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Influence of Gender Difference on the Factors Associated with Successful Aging: The Case of Sri Lanka

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Abstract: Gender difference is a socio-culturally, economically and politically constructed ideology that has heavily based on time-space factors. Developing countries like Sri Lanka still face many challenges to address issues creating based on gender differences, since policy makers and schoolers still did not pay enough attention to the reviewing roots of the questions that arising on gender differences. Considering this knowledge gap, this research aims to study on the 'influence of gender difference on the factors associated with successful ageing in the Sri Lankan context'. Main research question of the study is whether gender gaps exist in selected variables that represent social, economic and health aspects of successful ageing. A Grama Niladhari (Rural Officer) Division in Matara Municipal Area was selected as a study area of the research. Mixed research methodology has been applied to investigate the main issue of the research and representative sample of 48 elderly individuals aged 60 years and above have been randomly selected for the deep interviews to collect primary data of the research. As data analyzing methods, statistical techniques such as Simple Logistic Model and Multivariate Logistic Model have been used. The factors that had significant influence on the successful aging were Exposure to Diseases, Number of Sons and Current Age. Although we found little evidence that gender is a strong predictor of successful aging, we can predict, based on several variables that the proportion of successfully aging males did not differ significantly from that of successfully aging females. As the successful elderly are expected to have a positive vision of the future and the capacity to accept changes, interdisciplinary studies are needed to assess the influence of different variables on successful ageing.

Keyword: Gender Difference; Successful Ageing; Matara Municipal Area; Sri Lanka.

1.0 Introduction

Most developed countries have accepted the chronological age of 65 years as a definition of 'elderly' or older person, but like many westernized concepts, this does not adapt well to the developing countries. At the moment, there is no United Nations standard numerical criterion for ageing, but the UN agreed the cutoff is 60 years to refer to the older population in a country (World Health Organization, 2020). The reason for taking 60 years as the cut-off age is that, the retirement age is considered to be between 55 - 60 years in many countries.

In Sri Lanka in 2012, there were 2,524,570 people (12.4%) living above the age of 60 years. Between 1981 and 2012, the proportion of population aged 60 years and above, has increased from 6.6 % to 12.4 % (Perera, 2017). The proportion of elderly population in Sri Lanka which is higher than many South Asian countries, is a relatively large elderly population for a developing country. As the Sri Lanka is gradually becoming an older society, the interest on successful ageing has also increased. Although previous studies have examined various determinants of successful ageing, such as socioeconomic status, the gender difference in successful ageing has been neglected. This study, therefore, has focused on the investigation of the influence of gender difference on the factors affecting successful ageing among elderly men and women. The main objective of the present study was to identify the influence of gender difference on the factors associated with successful aging among elderly people living in Matara Municipal Council Area. The study area is considered as semi urban society, characterized by high life-expectancy.

2.0 Theoretical Framework

2.1 John W. Rowe and Robert L. Kahn's Model

Rowe and Kahn in 1997, who have introduced this model, have defined successful aging as "including three main components: low probability of disease and disease-related disability, high cognitive and physical functional capacity, and active engagement with life" (Rowe, John W. and Robert L Kahn 1997). Recently, they have expanded their model to include maintenance of physical and cognitive functions and engagement in social and productive activities (Crowther et al, 2002). More recently, "successful ageing" has been defined as having high levels of physical and social functioning. Physical functioning includes having no difficulties with activities of daily living (ADL). Social functioning is defined as participation in at least one of the following social activities: paid work, religious gatherings or volunteer service (Park et al., 2009). It is thought that successful ageing is determined by certain factors such as genetics, environment and lifestyle (Gureje et al., 2014).

However, there is no clear selection of key factors that would explain the phenomenon. In the present study, we decided to examine three broad categories of factors which would reasonably explain the combination of issues introduced by Rowe and Kahn, namely the low probability of disease and of deficiencies related to diseases, maintenance or strengthening of physical and cognitive functions and full engagement in life, including productive activities and interpersonal relationships. The complete categorization of factors of the present study will be discussed in the methodology.

