

FACTORS INFLUENCING SELF-CARE ABILITY AMONG THE ELDERLY IN MYANMAR

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Abstract

With the rapidly growing aging population in Myanmar, effective self-care practices have become increasingly important for ensuring the well-being and independence of the elderly. This study investigates the relationship between self-care ability and various demographic and socioeconomic factors among the elderly population in Myanmar, using data from the 2019 Inter **Census** Survey. Descriptive analysis revealed that while most elderly individuals reported no difficulty with self-care, they did not meet the criteria for successful aging due to limited engagement in active and productive activities. Pearson's Chi-square test indicated that variables such as gender, age, place of residence, marital status, education, general health status, occupation, household income, and participation in social activities were significantly associated with self-care ability. Binary logistic regression analysis further demonstrated that poor general health, rural residence, and living in Rakhine State negatively impacted self-care ability, while higher educational attainment, increased income, female gender, marital status, employment, social engagement, and residence in certain regions (e.g., Kayin, Kachin, Mandalay, etc.) had a positive effect. These findings highlight the urgent need for comprehensive government interventions to support the elderly population, including improvements in healthcare access, expansion of social protection, enhancement of long-term and mental health care services, and the promotion of social inclusion.

Keywords: Self-care ability, Elderly, Inter **Census** Survey, Health care system, Social Protection, Quality of Life

Introduction

The global demographic landscape is undergoing prominent changes, particularly with the respect to the aging population. A significant change in the distribution of population towards older ages is the aging population. This is usually reflected in an increase of the population's mean and median age. Furthermore, it is widespread across the world and advanced in the most highly developed countries (Garrouste, 2014).

World Health Organization (WHO, 2010) expressed that the world's elderly are the result of the continued decline in fertility rates and increased life expectancy. Moreover, Bucher (2014) pointed out that the current trends in aging or the rejuvenation of the population might be due to the interaction between several demographic and socioeconomic factors.

In recent years, Myanmar has been experiencing a significant increase in its aging population. In the next 30 years, the number of aging populations in Myanmar will almost triple. Moreover, the number of elderly aged 60 years and above is projected to grow from 4.5 million to 13 million as the 20 percent of the population by 2050 (Department of Population, 2017). To address the challenges of growing population, it is needed to promote quality of life and live independently and enhance the self-care ability of aging population in Myanmar as long as possible. In fact, self-care ability is recognized as a critical determinant in managing the daily lives of elderly individuals and is inherently a multidimensional concept closely linked to health outcomes (Hoy et al., 2007).

In Myanmar, older adults face a range of challenges, including limited access to healthcare

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services, economic instability, social isolation, and inadequate mental health support, all of which contribute to heightened vulnerability and hinder their capacity for self-care. This study aims to examine self-care ability among the elderly in Myanmar by analyzing its association with key demographic and socioeconomic factors. Understanding these relationships is essential for addressing the barriers faced by older adults and fostering conditions that support their independence and well-being. Enhancing self-care among the elderly not only improves their quality of life but also enables them to remain active contributors to society for offering guidance to younger generations, participating in the labor force, and alleviating pressure on national economic systems.

Literature Review

Hoy et al. (2007) conducted a comprehensive review aimed at developing an understanding of self-care as a health resource among the elderly, with a particular focus on its role in health promotion. The study primarily examined literature on medical self-care prior to 1989, highlighting its supplementary function alongside professional healthcare services. Utilizing primary data sources, the researchers employed an interactive comparison of data and matrix displays to analyze key themes related to self-care. The findings revealed a two-dimensional construct of self-care, encompassing both the action capabilities and the processes necessary for maintaining health, thereby positioning self-care as a critical component of elder health resource strategies.

