic model is also used to determine the association between socio-economic factors while controlling for the effect of other demographic and health-related determinants. The multinomial logistic regression from this study

shows that among the demographic factors age impacts on life satisfaction of older persons. The findings regarding age groups show an inverted U-shaped relationship with life satisfaction while comparing the base outcome 'Unsatisfied' with 'Fairly satisfied' and 'Very satisfied'. This is consistent with previous studies on life satisfaction across the lifespan (Baird et al., 2010). When individuals are approaching the oldest-old age group, income and social support decline. This may cause increased reliance and loss of close relationships. As a result, this may be attributable to their deteriorating health condition and reduced energy levels that affect their overall life satisfaction.

As for the location factors, there are considerable differences in life satisfaction between urban and rural areas. While comparing the base outcome 'Unsatisfied' with 'Neutral' and 'Fairly satisfied', older persons living in rural areas are substantially higher in life satisfaction than those living in urban areas. However, in comparison with 'Very satisfied', the relationship is reversed: older persons living in urban areas have higher life satisfaction than those living in rural areas. It can be seen that this study reports that an urban setting can give the highest level of life satisfaction. The possible dominant factor associated with the urban and rural differential is the better socio-economic situations in urban areas, which is associated with better public infrastructure, higher levels of social participation, and better health care coverage. Another feasible explanation is that the probability of living with children may be higher in urban areas than in rural areas because of the migration of the younger generation to the city in search of better opportunities for jobs and education.

This study shows the differences in life satisfaction by geographical areas. Geography and the environment have a much large influence on life satisfaction. The older persons living in the middle area are more likely to satisfy with their life. It is associated with better transportation and easier access to basic infrastructures. In addition, this area has more plentiful goods, services and employment. These findings show the important implications for effective social protection strategies in geographical areas. On the other hand, lower levels of life satisfaction in certain areas can also be the fact that the climate of that area significantly influences older persons'

well-being. For example, in the coastal area, the adult population tend to migrate to other cities or abroad to seek a job or start business activities because of climate change and uncertainty of agricultural and fishery works.

Subsequently, older persons who are not living with their children may be negatively associated with their life satisfaction. The result also shows that older persons living with at least one child are likely to be satisfied with their life. This is consistent with previous studies (Xu et al., 2019). As expected, older persons from developing countries are living with their adult children and other relatives (United Nations, 2017b). Myanmar older people are mostly living with their adult child(ren) or other relatives, as shown in the descriptive statistics of this study. Since its society has respected the value of older people, when they are sick, they have got help in daily activities and care from their adult children, especially their daughters (Knodel, 2013). Nearly all the needs of an individual are fulfilled within the family. They get higher life satisfaction as they have obtained full family support, such as physical or emotional care.

The study's key findings showed that education level is positively associated with life satisfaction. Older persons with higher education are the most likely to be satisfied with their life. This result is consistent with some previous studies (Schimmel, 2013). Well-educated older people tend to have higher opportunities to earn higher income which is also positively associated with life satisfaction. It can be seen that the more highly-educated persons tend to have had more employment opportunities and a more lucrative earnings history, which should have led to a sustainable income in their retirement years. Then, it has affected the respondents' attitudes toward traditional family norms and their participation in social activities.

In regard to employment status, with increasing life satisfaction, the older persons working as employers and helping in the family business have more chance to answer 'Fairly satisfied' than those referenced group. It may be because they have a higher level of independence that can lead to higher satisfaction levels in one's work. Meanwhile, employees with little decision-making power and tight control over their salary and working hours can negatively affect their satisfaction at work (Benz & Frey, 2004). It can be seen that these older employees do not have the choice to seize

the job due to financial necessity. In contrast, employment status is statistically insignificant in the response of 'Very satisfied'. It can be seen that this study reports that older persons who are not involved in the labour force can get more life satisfaction.

