Self-rated health and its determinants among older people living in the rural community in Sri Lanka

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Abstract: *Sri Lanka is a developing country that experience rapid ageing, but studies on assessment of overall health status among the older people are limited. The aim of this study was to assess self-rated health (SRH) and to determine its association with socio-demographic variables, activities of daily living and chronic diseases among older Sri Lankan living in the rural community. This study was based on data collected from 356 older people aged 60 and above who participated in the quality of life survey conducted in Thalawa Divisional Secretariat Division, Anuradhapura District in 2014. SRH was assessed by a single global question "How would you rate your current health?" on a five point scale. Pearson's Chi-square test and binary logistic regression were used to examine the determinants. The majority of the respondents reported "poor/very poor" SRH compared to "good/excellent" SRH. The presence of chronic kidney disease was the strongest determinant of poor SRH. No formal education, unemployment, poor income, presence of hypertension, arthritis, neurologic problems, asthma and cataract/vision problems were other significant determinants of poor SRH. The findings suggest the need for effective health promotion strategies to improve overall health status among older Sri Lankan. The emphasis ought to be on the prevention and management of chronic diseases.*
Key words: *Determinants, Older people, Self-rated health, Sri Lanka*

I. Background

In recent decades, most of the developed and developing countries are experiencing demographic transition. Thus, population ageing is a greatest challenge for many countries. This phenomenon has major economic, political and social consequences [1] and has a significant impact on health status, physical ability and quality of life among older people [2]. Deterioration of health is one of the major negative consequences of ageing and literature has shown that health declines with ageing [3, 4]. Hence, older people would require more health and nursing care compared to the other age groups. Therefore, examining the overall health status among this population is necessary in order to improve their health and well-being and to plan relevant health policies. Internationally, overall health status among older population is well-established specifically in western countries. There are limited studies related to overall health status among older people in developing countries. Sri Lanka is a developing country that experiences rapid ageing, therefore, there is a need to assess the overall health status among older people in Sri Lanka.

SRH is a measurement that represents the general health perception of people and indicates overall evaluation in various aspects of health [5]. Ocampo [6] states that SRH is a subjective measurement integrating the biological, mental, social, and functional aspects of an individual's health. Moreover, it is an established predictor leading to mortality, morbidity and disability [6-11], health care services utilization [7, 8, 12] and quality of life [7, 13, 14]. According to Ocampo [6], SRH is influenced by the physical function, presence of disease, existence of disabilities, functional limitations, rate of ageing, and may be moderated by demographics, social and mental determinants. Therefore, when planning health programmes, it is essential to understand the factors associated with health status. With unprecedented population ageing, it has become a focus in health studies among the elderly population worldwide. This health indicator is widely measured by a single global question that ask people to rate their overall health on a Likert scale [7, 15]. It has been used in the development and implementation of programmes of health promotion and disease prevention [6] and in public health policies [7].

Nationally, there is limited evidence of overall health status and its associated factors among older people. In a national study, Ostbye et al [3] investigated thirteen health aspects including SRH and the relationship between SRH with other dimensions in a representative sample of older people from 13 districts of Sri Lanka. They found that older people reported poor SRH across the sub-age groups and absence of chronic diseases, independence in activities of daily living (ADL) and instrumental ADL, freedom from stress and worry, and absence of depression were associated with positive SRH. Internationally, SRH of older population is well-established [10, 16-19] and association between SRH with socio-demographic variables [4, 7, 16, 17, 19-23], chronic diseases [10, 16, 24, 25] and functional abilities [17, 19, 24] has been widely examined.

The populace of Sri Lanka is grouped into three sectors namely urban, rural and estate, with the majority of the population in the rural sector (77.4%) [26]. Comparatively, people of rural areas in the country face more difficulties including health, transport and other infrastructural facilities than urban areas. But, health status among older people in rural Sri Lanka is not widely examined and there are no reported studies that examined SRH and its determinants. It is essential to examine overall health status among older people in rural parts that would inform relevant stakeholders in planning interventions and policies. Given the paucity of information, the aim of this study was to assess SRH and to determine its association with socio-demographic variables, ADL and chronic diseases among older Sri Lankan living in the rural community.