Sundsli et al. (2012) reported that on the ability for self-care in urban living older people in Southern Norway. In this study, it was revealed that some other European countries have experienced more increase in longevity than Norway. The main objective was to express the self-care ability among home-dwelling elders who are living in urban areas in Southern Norway. It was only emphasized on the aspects of the general living conditions, sense of coherence, screened nutritional state, physical activity, perceived self-reported health, mental health, and perceived life situation. And then, it was applied to the univariate and multivariate statistical methods with a randomized sample of 1044 men and women aged 65 years and above living in urban areas in Southern Norway. The **result** was that only eighteen three percentage of participants had higher self-care ability for themselves. Moreover, self-care agency, perceived good health, being active, being frequently active, good mental health, not being at risk of undernutrition and life satisfaction had a significant positive impact on the self-care ability, whereas the perceiving helplessness, receiving home nursing, being anxious, and being at a more advanced age had a significant negative impact on the self-care ability. This study was also observed that people who are aged 85 years and above had worse mental health, less physically active and more at risk of undernutrition.

TABRIZI et al. (2018) reported on self-care ability of older people living in urban areas of Northwestern Iran. In this study, it was a cross-sectional study done in 2015. Totally, 220 sample data were collected by using the valid and reliable questionnaire (Persian version). Sampling was conducted through systematic random method. As statistical methods, **were** applied to descriptive **statistics**, independent t-test, one-way ANOVA, Mann-Whitney, Kruskal-Wallis test and Kolmogorov-Smirnov test. According to the results, it was observed that 96.8% of participating elderlies had poor self-care ability. The educational level, life status, employment

status and marital status had significant relations with self-care ability of elder people, whereas gender, income source, and insurance status had no relations with self-care ability of the elderly people. In addition to, it was also found that self-care ability of elder people in Tabriz was at weak level.

Wei and Zhang (2020) submitted analysis of the influencing factors on the preferences of the elderly for the combination of medical care and pension (CMCP) in long-term care facilities based on the Andersen model. The main purpose was to investigate the status quo and factors that influenced on the preferences of the elderly for the combination of medical care and pension (CMCP) in long-term care (LTC) facilities and to provide an evidence-based basis for building a multi-tiered, continuous LTC system with CMCP. This study was mainly emphasized on 3260 elder people who are aged 60 years with a multi-stage sampling method. And also, it was applied to the Chi-square test and binary logistic regression analysis based on the Andersen model. Based on the results, age, education level, residence, income, and self-care ability had the greatest impact on the preference for CMCP.

Noohi (2022) emphasized on the self-care ability of the elderly and related factors. The main purpose was to evaluate the influencing factors on self-care ability among elderly. It was used as the cross-sectional study. This study was conducted on 175 people who are aged over 60 years with the convenience sampling. Based on the results, it was observed that 69% of the participants had lower self-care ability. And also, it was found that men have significantly lower self-care ability than women. Moreover, self-care ability decreased with increased age. It can also be seen that the self-care ability was significantly lower at the lower level of education. And also, rural residents had significantly less self-care ability than urban residents. Married elder people and the elders with a higher level of income had significant positive impact on the self-care.

In previous research, the relationship between self-care ability and various demographic and socio-economic factors among the elderly has been extensively explored. Building upon this foundation, this study primarily focuses on examining self-care ability, a critical determinant in the management of daily activities and overall well-being among older adults. In fact, the study aims to address key research questions through clearly defined objectives that seek to identify and analyze the influence of demographic and socio-economic variables on the self-care capacities of the elderly population. These objectives are:

- to investigate the self-care ability and the demographic and socioeconomic characteristics of the elderly in Myanmar,
- to examine the relationship between the self-care ability and demographic and socioeconomic characteristics of the elderly in Myanmar, and
- to analyze the demographic and socioeconomic factors influenced on the self-care ability among the elderly in Myanmar.

Materials & Methods

Measures

This study was emphasized on the self-care ability among elderly in Myanmar as the outcome variable, which is measured as having difficulty in self-care ability or not. Moreover, the

explanatory variables such as demographic and socioeconomic characteristics among Myanmar elderly were selected from the previous researchers. However, there are some limitations in regard of 2019 ICS data. Hence, the demographic characteristics and socioeconomic characteristics being expected to have impact on self-care ability among Myanmar elderly are gender, place of residence, age, marital status, location, education, general health status, occupation, household annual income and engaging in any social activities. The classification of outcome variable and explanatory variables is expressed in Appendix Table (1).