In addition, the two variables, receiving pension, allowance or benefits and participation in community activities, are more important determinants for 'Fairly satisfied' and 'Very satisfied' than 'Neutral' compared to 'Unsatisfied'. Older persons who receive pension or allowance have a higher level of satisfaction. This is consistent with other studies (Chen et al., 2022). Having a sustainable income in older age is crucial to feeling a sense of security and independence. The pensioned older persons may also feel less of a burden on working-age household members and/or take pride in their ability to contribute to the household income. It is attributable to their active engagement and contribution to society while earning an income for their sustenance. The result shows that older persons participating in community activities are likely to satisfy and coincide with the findings of other studies (Pinquart & Sorensen, 2001). Older people may experience positive effects such as autonomy and self-sufficiency when performing community activities. Community activities are a way to stay in contact with peers and others in the neighbourhood, which confers a sense of belonging. That also provides an incentive to remain healthy and physically active, which are attributes often correlated with life satisfaction.

According to the findings, the household income quintile has a positive effect; the rich will bring happiness. This result is consistent with the previous study (Kahneman & Deaton, 2010). Older persons from well-off households have the highest satisfaction because they have the means to consume goods and services to maximize their utility and life satisfaction. On the other hand, the households in the lowest income quintile use their resources for the most basic needs. These findings show that a safety net is needed for the well-being of older persons.

In terms of housing status, older persons who live in apartments have a higher satisfaction level, which is consistent with the previous study (Coates et al., 2015). The type of housing and its environment can provide them and chance to make sure good life. Better housing is not just a source of shelter but can facilitate access to

employment and recreational facilities to live healthy and safe lifestyles. Regarding house ownership, older persons who live in a house they own (or their family home) are more likely to satisfy their life. This finding is consistent with other studies (Coates et al., 2015). House ownership is a key factor in determining housing satisfaction. It can give a greater sense of control over owned housing and represent expectations fulfilled for life satisfaction.

For health-related factors, this study has detected that functional difficulty is a factor that significantly affects life satisfaction. This is consistent with the previous report (Nguyen et al., 2013). Older persons with functional difficulties rate their life satisfaction lower than do those without difficulties once they receive assistance from others and devices. One of the most significant determinants of life satisfaction is the perception of his/her health status. Consistent with expectations and previous research (Røysamb et al., 2003), self-rated good health was significantly related to being more satisfied with life. According to the top-down model, happy people tend to be satisfied with all aspects of their lives, including their health. It can be assumed that if the individual has experienced negative life events such as functional difficulty and poor health status, these may increase psychological distress and, in turn, can lower life satisfaction.

This study used binary logistic regression to approach the life satisfaction of older persons from a gender perspective. These regressions find the three main points between men and women. The first point is the effect of location. Although the place of residence has no relationship with the life satisfaction of both older men and older women, geographical areas have a relationship with their life satisfaction. Older persons, especially older women, are underprivileged ones; therefore, they may face more effects of uneven development across geographical areas than the younger generation. Second, the life satisfaction of older women is largely determined by their living arrangement. Older women living with at least one child and living with grandchildren are more satisfied than those living alone. In contrast, older women living with spouse have lower life satisfaction because they may have more desire to rely on their younger generation rather than their partner. It highlights that living with their children/grandchildren could be the best for older women as they may decrease

their loneliness, stress and depression by increasing perceived physical and mental support. Lastly, in terms of housing conditions, women are more sensitive than men regarding housing type and house ownership. Housing variables are the main factors for older women's life satisfaction as their home provides the assurance of safety and privacy they need to thrive.

To summarise, life satisfaction is very important for older persons' quality of life and is an indicator of successful ageing. Therefore, well-being, connection with family, a sense of belonging and security, and safety contribute to life satisfaction for older persons. Different socio-economic backgrounds hinder older persons from performing well in society and could deplete their life satisfaction. This study suggests that not only socio-economic factors are associated with the life satisfaction of older persons in Myanmar but also geographical areas, living arrangement, and health-related factors. Moreover, the ageing process presents Public Health challenges in this setting. Therefore, effective social security schemes, such as Social Safety Net, are required to perform for tackling the uneven socio-economic status among older persons. These are mechanisms that older persons can access when they face hardship conditions affecting their capacity to access basic needs and services.