2.2 National Trends of Elderly Population

The United Nations observes that industrialization, urbanization and technological revolution have brought about radical social changes, which have weakened the family support system in the society. In these circumstances, the aging population is becoming a challenge in many Asian societies, including Sri Lanka. A comparison of aging experience in the developed countries with that of Sri Lanka reveals that aging in Sri Lanka is occurring in parallel to a relatively lower level of economic development. A favorable combination of decreasing fertility and mortality, and increasing international migration has contributed to an age structural transition which has resulted in a significant increase of the proportion of elderly population (United Nations, 2010). The international labor migration, largely concentrated among young adult working age groups, has increased during the last three decades, reducing the proportion of the working age population in the country. Because of the increase in labour migration, the proportion of the elderly in the population has increased

Based on this migration pattern and the trends in mortality and fertility, the proportion of the population aged 60 and over is projected to increase by nearly 36 % from 9.2 % in 2001 to 12.5 % in 2011. By the year 2041, about a quarter (24.8 %) of the Sri Lankan population will

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be in the 60 and above age group (United Nations, 2010). According to the estimates for the period of 2010 to 2041, the Sri Lanka's population will increase by about 9 % from 20 to 22 million. During the same period, the elderly population (60 and above) will increase from 2.5 million in 2010 to 5.3 million in 2041, a doubling of the elderly population (100% increase) (United Nations, 2010).

According to the findings of another study on the elderly in Sri Lanka that was published by the Overseas Development Institute (ODI) in the United Kingdom in 2004, Sri Lanka's population aged 60 years and older will increase to 18 per cent by 2020 and to 27 per cent by 2040. The ODI study indicates that by 2025, Sri Lanka will have "the third oldest population in Asia and the largest share of elderly in the world relative to its income status" (Research Directorate, Immigration and Refugee Board of Canada, 2005).

The ODI study also found that the incidence of poverty among the elderly in Sri Lanka is less than the national average, largely due to the fact that the elderly people predominantly reside in multiple-person households, with multiple income sources, and many remain economically active in later life". About 30 per cent of retirement income for the elderly comes from transfers from the extended family. Information presented during an address at the Second World Assembly on Ageing in 2002, emphasized that the majority of Sri Lanka's elderly people lived in rural areas where the extended family was the main source of support. In contrast to the situation, most of the elderly in urban areas lived alone and faced problems stemming from high cost of living (Research Directorate, Immigration and Refugee Board of Canada, 2005).

A paper prepared in 2003 by the South Asian Network of Economic Research Institutes provided the following figures on sources of economic support for the elderly in Sri Lanka in 2001: 5.7 per cent of it came from ongoing gainful employment, 34 per cent from pension, and 39.3 per cent from support from one's children (Research Directorate, Immigration and Refugee Board of Canada, 2005).

Another aspect of ageing in Sri Lanka is that the life expectancy at birth for male and female has reported as 72 and 79 years respectively and female often live six years longer than male counterparts in 2012. In 2012, females accounted for about 56 % of total aged population in Sri Lanka but for the oldest-old group (80 or over), this proportion was 61 %. There were 94 males for every 100 females for the total population (Perera, 2017).

2.3 Changing situation of elderly population

The unprecedented growth of the older population, both of absolute numbers and its share in the total population, is a striking feature of the Sri Lanka's demographic pattern. The societal values in Sri Lanka have stressed the responsibility in the care of aging parents and relatives. However, there is considerable evidence to show that the economic and social support and care of the older persons are weakened in Sri Lanka due to the changes of home based family care, changing family system and changing life style by engaging activity pattern of youths (Siddhisena, 2014).

There is an increasing demand for institutional support by the older persons. Various reasons have prompted the elderly to make the decision to move out of the family kinship network and seek institutional support. The family and society consider that older persons are not always a liability but are an asset. Therefore, new policy options and necessary remedies will be needed to overcome the confronting issues facing older people and for them to be a productive and healthier group in future in the Sri Lankan society. The change in age structure and an increasing number of old-age population would result in a significant shrinking of the support base for the ageing population in Sri Lanka. In 1981 there were on average seven persons (age 20-59 years) to provide support for one older person and in 2012 the number dropped to four persons (Siddhisena, 2014).

In 2012, there were 2,496,038 older persons (99 %) lived in households while 24,535 older persons (1 %) were institutionalized (elder homes and other institutions) in Sri Lanka. Most of older persons live with the family. The numbers of older parents who live with their children were 437,000 (17.5 %) while there were 13,081 older persons as domestic employees. More than half of older persons (55.6 %) function as the head of household. In 2012, out of 2,520,573 older populations, 548,776 persons had experienced difficulty in seeing (21.8 %), 284,285 persons had experienced difficulty in hearing (11.3 %), 488,209 persons had experienced difficulty in walking (19.4 %) and 208,657 persons (or 8.3 %) had experienced difficulty related to cognition. Over half of older persons had physical or mental impairments and about one fifth had difficulty in seeing and walking. The highest female functional difficulties were observed from the Urban sector (62.1 %) while the highest male functional difficulties were reported from the Estate sector (43.6 %) (Perera, 2017).