Data

For this research, it was utilized the survey data which were collected from the 2019 Inter **Census** Survey, Department of Population (DOP) under the Ministry of Labour, Immigration and Population of the Republic of the Union of Myanmar. Those data capture was undertaken using Computer-Assisted Personal Interviewing (CAPI) system. However, it was only covered Conventional Households and designed to produce district level data (Department of Population, 2020). It represents in fact the nationally representative samples of 548,553 individuals in 132,092 selected households were interviewed. In this research, a sample of 61453 aging population who were aged 60 years and above was applied to study the self-care ability in Myanmar.

Methods

This study was applied to the descriptive analysis which is used to describe the demographic and socioeconomic characteristics of the elderly in Myanmar and Pearson's Chi-square test which is to examine the relationship between self-care ability and those characteristics of the elderly in Myanmar. Furthermore, binary logistic regression is also mainly employed to analyze the self-care ability by the demographic and socioeconomic characteristics of the Myanmar elderly.

Binary Logistic Regression Model

Binary logistic regression is utilized when the researcher desires to model the relationship between a binary dependent variable and one or more independent variables. In this study, it was attempted to model the likelihood of self-care ability in a sample of 61453 elderly **persons** in Myanmar. The response variable in logistic regression is usually dichotomous and Bernoulli random variable with two possible values, value 1 with a probability of success, $P(Y=1) = \pi$, or the value 0 with probability of failure $P(Y=0) = 1-\pi$. This type of variable is also called a binary variable. The binary logistic regression model in the usual form is

$$Y_i = E(Y_i) + \varepsilon_i$$

Since the distribution of the error term ε_i depends on the Bernoulli distribution of the response Y_i . The expected value of each Y_i is

$$E(Y_i) = \pi_i = \frac{\exp(\beta_0 + \beta_1 X_{1i} + \dots + \beta_k X_{ki})}{1 + \exp(\beta_0 + \beta_1 X_{1i} + \dots + \beta_k X_{ki})}$$

Where, $E(Y_i)$ = conditional mean given the value of X_i

β_0 = the constant of the equation

β_i = the coefficient of the predictor variable i

The logit transformation of the probability of i^{th} elderly who are not having difficulty in self-care ability should be written as linear combinations of predictors which can be shown as follows:

$$\text{Logit}(\pi_i) = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 X_{1i} + \dots + \beta_k X_{ki}$$

The exponential function of the regression coefficient is the odd ratio which is associated with a one-unit crease in the exposure (El-Habil, 2012). To be **validated** model, it was used the goodness of fit which describe how well it fits a set of observations. There are various diagnostics analyses being needed to conduct before estimating the coefficient for assessing the appropriateness of the developed logistic regression model. Moreover, goodness of fit commonly used in statistics are: the Wald test, Pearson's Chi-square, the likelihood ratio test and Hosmer and Lemeshow Goodness of fit test (Hosmer and Lemeshow, 2000).

Findings

Descriptive analysis

The analysis presented in Table (2) highlights the demographic and socioeconomic characteristics of 61,453 elderly individuals included in the study. The findings reveal that the majority (90.9%) do not report difficulties with self-care, suggesting a relatively high level of functional independence. The sample is predominantly composed of female (58.4%), married (57.5%), and unemployed (88.9%) individuals, with a significant proportion residing in rural areas (69.7%) and falling within the 60–69 age group. Geographically, the highest concentrations of elderly are found in Mandalay and Sagaing (each 13.6%), followed by Ayeyarwady (11.3%) and Yangon (10.9%), while Kayah records **were found to have** the lowest elderly population. Educational attainment is generally low, with 47.4% having completed below primary or primary education. In terms of health, 45.2% report good health status, and 56.0% belong to households with an annual income ranging from 10 to 50 lakh kyats. Notably, a significant proportion (62.4%) are not engaged in any form of social activity. These findings suggest that while many elderly individuals in Myanmar may be experiencing aspects of healthy aging in terms of self-care and perceived health status, the low levels of social engagement and economic activity indicate an absence of productive and active aging, thereby falling short of the criteria for successful aging. Therefore, it is recommended that the government and policymakers prioritize the development of comprehensive, community-based programs that integrate health literacy initiatives, strengthen rural healthcare infrastructure, and foster social participation to promote successful aging among Myanmar's older population.