II.   Methods

In this secondary analysis, data is obtained from the quality of life survey, a cross-sectional community based study conducted from April to July 2014 in Thalawa Divisional Secretariat Division (sub-administrative division), Anuradhapura District, Sri Lanka. The methodology has been described elsewhere in detail [13]. A two-stage simple random sample of 356 Sinhalese older people aged 60 and over who are living in the community were interviewed using a structured questionnaire. The original questionnaire consisted of five sections namely Section 1-socio-demographic questionnaire; Section 2- self-reported chronic medical problems; Section 3-functional status; Section 4 - SRH; and Section 5- quality of life. This study was approved by the Research and Ethics Committee, Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak, Malaysia and the Ethical Review Committee, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka. Written informed consent was signed by all the participants prior to data collection.

SRH, the outcome variable in this study, was measured using the single global question "How would you rate your current health?" on a five point scale as very poor, poor, fair, good and excellent. A higher score indicated good SRH. For the independent variables, socio-demographic factors (age, gender, marital status, educational level, living arrangement, employment status and monthly family income), presence of self-reported chronic medical problems based on eight diseases common in old age (hypertension, cardiac diseases, diabetes mellitus, arthritis, neurologic problems, asthma, cataract/vision problems and chronic kidney diseases), and disability in ADL: bathing, dressing, toileting, transferring, continence, and feeding, which were originally included in the Katz ADL Index [27]were examined. ADL disability for this study was defined as requiring assistance in any ADL tested.

Statistical Package for Social Sciences Version 20 for Windows was used in the data analysis. For this study, 356 responses were included and 20 missing values of monthly family income were replaced with mean monthly family income. Socio-demographic data, presence of chronic medical problems, ADL disability and SRH were described using descriptive statistics. Bivariate relationship between independent variables and SRH categories were performed using Pearson's Chi-square test. Determinants of SRH were examined by binary logistic regression analysis. Significantly associated independent variables in bivariate analyses were simultaneously entered into a logistic regression model with SRH as the dependent variable. For multivariate analyses, a dichotomous SRH measure was created and coded with 1' if response was, 'poor' or 'very poor' (poor SRH category) and '0' if response was 'excellent', 'good' or 'fair' (good SRH category). All independent variables were binary coded. The Hosmer-Lemeshow statistic was examined to assess the fit of the model. Alpha level of significance was set at < 0.05.

III.   Results

The total sample consisted of 356 older people aged 60 and over (51.2% of males and 48.8% of females). Table 1 shows the descriptive statistics for socio-demographic data, presence of chronic medical problems and ADL disability among the respondents.

Table 1: Socio-demographic characteristics, chronic medical problems and ADL disability among the respondents (n = 356)

Characteristics	n	%	(Mean±*SD*)
Age			68.15±6.901
60 -69 years	224	62.9	
70-79 years	105	29.5	
80 years and above	27	7.6	
Marital status			
Married	225	63.2	
Never married	7	2.0	
Divorced or separated	4	1.1	
Widowed	120	33.7	

Education			
No formal education	41	11.5	
Primary education	126	35.4	
Secondary education	181	50.8	
Tertiary education	8	2.2	
Living arrangement			
Living alone	28	7.9	
Living with spouse and/or children	307	86.2	
Living with others	21	5.9	
Employment status			
Presently employed	102	28.7	
Presently non-employed	254	71.3	
Monthly family income			20645±17422
Below the national poverty line	142	39.9	
Above the national poverty line	214	60.1	
Presence of chronic medical problems			
None	76	21.3	
One disease	114	32.0	
Two –three diseases	136	38.2	
Four diseases and more	30	8.4	
Hypertension			
Present	112	31.5	
Not present	244	68.5	
Heart diseases			
Present	43	12.1	
Not present	313	87.9	
Diabetic mellitus			
Present	53	14.9	
Not present	303	85.1	
Arthritis			
Present	59	16.6	
Not present	297	83.4	
Neurological diseases			
Present	45	12.6	
Not present	311	87.4	
Asthma			
Present	39	11.0	
Not present	317	89.0	
Cataract and vision problems			
Present	194	54.5	
Not present	162	45.5	
Chronic kidney diseases			
Present	20	5.6	
Not present	336	94.4	
ADL disability			
Present	33	9.3	
Not present	323	90.7	

When considering SRH, the majority of the respondents reported "fair" (34.6%) or "poor" (33.4%) SRH. Only few respondents reported excellent SRH status (3.9%). The very poor SRH was observed among 7.3% of the respondents. Overall, high rating of poor/very poor SRH (40.7%) was reported compared to excellent/very good SRH (24.7%) (Table 2).