3.0 Methodology

Mixed research methodology was applied as the main approach of the research while the following research design was implemented in data collection and analysis

3.1 Sample and Interviews

Data for this study were obtained from a representative sample of 48 elderly individuals aged 60 years and above. The respondents were interviewed face-to-face by a trained interviewer. Walgama Grama Niladhari Division in the Matara Municipal area was chosen for the data collection. A random sample of households was used to select elderly persons aged 60 years and over living in those households. Sample consisted of 31 female and 17 male elderly people. All participants were informed the nature of the study and consented for the participation. Structured interviews were carried out by the interviewer and the interviews were conducted at their place present residence.

3.2 Factors influencing successful ageing

Data for this study Factors influencing successful ageing Three broad categories of factors were identified as affecting the successful ageing as given below. Under each broad category, several specific variables were also considered.

Social factors:
(1) Current age, (2) Level of education, (3) Marital status, (4) Place of residence, (5) Number of daughters, (6) Number of sons, (7) Involvement of religious work, and (8) Support of household members.

Economic factors:
(1) Last employment, (2) Monthly income, (3) Monthly expenditure (4) Employment of caretaker (5) Employment of son and (6) Employment of Daughter.

Health factors:
(1) Hearing ability, (2) Vision ability, (3) Memory (4) Mental Health, (5) Diseases (6) Daily Work Capability (7) Food pattern, and (8) Medical treatments.

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3.3 Data Analysis: Statistical Methods

The Gender (Male and Female) was selected as the dependent variable of this model mainly due to the fact that the life expectancy is higher among females than males. For the period of 2011-2013, the life expectancy is 78.6 for females and 72 years for males (Dept. of Census & Statistics, Sri Lanka 2015). The dichotomy variable one was assigned as male and dichotomy variable two was assigned for female. Male is considered as the reference variable in Simple logistic Model for the performance of female (Hosmer & Lemeshow, 2004).

Simple Logistic Model formula can be expressed as mentioned below for first stage of statistical analysis.

$$Y = Logit(p) = In[p/(1-p)]$$

$$= B_0 + B_1 N_1 \cdots\cdots (1)$$

Where p is the probability that the dependent variable (Y) is 1, p (1-p) is the so called Odds or likelihood ratio, B_0 is the intercept, and B_1 is coefficients, which measure the contribution of the independent single factor which listed below in figure 1 to the variations in Y.

Table 1: Category of factors, variable codes, names and types for Simple Logistic Model

Category of factors	Variable Code	Variable Name	Variable Type
	CAG	Current age	Scale
	LED	Level of education	Scale
Social factors	MAS	Marital status	Dichotomy
	PRE	Place of residence	Dichotomy
	NOD	Number of daughters	Scale
	NOS	Number of sons	Scale
	MIN	Monthly income	Scale
Economic factors	MEX	Monthly expenditure	Scale
	CEM	Employment of caretaker	Dichotomy
	SEM	Employment of son	Dichotomy
	DEM	Employment of Daughter	Dichotomy
	HEA	Hearing ability	Dichotomy
	VIA	Vision ability	Dichotomy
Health factors	MEM	Memory	Dichotomy
	MEH	Mental Health	Dichotomy
	DIS	Diseases	Dichotomy
	DWC	Daily Work Capability	Dichotomy
	FOP	Food pattern	Dichotomy
	MET	Medical treatments.	Dichotomy

Multivariate Logistic Model was applied for significant variables as analysis of second stage of study. Hence, all 5 significant variables of first stage of simple logistic model were again applied to the Multivariate logistic model which covering socio, economic and health aspects. The model can be expressed as a Multivariate Logistic Regression Equation as follows:

$$Y = Logit(p) = In[p/(1-p)]$$

$$= B_0 + B_1 CAG + B_2 PRE + B_3 NOS + B_4 MIN + B_5 DIS \cdots\cdots (2)$$

Where p is the probability that the dependent variable (Y) is 1, p (1-p) is the so called Odds or likelihood ratio, B_0 is the intercept, and $B_1 + B_2 .... B_5$ are coefficients, which measure the contribution of the independent factors listed below to the variations in Y.

CAG	=	Current Age
PRE	=	Present Residence Place
NOS	=	Number of Sons
MIN	=	Monthly Income
DIS	=	Diseases

4.0 Results

The analysis was performed to identify whether there is any difference between male elderly people and female elderly people with regard to the selected variables which influence on the successful ageing. All data were initially stored in an Excel spreadsheet and later transferred to and analyzed using the SPSS program, version 22. A single variable analysis was carried out for each specific category, using the gender (male or female) as dependant variable. In accordance with this analysis, the elderly people were classified into two groups: male elderly and female elderly.