Bivariate analysis

This study was applied to Pearson Chi-square test as the bivariate analysis to examine the association between self-care ability and demographic and socioeconomic factors influenced on it among Myanmar elderly **people**. The results of this test are exposed in Appendix Table (3). These results pointed out that the association between self-care ability and all of the demographic and socioeconomic characteristics of the Myanmar elderly such as gender, place of residence, age, marital status, location, education, general health status, occupation, household annual income and engaging in any social activities are statistically significant at the 1% level. Based on the significant associations identified, it is recommended that government and policymakers develop targeted and inclusive aging policies that address key demographic and socioeconomic disparities such as gender, education, income, and social engagement to enhance self-care ability and promote the well-being of the elderly population in Myanmar.

Multivariate analysis

In this study, binary logistic regression was employed as the primary analytical method to examine the influence of demographic and socioeconomic characteristics on self-care ability among the elderly in Myanmar. The model fitting statistics and parameter estimates for the binary logistic regression analysis are presented in Appendix Tables (4) and (5).

This study employed several model fitting criteria—including the Omnibus Test of Model Coefficients, Hosmer and Lemeshow Goodness-of-Fit Test, -2 Log Likelihood, Cox & Snell R^2 , Nagelkerke R^2 , and overall correct classification rate to assess the adequacy of the binary logistic regression model in predicting self-care ability among the elderly in Myanmar. The Omnibus Test of Model Coefficients yielded a Chi-square value of 92,838.710, which was statistically significant at the 1% level, indicating that the model with one or more explanatory variables provides a significantly better fit than a null model without predictors. The Hosmer and Lemeshow Test produced a Chi-square statistic of 39.984, also significant at the 1% level, suggesting a potential lack of fit between the predicted and observed values; however, it is important to acknowledge that such global goodness-of-fit tests may not definitively reflect model inadequacy when the p-value is significant. The likelihood ratio Chi-square statistic was 28,305.784, further supporting the model's predictive capability. In terms of explanatory power, the Cox & Snell R^2 and Nagelkerke R^2 values were 0.14 and 0.35, respectively, indicating that 14% to 35% of the variance in self-care ability can be explained by the included demographic and socioeconomic variables. Finally, the model correctly classified 91.4% of elderly individuals aged 60 years and above, demonstrating a high level of predictive accuracy.

In this study, the elderly who are having difficulty in self-care ability is chosen as reference level. It means that the elderly who are not having difficulty in self-care ability have to be compared against the reference category. According to the results of binary logistic regression, the female elder people are about 0.098 times more likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the male elder people. And then, the elder people who are living in rural area are about 0.091 times less likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people who are living in urban area. It was also observed that the elder people who are aged with in 70-79 years and 80 years and above are about 0.543 times and 0.837 times less likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people who are aged with in 60-69 years.

Moreover, the married elder people are about 0.224 times more likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the never married elder people. By the case of location, the elder people who are living in Kayin, Kachin, Bago, Magway, Mandalay, Mon, Yangon, Shan, Saging and Naypyitaw are about (0.534, 0.410, 0.558, 0.256, 0.664, 0.209, 0.592, 0.596, 0.220 and 0.306) times more likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people who are living in Ayeyawady. However, the elder people who are living in Rakhine state are about 0.446 times less likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people who are living in Ayeyawady.

According to the educational attainment, the elder people who have completely attained below primary and primary school, middle school and high school and above are about (0.262, 0.315 and 0.312) times more likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people who have not completely attained any education level. Furthermore, the elder people with fair and poor health level are about 0.665 and 0.910 times less likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people with good health level.

By the case of occupation, the employed **elderly** people are about 1.2473 times likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the unemployed elderly people. And then, the elderly people who have got the household annual income with ten to fifty lakhs and above fifty lakhs are about 0.115 times and 0.207 times more likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elder people who have got the household annual income below 10 lakhs. By the case of engaging in any social activities, the elderly people who are engaging in any social activities are about 1.898 times more likely to have not any difficulty in self-care ability than having difficulty in self-care ability compared to the elderly people who are not engaging in any social activities.