Table 2: Prevalence of SRH among the respondents (n = 356)

SRH category	n	%
Excellent	14	3.9
Good	74	20.8
Fair	123	34.6
Poor	119	33.4
Very poor	26	7.3

Chi-Square analysis showed that age (x^2=14.534, p = 0.001), gender (x^2=12.738, p = <0.001), marital status (x^2=13.859, p = <0.001) education (x^2=25.630, p = <0.001), employment status (x^2=13.754, p = <0.001), monthly family income (x^2=7.179, p = 0.007), number of chronic medical problems (x^2=55.521, p = <0.001), hypertension (x^2=40.460, p = <0.001), arthritis (x^2=21.416, p = <0.001), neurological disorders (x^2=19.695, p = <0.001), asthma (x^2=6.039, p = 0.014), cataract/vision problems (x^2=24.786, p =<0.001), chronic kidney diseases (x^2=13.536, p = <0.001), and ADL disability (x^2=14.485, p = <0.001) were significantly associated with SRH (Table 3).

Table 3: Pearson's Chi-square test for association between independent variable and SRH among the respondents (n = 356)

Variable	Good SRH n=211 (%)	Poor SRH n=145 (%)	X2	df	P value
Age			14.534	2	0.001
60-69 years old	149 (66.5)	75(33.5)			
70-79 years old	52 (49.5)	53(50.5)			
80 years and above	10(37)	17 (63)			
Gender			12.738	1	<0.001
Male	125 (68.3)	58(31.7)			
Female	86 (49.7)	87 (50.3)			
Marital status					
Married	150(66.7)	75 (33.3)	13.859	1	<0.001
Others	61(46.6)	70 (53.4)			
Education			25.630	2	<0.001
No formal education	13(31.7)	28(68.3)			
Primary education	65 (51.6)	61 (48.4)			
Secondary education and above	133 (70.4)	56 (29.6)			
Living arrangement			1.358	2	0.507
Living alone	16 (57.1)	12 (42.9)			
Living with spouse/children	185 (60.3)	122 (39.7)			
Living with others	10 (47.6)	11 (52.4)			
Employment status			13.754	1	<0.001
Presently employed	76 (74.5)	26 (25.5)			
Presently non-employed	135 (53.1)	119 (46.9)			
Family income			7.179	1	0.007
Below the poverty line	72 (50.7)	70 (49.3)			
Above the poverty line	139 (65)	75 (35)			
Number of chronic medical problems			55.521	2	<0.001
No disease	64 (84.2)	12 (15.8)			
One to two diseases	126 (62.7)	75 (37.3)			
Three diseases and above	21 (26.6)	58 (73.4)			
Hypertension			40.460	1	<0.001
Present	39 (34.8)	73 (65.2)			
Not present	172 (70.5)	72 (29.5)			
Heart diseases			2.205	1	0.138
Present	21 (48.8)	22 (51.2)			
Not present	190 (60.7)	123 (39.3)			
Diabetic mellitus			.016	1	0.900
Present	31 (58.5)	22 (41.5)			
Not present	180 (59.4)	123 (40.6)			
Arthritis			21.461	1	<0.001
Present	19 (32.2)	40 (67.8)			
Not present	192 (64.6)	105 (35.4)			
Neurological diseases			19.695	1	<0.001
Present	13 (28.9)	32 (71.1)			
Not present	198 (63.7)	113 (36.3)			
Asthma			6.039	1	0.014
Present	16 (41)	23 (59)			
Not present	195 (61.5)	122 (38.5)			
Cataract and vision problems			24.786	1	<0.001
Present	92 (47.4)	102 (52.6)			
Not present	119 (73.5)	43 (26.5)			
Chronic kidney diseases			13.536	1	<0.001
Present	4 (20)	16 (80)			
Not present	207 (61.6)	129 (38.4)			
ADL disability			18.485	1	<0.001
Present	8 (24.2)	25 (75.8)			
Not present	203 (62.8)	120 (37.2)			

Binary logistic regression analysis showed that education (OR = 2.657, 95% CI: 1.151 - 6.135), employment status (OR = 2.013, 95% CI: 1.042 - 3.887), family income (OR = 2.068, 95% CI: 1.195-3.577), hypertension (OR = 2.617, 95% CI: 1.434 - 4.774), arthritis (OR = 4.225, 95% CI: 1.981 - 9.014), neurologic problems (OR = 5.147, 95% CI: 2.074 - 12.774), asthma (OR = 2.753, 95% CI: 1.117 - 6.782), cataract/vision problems (OR = 4.569, 95% CI: 2.217 - 9.419) and chronic kidney diseases (OR = 10.804, 95% CI: 2.582 - 45.213) were the significant determinants of SRH among older people (Table 4).