Most of the 48 elderly people interviewed were female 37 (64.6%). Regarding age brackets, 58.3% were between 60 and 69 years of age, 27.1% were between 70 and 79 and 14.6% were older than 80 years and over. Mean age was 69.7 years (sd = 1.13). Of those 48, 16.7% had never gone to school and 33.3% had less than 5 years of schooling. Furthermore, 37.5% had secondary education up to Grade 11. 4.2% were married and 81.3% were widows/widowers. Another 4.2% were divorced and 10.4% were unmarried. Majority are widows indicating

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the death of husband because of their life expectancy is lower than wives. Mean number of daughters was 1.81 and mean number of daughters was slightly higher (1.96).

In order to identify the probable determining factors for successful aging, we compared the difference between the proportions of females and males using both simple logistic model and multivariate logistic model. Initially, simple logistic model was applied. The independent variables under investigation were as mentioned above. In the final multivariate logistic model, we considered only the variables associated with successful aging that presented a p value less than or equal to 0.05. The strength of the correlations between the variables in the simple and multivariate analyses was determined by odds ratio, and their confidence intervals were calculated using Wald method. The statistical analysis was repeated using the logistic regression technique after the sample had been separated by gender.

Table 2 shows the analysis of the comparison between the two groups of people (male and female) regarding the several variables of social factors under study using simple logistic model. Successful female elderly people presented lower means regarding current age, place of residence and number of sons when compared to elderly male people. Table 1 also provides the regression coefficient (B), the Wald statistic (to test the statistical significance), and the important Odds ratio (Exp (B)) for each variable category. Looking at the results of Social factor variables, the three highly significant variables can be found: Number of sons (Wald = 7.68, P = 0.006), Current age (Wald = 4.611, P = 0.032) and Place of Residence (Wald =4.303, P = 0.000). These variables are significant as well as having positive or negative relation. The (Exp (B)) or (odds ratio) at 95% CI indicates that elderly female with a good score in the Number of Sons which is 2.174 times ratio likely to make it good health than male. The variable of Current Age is highly significant which indicates as having a positive relationship. However, Place of residence has negative relationship which indicates the odd ratio .558. Only three variables are significant out of six variables in the category of social factors after run the simple logistic model separately.

Table 2: Social factors affecting the successful ageing

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Current age	.103	.048	4.611	1	.032	1.108
Level of education	-.518	.322	2.588	1	.108	.596
Marital status	-.893	.486	3.384	1	.066	.409
Present place of residence	-.583	.281	4.303	1	.038	.558
Number of sons	.777	.280	7.680	1	.006	2.174
Number of daughters	.473	.268	3.128	1	.077	1.606

Table 3 shows the analysis of the comparison between the two groups of people (male and female) regarding several variables of economic factors by running independently using simple logistic model. The female elderly people presented lower means regarding monthly income, when compared to elderly male people. Table 2 also provides the regression coefficient (B), the Wald statistic (to test the statistical significance), and the important Odds ratio (Exp (B)) for each variable category. Looking at the results of above economic factor variables, monthly income can be identified as the highly significant variable, (Wald = 3.871, P = 0.049). This variable is significant as well shows negative effect when compared with male elderly. The (Exp (B)) or (odds ratio) at 95% CI indicates the value as at .912.

Table 3: Economic factors affecting the successful ageing

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Monthly income	-.092	.047	3.871	1	.049	.912
Monthly expenditure for medicine	.304	.193	2.496	1	.114	1.356
Employment of caretaker(child)	.537	.632	.722	1	.395	1.711
Employment of son	.699	.641	1.189	1	.276	2.012
Employment of daughter	-.208	.607	.117	1	.732	.813

Table 4 shows the analysis of the comparison between the two groups of people (male and female) regarding several variables of health factors under study using simple logistic model. Successful female elderly people presented lower means regarding diseases, when compared to elderly male people. Table 3 also provides the regression coefficient (B), the Wald statistic (to test the statistical significance), and the important Odds ratio (Exp (B)) for each variable category. Looking at the results of above health factor variables, diseases can be found as highly significant variable, (Wald = 4.852, P = 0.028). This variable is significant as well as is highly positive when compared with male elderly. The (Exp (B)) or (odds ratio) at 95% CI indicate the value stands at 4.107.