According to the comparison of elderly having difficulty in self-care ability and elderly having no difficulty in self-care ability, it was observed that gender, place of residence, age, marital status, location, education, general health status, occupation, household annual income and engaging in any social activities are mainly influenced on the self-care ability among elderly in Myanmar. Hence, it is imperative for the government to implement comprehensive, evidence-based aging policies that prioritize equitable access to healthcare, social support, and economic resources to improve self-care capacity and quality of life for Myanmar's elderly population.

Discussion

Globally, population aging presents a significant public health challenge, affecting both developed and developing countries. Myanmar, in particular, is experiencing a rapid increase in its elderly population, as evidenced by recent demographic assessments. This study examines the demographic and socioeconomic determinants of self-care ability among the elderly in Myanmar through descriptive analysis, Pearson's Chi-square tests, and binary logistic regression. The findings indicate that while some aspects of healthy aging may be present, the majority of older adults in Myanmar are not experiencing productive or active aging. Consequently, the elderly population in Myanmar has not yet achieved the standards of successful aging, highlighting the need for targeted interventions to support their well-being.

The self-care **ability** is worse in male elderly, the elderly living in rural areas, the never married elderly, unemployed elderly, lower household annual income and the elderly people with poor health level. Sundsli et al. (2012) indicated that older people might have a positive impact on their health and self-care ability. Those results are in line with some results of Myanmar in this study. Moreover, Myanmar elderly people who are living in Mandalay and **Sagaing**, people who have got the annual income of 10-50 lakh are mostly included. And then, most of them are the people who have attained the below

primary and primary but they are largely not **participate** in any social activities and **remained** unemployed. It can also be seen that self-care ability decreased with increasing age but it increased with higher educational level, general health level and annual household income.

As another similar finding, Wei and Zhang (2020) stated that the elderly have higher needs for life care and medical care than others. The elderly in rural areas had greater needs, especially the personal care, medical care, and psychological counseling, compared to those in urban areas. Hence, some results are in consonance with the similar outcomes of Myanmar in this study. Additionally, the similar findings were found out in a studying of Noohia (2022) stated that elder men, elder people who are aged over 70 years, the elders living in the village, loneliness, lack of income and low education level had a lower self-care ability.

Hoy et al. (2007) also stated that having the self-care ability can improve health and prevent illness and disabilities of the elder people. In this study, it was offered insight into self-care as a significant health resource of elders with different health status. Hence, the results of that study are in consonance with the result of Myanmar that the elder people with increasing the general health level are more likely to have not any difficulty in self-care ability. The similar findings were found by studying of TABRIZI (2018) presented that the factors such as education, life status, employment and marital status had significant relation with self-care ability of elder people. Additionally, it was observed that the higher education had a significant impact on the self-care ability of elder people. The elder people with the higher education level are able to make decision and have the judgment power to manage the daily live activities. There are in fact the relationship with the better job opportunities and the higher income. Thus, those general results are in keeping with the results of Myanmar in this study.

Conclusion

Addressing the challenges faced by the elderly population in Myanmar requires a coordinated and holistic strategy involving government authorities, policymakers, and healthcare providers. Key interventions should include the implementation of targeted, community-based programs that promote health literacy, equitable access to healthcare services, and active social participation. This involves designing demographically appropriate educational initiatives, strengthening rural healthcare infrastructure, and fostering social engagement to reduce isolation. Moreover, increasing financial assistance for low-income older adults and encouraging interdisciplinary collaboration between healthcare and social service sectors are essential measures. Collectively, these efforts aim to empower elderly individuals to improve self-care practices and enhance their overall health and quality of life.

Future research on self-care ability among the elderly in Myanmar should prioritize precise estimation through comprehensive and systematic data collection to inform the development of evidence-based policies and programs. According to the varying degrees of difficulty experienced by older adults in managing self-care, it is essential to examine key influencing factors such as multimorbidity, health literacy, self-assessed health status, mental well-being, and resilience. These elements collectively offer a comprehensive framework for understanding the determinants of self-care capacity in this population.