5.2   Limitations of the Study

This study is based on the 2019 MICS cross-sectional survey. Therefore, it cannot determine the direction of causation and can only determine the association between the dependent and independent variables. This survey covered only Conventional Households and hence, did not cover older persons living in Institutions and the homeless population. Moreover, this study cannot analyse how ethnicity and religion are associated with the life satisfaction of older persons, as the information is not available in the survey. As the self-rated questions are subjective questions based on their perception, older persons can become relatively adjustable to unfavourable circumstances and conditions. Sometimes, they will give a dishonest answer; their sense of Well-Being depends on their current mood when responding to the questionnaire.

5.3 Policy Recommendations

This study suggests that having a higher household income, living in developed areas, living in a better house, and being in a better health status are the key factors in determining the life satisfaction of older persons. In addition, two dimensions of MIPAA are to ensure "Advancing health and well-being into old age" and "Ensuring enabling and supportive environments". The number of Myanmar older persons face declining health-based life satisfaction including disabilities are negatively influenced by external factors such as limited access to appropriate and affordable health care. With a growing number of older persons, it is challenging to ensure that older persons live in better health and with low rates of age-related disabilities. Also, the majority of older persons in Myanmar still live in multi-generational, familial households and they rely on only family carers for basic needs because of inadequate available formal services, health care services and social pensions, and lack of sustainable housing for an ageing society. Therefore, socio-economic security and public health services could play important programmes in getting the life satisfaction of older persons.

According to the findings of this study, the government have to implement policies to help older persons to live the last phase of their life with purpose, dignity and peace. Below are some policy recommendations based on the results,

1) As geographical areas are associated with the life satisfaction of older persons, the government should promote equality in terms of geographical areas so that all older persons can access social pension and universal health care coverage equally. These programmes should completely align with the areas where the population needs the most help.

2) As the older persons in the lowest household income quintile are least likely to be satisfied in their life, the government should enhance social assistance programmes to reduce the burden of older persons and allow them to access the programmes without discrimination. These programmes offer support either in the form of direct cash transfers or through a variety of in-kind benefits.

3) As the older persons who have very poor health status are least likely to be satisfied in their life, the government should provide healthy ageing policies to enhance the life satisfaction of older persons. These policies aim to improve the entire well-being of older persons and affect economic and physical security of vulnerable and disadvantaged older persons.

4) As the housing types and ownership status are related to the life satisfaction of older persons, the government should implement housing policies and programmes which impact the quantity and quality of affordable, sustainable housing for an ageing society. These policies and programmes mainly focus on vulnerable population and consider the facts of convenience to physical and community services as well as healthy and secure living environments in housing developments.

5) As there are gender differences in the determinants of life satisfaction of older persons and focusing on gender equality is also one of the MIPAA's highlighted issues, the policies and programmes for older persons should be gender-sensitive programmes. These programmes include every opportunity to promote gender equality and facilitate the mobilisation of older women for quality of life.

5.4   Recommendations for Further Research

This study has found an important linkage between demographic, socio-economic and health-related factors and the life satisfaction of older persons in Myanmar based on quantitative analysis. Therefore, future studies should focus on understanding the qualitative aspects of older person's perception of their life, including religion, culture and value systems within Myanmar society.

The study has also focused on the life satisfaction of older persons but not their entire Subjective Well-Being. This study has been based on one aspect of Subjective Well-Being (Life satisfaction) but did not express other aspects of Subjective Well-Being (Positive affect and Negative affect). Further studies would enhance understanding of all aspects of Subjective Well-Being among older persons in Myanmar. In such a study, the factors that determine Subjective Well-Being among

older men and women may be different, and it is important to approach it from the gender perspective.