Table 4: Multivariate analyses: Determinants for SRH among the respondents (n = 356)

Covariate	B	SE	Wald	df	P value	OR (95% CI)
Age	0.247	0.296	0.696	1	0.404	1.281 (0.716 - 2.290)
Gender	0.203	0.327	0.386	1	0.534	1.226 (0.645 - 2.327)
Marital status	0.471	0.322	2.142	1	0.143	1.602 (.852 - 3.011)
Education	0.977	0.427	5.240	1	0.022	2.657 (1.151 - 6.135)
Employment status	0.699	0.336	4.335	1	0.037	2.013 (1.042 - 3.887)
Family income	0.726	0.280	6.748	1	0.009	2.068 (1.195 - 3.577)
Number of chronic medical problems	0.769	0.519	2.198	1	0.138	2.158 (.781 - 5.966)
Hypertension	0.962	0.307	9.832	1	0.002	2.617 (1.434 - 4.774)
Arthritis	1.442	0.386	13.923	1	<0.001	4.229 (1.983 - 9.018)
Neurological diseases	1.638	0.464	12.482	1	<0.001	5.147 (2.074 -12.774)
Asthma	1.013	0.460	4.846	1	0.028	2.753 (1.117 -6.782)
Cataract and vision problems	1.519	0.369	16.946	1	<0.001	4.569 (2.217 - 9.419)
Chronic kidney diseases	2.380	0.730	10.618	1	0.001	10.804 (2.582 -45.213)
ADL disability	-.660	0.500	1.742	1	0.187	0.517 (0.194 - 1.377)
Constant	-.081	0.758	16.523	1	<0.001	.046
Hosmer and Lemeshow test					0.133	

P Value = 0.05, Score test (x^2 = 136.852, df = 14, P = <0.001), Nagelkerke R^2 Square = 0.431

IV. Discussion

The aim of this study was to examine SRH and its associated factors among older people living in the rural community in Sri Lanka. This study found that the most of the older people living in the community reported poor/very poor SRH compared to good/very good SRH. Higher rating of poor SRH among older people was reported in studies conducted nationally [3] and internationally [16]. Conversely, some studies reported comparatively high rating of good SRH among older people [7, 18, 19]. As SRH is a multi-dimensional construct [6], the findings may vary from country to country and may be led by country specific socio-economic and cultural patterns, pattern of disease prevalence, availability of health services and other facilities as well as the perception of the people. However, the findings of this study raise the need of improving the overall health status among older people living in rural Sri Lanka.

This study found that the chronic kidney disease is the strongest determinant of poor SRH. Older people who presented with chronic kidney diseases were 10.8 times more likely to report poor SRH compared to older people who did not report chronic kidney diseases. Moreover, multivariate analysis showed that presence of hypertension, arthritis, neurologic problems, asthma and cataract/vision problems were other determinants of poor SRH. Hence, our findings indicate that the presence of chronic diseases is a significant indicator related with poor SRH among older people living in the rural community in Sri Lanka. In a national study, Ostbye et al[3]also found that the presence of chronic diseases was significantly associated with SRH. Studies conducted in other countries also found that chronic diseases were significantly associated with SRH among older people. In a Malaysian study, Chan et al [25] found that asthma, arthritis, hypertension, hypercholesterolemia, and heart disease were the significant predictors of poor SRH. Burke et al [24] found that SRH was best predicted by comorbidity in older adults in an Irish population. It is well-established that chronic diseases are significantly associated with increased morbidity and mortality among older population. Browning and Thomas[28] state that chronic illness is one of the main threats to attain good quality of life in old age and is a major burden for older people and their families and carers. According to the Ministry of Health, Sri Lanka [29], non-communicable diseases were the leading cause of hospital deaths in the country. Rannan-Eliya[30] stated that expenditure for non-communicable diseases will continue to increase for chronic diseases in Sri Lanka. Consequently, the findings of our study provide evidence for prevention initiatives and proper management of chronic diseases to minimize the negative impact of chronic disease onolder people who are living in the rural community. Special attention is needed for older people who suffered from chronic kidney diseases as the disease has the greatest predicting value for poor SRH among older people in the selected setting.