Additionally, longitudinal studies are warranted to monitor changes in self-care abilities over time, particularly in response to targeted interventions or shifts in health conditions. Such research will provide critical insights for designing effective strategies and fostering interdisciplinary collaboration that supports the holistic well-being of the elderly in Myanmar.

Although Myanmar has made some progress in addressing the needs of its aging population, there remains a critical need for more comprehensive policy reforms, including the introduction of a limited social pension, to ensure that older adults can age with dignity and adequate support. Drawing on effective elderly care models from other countries, Myanmar can develop a more robust framework tailored to its socio-economic context. A holistic approach—encompassing improved access to healthcare, educational initiatives, and support for physical, mental, and social well-being—is essential to enhance the self-care capacity of the elderly. Such integrated strategies would foster healthy, active, and productive aging, enabling older individuals to maintain independence, improve their quality of life, and alleviate the burden on families and healthcare systems.

Acknowledgements

First and foremost, I would like to express my profound gratitude to Prof. Dr. Tin Tin Htwe, Rector, and Prof. Dr. Tin Tin Wai, Pro-Rectors of Yangon University of Economics, for granting me the opportunity to undertake and submit this research. I am especially indebted to Professor Dr. Hlaing Hlaing Moe, Head of the Department of Applied Statistics, Yangon University of Economics, for her invaluable guidance, insightful suggestions, and constructive feedback, all of which significantly contributed to the improvement of this study. I also extend my sincere thanks to the Ethics Review Committee for their careful evaluation and approval of this research. My deepest appreciation goes to the Director General and Deputy Director General of the Department of Population, Ministry of Labour, Immigration and Population, for providing access to the 2019 Inter **Census** Survey (ICS) data, which served as the foundation for this research. Furthermore, I am truly grateful to all faculty members of the Department of Applied Statistics, Yangon University of Economics, for their academic support and encouragement throughout my studies. Finally, I wish to express my heartfelt appreciation to my family and teachers for their unwavering support, inspiration, and belief in me throughout this journey.

References

- Bucher, S. (2014). Selected Indicators of Population ageing in the World: Trends, Impacts and Consequences. *Geographica Pannonica*, 18, 26-33.
- Department of Population (2017). The 2014 Myanmar Population and Housing Census, The Thematic Report, Ministry of labour, Immigration and Population, Nay Pyi Taw, Myanmar.
- Department of Population (2020), *The 2019 Inter-censal Survey, the Union Report*, Ministry of Labour, Immigration and Population, Nay Pyi Taw, Myanmar.
- El-Habil, A.M. (2012). An Application on Multinomial Logistic Regression Model. *Faculty of Economics and Administrative Sciences*, 8(2): 271-291. <https://doi.org/10.18187/pjsor.v8i2.234>
- Garrouste, C. (2014). Aging Population. In A.C. Michalos (Ed.), *Encyclopedia of Quality of life and Well-Being Research* (pp. 110-111). Springer, Dordrecht.
- Hosmer, D.W., & Lemeshow, S. (2000). *Applied Logistic Regression* (2nd ed.). New York: Wiley, J. & Sons, Inc.
- Hoy, B., Wagner, L., & Hall, E.O. (2007). Self-care as a health resource of elders: an interview review of the concept. *Scand J Caring Sci*, 21, 456-466. <https://pubmed.ncbi.nlm.nih.gov/18036008>
- Noohi, S., Karamitanha, F., & Shoghil, A. (2022). Self-Care Ability of the Elderly and Related Factors. *Preventive Care in Nursing and Midwifery Journal*. 12(4): 19-25.

Sundsli, K., Soderhamn, U., Espnes, G., A., & Soderhamn, O., Ability for self-care in urban living older people in Southern Norway. *J Multidiscip Healthc*, 5, 85-95. <https://pubmed.ncbi.nlm.nih.gov/22536079>

TABRIZI, J., S., BEGHADAMI, M., A., SAADATI, M., & SODERHAMN, U., (2018), Self-care Ability of Older People Living in Urban Areas of Northwestern Iran. *Iran J Public Health*, 47(12): 1899-1905. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6379604/>

WHO (2010). Ageing: Global Population.