Table 4: Health factors affecting the successful ageing

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Diseases	1.413	.641	4.852	1	.028	4.107
Food pattern	.241	.619	.152	1	.697	1.273
Mental Health	.943	.739	1.628	1	.202	2.567
Medical treatments	-.449	.431	1.090	1	.297	.638
Daily work capability	-1.345	1.127	1.426	1	.232	.260
Hearing ability	-.799	.743	1.154	1	.283	.450
Vision ability	-.943	.739	1.628	1	.202	.390
Memory	-1.273	.845	2.269	1	.132	.280

Table 5 shows the overall analysis of the comparison between the two groups of people (male and female) by using Multivariate Logistic model for the all significant variables at the first stage of analysis for the all three factors: social, economic and health under study. Successful female elderly people presented lower means regarding current age, number of sons and diseases when compared with elderly male people. Table 5 also indicates the all significant variables in first stage which were run with simple logistic model. Five variables of Table 5 were run with multivariate logistic model to compare with the most significant variables. Accordingly, three variables are significant. Table 5 provides the regression coefficient (B), the Wald statistic (to test the statistical significance), and the important Odds ratio (Exp (B)) for each variable category. Looking at the results of above all variables, the three highly significant variables are, Diseases (Wald = 4..686, P = 0.030),

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Number of Sons (Wald = 3.763, P = 0.050) and Current Age (Wald = 3.561, P = 0.050). These variables are significant as well are positively related to female elderly. The (Exp (B)) or (odds ratio) at 95% CI indicates that female elderly are higher than male elderly in all three significant variables

Table 5: Multivariate Logistic Model for the all Significant Variables at first sate

Step 1ᵃ	B	S.E.	Wald	df	Sig.	Exp(B)
Current age	.128	.068	3.561	1	.050	1.137
Place of residence	1.131	.889	1.620	1	.203	3.099
Number of sons	.608	.313	3.763	1	.050	1.836
Monthly income	-.078	.059	1.744	1	.187	.925
Diseases	1.955	.903	4.686	1	.030	7.067
Constant	-11.207	5.395	4.314	1	.038	.000

Variable(s) entered on step 1: Current age, Place of residence, Number of sons, Monthly income, Diseases.

5.0 Conclusion

There was a predominance of females in the study sample. The educational level of most of the sample was lower than or equal to eight years of schooling. The predominant age bracket was from 60 to 69 years. Majority of the elderly were widows/widowers. These results confirmed a tendency shown in other elderly studies. We also confirmed that the proportion of males in the study sample of elderly is lower possibly due to the higher life expectancy of female elderly. Although this sample is smaller, it can be considered as representative of the elderly population in a semi urban area. The sample in the study was sufficient to guarantee the performance of statistical analysis, as well as the interpretation.

In the present study, we used several variables to measure the elderly peoples' experience regarding their social, economic and health status which were directed at measuring the successful ageing. Data were collected through common tools, questionnaire, observations and discussions as already available in the literature. In order to analyze successful aging, we chose to perform three broad categories of variables using two models for the assessment of successful ageing validated for the elderly people. The factors that had significant influence on the successful aging of female than male were in Number of Sons (Wald = 3.763, P = 0.050) and Current Age (Wald = 3.561, P = 0.050). Exposure to Diseases were grater in female than man by indicating following values (Wald = 4.686, P = 0.030).

The results of the present study were similar to a study carried out with elderly urban dwellers in Brazil. However, various studies have presented results that are not in agreement with those obtained in the present study. Marital status was not found to correlate with successful aging. This result is in agreement with those of other studies. Participation in religious activities was assessed by the study. Despite being correlated with successful aging, this variable was not enough to influence on successful aging, from a social point of view.

Although we found little evidence that gender is a strong predictor of successful aging, we can predict, based on several variables that the proportion of successfully aging males did not differ significantly from that of successfully aging females. Studies on gender-based health differences in industrialized societies have shown that, although females live longer than males, they report higher morbidity and psychological problems and use health services more often (Moraes, 2005).

The successful aging is a multidimensional construct that is subject to various interpretations. As a consequence, we would like to emphasize the need to take special precautions in order to avoid artificial interpretations on this theme. Despite the similarities, we need to be careful in drawing comparisons with the results of other studies, in which different variables may have been used to assess the same relationship.

Our study sample was semi-urban and small, and the information collected was subjective and therefore, the responses of the participants might have expressed their desired, rather than the actual, situation of the variables. The successful elderly are expected to have a positive vision of the future and the capacity to accept changes. Interdisciplinary studies, therefore, are needed. We suggest future research on this theme, in which questionings regarding more specific variables should be included.

Conflicts of Interest: There is no conflict of interest in this study.

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