Our study found that some socio-demographic variables namely education, employment status and monthly family income were significant determinants of SRH in the older people. Similarly, in a Brazilian study, Caetano et al [23] reported that age, working status and income status were associated with SRH among older people. In a Beirut study, Chemaitelly et al [20]also reported that age and education were associated with SRH among older people. Education, income and employment status are crucial socio-demographic factors when designing any health related intervention and policy. These determinants need to be incorporated in planning interventions and policies in improving health of the older people living in the rural community in Sri Lanka.

V. Conclusion

The findings of this study conclude that most of the older people living in the rural community experience comparatively poor SRH. The presence of chronic kidney disease was the strongest determinant of poor SRH. No formal education, unemployment, poor income, presence of hypertension, arthritis, neurologic problems, asthma and cataract/vision problems were other significant determinants of poor SRH. This study provides important baseline information on SRH of older people living in the rural community in Sri Lanka. The role of public health is essential in improving the health status among older people in rural community. Both illness prevention and health promotion activities are recommended. The proper management of chronic diseases should be a major concern in health policies and interventions to improve health and well-being of older people. Level of education, employment status and income status should be incorporated in the planning of interventions to improve health of the older people. This study examined the association of SRH with few factors. In the future studies, it is essential to examine the relationship between SRH with other known factors including mental health problems, loneliness, social support, and health care behaviors. Longitudinal studies may be helpful to further explore SRH. There are some limitations in this study. The cross-sectional design hampers causality inference. As this study was conducted among older people in the rural community, findings cannot be generalized to all older people in Sri Lanka.

Acknowledgement

References

[1]   United Nation (2013). World Population Ageing 2013. New York: United Nation. Retrieved From http://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf
[2]   Mwanyangala, M. A., Mayombana, C., Urassa, H., Charles, J., Mahutanga, C., Abdullah, S., and Nathan, R. (2010). Health status and quality of life among older adults in rural Tanzania. Global Health Action Supplement, 2, 36-44. 2010. doi: 10.3402/gha. v3i0 .2142
[3]   Ostbye, T., Malhotra, R., and Chan, A. (2009). Thirteen dimensions of health in elderly SriLankans: Results from a National Sri Lanka Aging Survey. Journal of the American Geriatrics Society, 57 (8), 1376–1387. DOI: 10.1111/j.1532-5415.2009.02350.x
[4]   Razzaque, A., Nahar, L., Khanam, M. A., andStreatfield, P. K. (2010). Socio-demographic differentials of adult health indicators in Matlab, Bangladesh: Self-rated health, health state, quality of life and disability level. Global Health Action Supplement 2. DOI: 10.3402/gha.v3i0.4618
[5]   Wilson, I. B., and Cleary, P. D. (1995). Linking Clinical variable with health related QOL: A conceptual model of patient outcomes. The Journal of American Medical Association, 273(1), 59-65
[6]   Ocampo, J. M. (2010). Self-rated health: Importance of use in elderly adults. Colomb Med., 41(3), 275-289
[7]   Darviri, C., Fouka, G., Gnardellis, C., Artemiadis, A. K., Tigani, X., and Alexopoulos, E. C. (2012). Determinants of self-rated health in a representative sample of a rural population: A cross-sectional study in Greece. Int. J. Environ. Res. Public Health, 9, 943-954. DOI:10.3390/ijerph9030943
[8]   Jylha, M. (2009). What is self-rated health and why does it predict mortality? Towards a Unified Conceptual Model. Social Science & Medicine, 69 (3), 307-316. DOI: 10.1016 /j.socscimed.2009.05.013
[9]   Ng, N., Hakimi, M., Santosa, A., Byass, P., Wilopo, S. A., and Wall, S. (2012). Is self-rated health an independent index for mortality among older people in Indonesia? PLoS ONE, 7(4): e35308. doi:10.1371/journal.pone.0035308
[10]   Sun, W., Watanabe, M., Tanimoto, Y., Shibutani, T., Kono, R., Saito, M., Usuda, K. and Kono, K. (2007). Factors associated with good self-rated health of non-disabled elderly living alone in Japan: A cross-sectional study. BMC Public Health, 7:297 doi:10.1186/1471-2458-7-297
[11]   Wong, D.D. Wong, R. P. C., and Caplan, G. A. (2007). Self-rated health in the unwell elderly presenting to the emergency department. Emergency Medicine Australasia 19, 196–202 doi: 10.1111/j.1742-6723.2007.00924.x
[12]   Su, D., Richardson, C., Wen, M., and Pagan, J. A. (2011). Cross-border utilization of health care: Evidence from a population-based study in South Texas. HSR: Health Services Research, 46(3). DOI: 10.1111/j.1475-6773.2010.01220.x
[13]   Rathnayake, S., and Siop, S., 2015. Quality of life and its determinants among older people living in the rural community in Sri Lanka. Indian Journal of Gerontology 29 (2), 131–153.
[14]   Siop, S., Verbrugge, L. M., and Hamid, T. A. T. A. (2008). Disability and quality of life among older Malaysian. Retrieved from. http://paa2008.princeton.edu/papers/80962
[15]   Ferrans, C. E., Zerwic, J. J., Wilbur, J. E., and Larson, J. L. (2005). Conceptual model of health-related quality of life. Journal of Nursing Scholarship, 37 (4), 336-342.
[16]   Borim, F. S. A., Neri, A. L., Francisco, P. M. S. T., and Barros, M. B. de. A. (2014). Dimensions of self-rated health in older adults. Rev SaúdePública, 48 (5), 714-722. DOI:10.1590/S0034-8910.2014048005243
[17]   Giron, P. (2012). Is age associated with self-rated health among older people in spain?.Cent EurJ Public Health, 20 (3): 185-190.
[18]   Arnadottir, S. A., Gunnarsdottir, E., D., Stenlund, H., and Lundin-Olsson, L. (2011). Determinants of self-rated health in old age: A population-based, cross-sectional study using the international classification of functioning. BMC Public Health, 11 (670). Retrieved from http://www.biomedcentral.com/1471-2458/11/670
[19]   Debpuur, C., Welaga, P., Wak, G., and Hodgson, A. (2010). Self-reported health and functional limitations among older people in the Kassena-Nankana District, Ghana. Global Health Action Supplement, 2, 2010, 54-63. DOI: 10.3402/gha.v3i0.2151
[20]   Chemaitelly, H., Kanaan, C., Beydoun, H., Chaaya, M., Kanaan, M., and Sibai, A. M. (2013). The role of gender in the association of social capital, social support, and economic security with self-rated health among older adults in deprived communities in Beirut. Qual Life Res 22, 1371–1379. DOI 10.1007/s11136-012-0273-9
[21]   Kumar, P.and Kumar, A. (2012). Socio-economic status and self-rated health status of the elderly in rural Uttar Pradesh. Indian J. Prev. Soc. Med, 43 (3), 255-260.
[22]   Sudha, S., Rajan, S. I., Mutran, E. J., andSarma, P. S. (2007). Marital status, family ties, and self-rated health among elderly men and women in South India. Journal of Cross Cultural Gerontology, 21(3-4).