Wei, Y., & Zhang, L., (2020). Analysis of the influencing factors on the Preferences of the Elderly for the Combination of Medical Care and Pension in Long-Term Care Facilities Based on the Andersen Model. Xiamen, Xiamen University. *International Journal of Environmental Research and Public Health*, 17, 54-36. <https://doi:10.3390/ijerph17155436>

APPENDIX

Table (1) Classification of outcome variable and explanatory Variables

Dependent Variable Y= Self-Care Ability among Elderly = 0 if Self-care of elderly has difficulty =1 if Self-care of elderly has not any difficulty Independent Variables Demographic Factors X1= Gender = 1 if male = 2 if female X2= Place of residence = 1 if urban = 2 if rural X3= Age = 1 if 60-69 years = 2 if 70-79 years = 3 if 80 years and above X4= Marital Status = 1 if single (never married) = 2 if married = 3 if widowed and divorced/separated	X5 =Location = 1 if Ayeyarwady = 2 if Kayah = 3 if Kayin = 4 if Chin = 5 if Kachin = 6 if Tanintharyi = 7 if Bago = 8 if Magway = 9 if Mandalay = 10 if Mon = 11 if Rakhine = 12 if Yangon = 13 if Shan = 14 if Saging = 15 if Nay Pyi Taw Socioeconomic Factors X6= Education = 1 if no education = 2 if below primary and primary school = 3 if middle school = 4 if high school and above X7= General Health Status = 1 if good = 2 if fair = 3 if poor X8= Occupation = 1 if unemployed = 2 if employed X9 = Household Annual Income = 1 if below 10 lakh = 2 if 10-50 lakh = 3 if above 50 lakh	X10 =Engaging in Any Social Activities = 1 if no = 2 if yes
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Table (2) Percent Distribution of Demographic and Socioeconomic Characteristics among Elderly in Myanmar

Variables	Categorization	Number	Percent
Self-Care Ability among Elderly	No	5609	9.1
	Yes	55844	90.9
Gender	Male	25549	41.6
	Female	35904	58.4
Place of residence	urban	18601	30.3
	Rural	42852	69.7
Age	60-69 years	35309	57.5
	70-79 years	18438	30.0
	80 years and above	7706	12.5
Marital Status	Single (never married)	4209	6.8
	Married	35326	57.5
	Widowed and Divorce/Separated	21918	35.7
Location	Ayeyawady	6949	11.3
	Kayah	622	1.0
	Kayin	2356	3.8
	Chin	1140	1.9
	Kachin	2231	3.6
	Tanintharyi	1948	3.2
	Bago	5292	8.6
	Magway	5958	9.7
	Mandalay	8327	13.6
	Mon	2532	4.1
	Rakhine	1406	2.3
	Yangon	6729	10.9
	Shan	6069	9.9
	Saging	8370	13.6
	Naypyitaw	1524	2.5
Education	No education	14603	23.8
	Below Primary and Primary school	29145	47.4
	Middle school	7385	12.0
	High school and above	10320	16.8
General Health Status	Good	27798	45.2
	Fair	25219	41.0
	Poor	8436	13.7
Occupation	No	54644	88.9
	Yes	6809	11.1
Household Annual Income	Below 10 lakh	15712	25.6
	10-50 lakh	34400	56.0
	Above 50 lakh	11341	18.5
Engaging in Any Social Activities	No	38321	62.4
	Yes	23132	37.6

Source: 2019 Myanmar Inter-censal Survey

Table (3) Bivariate Analysis of Self-care Ability by Demographic and Socioeconomic Characteristics among Elderly in Myanmar