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จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

APPENDIX

The relationship between dependent and independent variables

Independent variables		Number of obs:	Life satisfaction Mean ± SD	p-value
Age	Young-old	39,752	0.74 ± 0.44	<0.01[b]
	Middle-old	17,938	0.71 ± 0.46	
	Oldest-old	7,375	0.64 ± 0.49	
Sex	Male	27,139	0.74 ± 0.45	<0.01[a]
	Female	37,926	0.71 ± 0.46	
Marital status	Never married	4,581	0.74 ± 0.45	<0.01[b]
	Married	38,178	0.74 ± 0.45	
	Widowed	21,448	0.68 ± 0.47	
	Divorced/Separated	858	0.66 ± 0.48	
Place of residence	Urban	19,434	0.75 ± 0.44	<0.01[a]
	Rural	45,631	0.71 ± 0.46	
Geographical areas	Mountainous	13,034	0.67 ± 0.48	<0.01[b]
	Coastal	13,747	0.65 ± 0.48	
	Middle	25,611	0.78 ± 0.42	
	Lower	12,673	0.72 ± 0.45	
Living arrangement	Living alone	3,569	0.66 ± 0.48	<0.01[b]
	Living with spouse (maybe anyone else but no children & grandchildren)	6,791	0.69 ± 0.47	
	Living with at least one child (maybe anyone else)	46,396	0.73 ± 0.45	
	Living with grandchildren only (no children)	2,637	0.69 ± 0.47	
	Others	5,672	0.73 ± 0.45	

Independent variables		Number of obs:	Life satisfaction Mean ± SD	p-value
Education level	None	19,976	0.68 ± 0.48	<0.01[b]
	Primary	26,299	0.72 ± 0.46	
	Secondary	7,985	0.76 ± 0.44	
	Higher	7,241	0.81 ± 0.40	
	Others	3,564	0.71 ± 0.46	
Employment status	Not working	41,839	0.70 ± 0.47	<0.01[b]
	Employee	2,783	0.73 ± 0.45	
	Employer	2,049	0.79 ± 0.41	
	Own account worker	14,753	0.77 ± 0.43	
	Helping in family business	3,223	0.75 ± 0.44	
	Others	418	0.69 ± 0.47	
Receiving pension, allowance or benefits	No	55,943	0.72 ± 0.46	<0.01[a]
	Yes	9,122	0.75 ± 0.44	
Participation in community activities	No	40,015	0.70 ± 0.47	<0.01[a]
	Yes	25,050	0.76 ± 0.44	
Household income quintile	Lowest	14,350	0.65 ± 0.48	<0.01[b]
	Low	12,800	0.70 ± 0.46	
	Middle	12,854	0.72 ± 0.46	
	High	12,053	0.76 ± 0.44	
	Highest	13,008	0.78 ± 0.42	
Housing type	Wooden or brick house	46,444	0.73 ± 0.45	<0.01[b]
	Apartment	3,023	0.79 ± 0.42	
	Bamboo or temporary house	15,598	0.69 ± 0.47	
House ownership	No	2,611	0.70 ± 0.46	<0.05[a]
	Yes	62,454	0.72 ± 0.46	

Independent variables		Number of obs:	Life satisfaction Mean ± SD	p-value
Functional difficulty	No difficulties	35007	0.80 ± 0.41	<0.01[a]
	Difficulties in any type of the six activities	30058	0.64 ± 0.49	
Health status	Very poor	840	0.31 ± 0.47	<0.01[b]
	Poor	6,664	0.43 ± 0.50	
	Fair	26,966	0.64 ± 0.49	
	Good	27,026	0.85 ± 0.36	
	Very good	3,569	0.95 ± 0.23	

Note: "a" for t-test, "b" for ANOVA test

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