Demographic and Socioeconomic Characteristics		Chi-square	P-value
Gender	Male Female	110.535****	0.000
Place of residence	urban Rural	30.374***	0.000
Age	60-69 years 70-79 years 80 years and above	5158.578****	0.000
Marital Status	Single (never married) Married Widowed and Divorce/Separated	938.984****	0.000
Location	Ayeyawady Kayah Kayin Chin Kachin Tanintharyi Bago Magway Mandalay Mon Rakhine Yangon Shan Saging Naypyitaw	414.307****	0.000
Education	No education Below Primary and Primary school Middle school High school and above	538.561****	0.000
General Health Status	Good Fair Poor	5470.070****	0.000
Occupation	No Yes	488.866****	0.000
Household Annual Income	Below 10 lakh 10-50 lakh Above 50 lakh	150.635****	0.000
Engaging in Any Social Activities	No Yes	1542.148****	0.000

Note: ****, **, * represent 1 percent, 5 percent and 10 percent level of significance. Source: 2019 Myanmar Inter-censal Survey

Table (4) Model Fitting Information for Self-care ability among Elderly in Myanmar

Model fitting criteria	χ^2 value	d.f	P-value
Omnibus Test of Model Coefficient	92838.710	29	0.000
Hosmer and Lemeshow (H-L) Test	39.984	8	0.000
-2Log Likelihood	28305.784		
Cox & Snell R-square	0.140		
Nagelkerke R-square	0.350		
Overall Correct Prediction	91.4 %		

Note: ***, **, * represent 1 percent, 5 percent and 10 percent level of significance.

Source: 2019 Myanmar Inter-censal Survey

Table (5) Parameter Estimates of Binary Logistic Regression Model for Self-care ability among elderly in Myanmar

Independent variables		Coef.	S.E	Wald	P-value	Odds Ratio
Constant		3.181***	0.106	897.226	0.000	24.063
Gender	Male (ref.)					
	Female	0.094***	0.036	6.772	0.009	1.098
Place of residence	Urban (ref.)					
	Rural	-0.096**	0.040	5.674	0.017	0.909
Age	60-69 years (ref.)					
	70-79 years	-0.783***	0.039	400.098	0.000	0.457
	80 years and above	-1.815***	0.043	1800.879	0.000	0.163
Marital Status	Single(never married)(ref.)					
	Married	0.202***	0.068	8.935	0.003	1.224
	Widowed and Divorced/Separated	-0.070	0.067	1.097	0.295	0.932
Location	Ayeyawady (ref.)					
	Kayah	0.220	0.148	2.226	0.136	1.246
	Kayin	0.428***	0.092	21.600	0.000	1.534
	Chin	-0.077	0.100	0.586	0.444	0.926
	Kachin	0.344***	0.093	13.715	0.000	1.410
	Tanintharyi	0.085	0.096	0.776	0.378	1.088
	Bago	0.444***	0.071	39.164	0.000	1.558
	Magway	0.228***	0.065	12.150	0.000	1.256
	Mandalay	0.510***	0.064	62.774	0.000	1.664
	Mon	0.190**	0.090	4.463	0.035	1.209
	Rakhine	-0.591***	0.092	41.410	0.000	0.554
	Yangon	0.465***	0.071	43.266	0.000	1.592
	Shan	0.467***	0.073	40.564	0.000	1.596
	Saging	0.199***	0.061	10.498	0.001	1.220
	Naypyitaw	0.267**	0.113	5.576	0.018	1.306
Education	No education (ref.)					
	Below Primary and Primary school	0.233***	0.039	35.723	0.000	1.262
	Middle school	0.274***	0.063	18.884	0.000	1.315
	High school and above	0.271***	0.055	24.247	0.000	1.312
General Health Status	Good (ref.)					
	Fair	-1.095***	0.044	615.875	0.000	0.335
	Poor	-2.406***	0.046	2701.864	0.000	0.090
Occupation	No (ref.)					
	Yes	0.906***	0.095	90.981	0.000	2.2473
Household Annual Income	Below 10 lakh (ref.)					
	10-50 lakh	0.109***	0.037	8.753	0.003	1.115
	Above 50 lakh	0.188***	0.052	12.946	0.000	1.207
Engaging in Any Social Activities	No (ref.)					
	Yes	1.064***	0.043	601.158	0.000	2.898

Note: ***, **, * represent 1 percent, 5 percent and 10 percent level of significance. Source: 2019 Myanmar Inter-censal Survey