[23]   Caetano, S. C., Silva, C. M. F. P., andVettore, M. V. (2013). Gender differences in the association of perceived social support and social network with self-rated health status among older adults: a population-based study in Brazil. BMC Geriatrics, 13:122. Retrieved from http://www.biomedcentral.com/1471-2318/13/122

[24]   Burke, K. E., Schnittger, R., O'Deaab, B., Buckley, V., Wherton, J. P., and Lawlor, B. A. (2012). Factors associated with perceived health in older adult Irish population. Aging & Mental Health, 16 (3), 288–295. http://dx.doi.org/10.1080/13607863.2011.628976

[25]   Chan, Y.Y., Teh, C.H., Lim, K.K., Lim, K.H., Yeo, P.S., Kee, C.C., Omar, M.A., and Ahmad, N.A. (2015). Lifestyle, chronic diseases and self-rated health among Malaysian adults: results from the 2011 National Health and Morbidity Survey (NHMS). BMC Public Health (2015) 15:754. DOI 10.1186/s12889-015-2080-z

[26]   Department of Census and Statistics- Sri Lanka. (2012). Census of Population and Housing-Sri Lanka, 2012. Retrieved December 29, 2014 from http://www.statistics. gov.lk/PopHouSat/CPH2011/index.php?filename=FinalPopulation&gp=Activities&tpl=3

[27]   Katz, S., Downs, T. D., Cash, H. R., andGrotz, R. C. (1963). Progress in development of the index of ADL. The Gerontologist, 20-30.

[28]   Browning. C., & Thomas, S. (2013). Enhancing quality of life in older people. Australian Psychological Society. Retrieved from https://www.psychology.org.qu/Content. aspx? ID=5040

[29]   Ministry of Health-Sri Lanka. (2012). Annual Health Bulletin-Sri Lanka. Colombo: Ministry of Health

[30]   Rannan-Eliya, R. P., 2007. Population ageing and health expenditure: Sri Lanka 2001-2101. Colombo: Institute of Health Policy. Retrieved from http://www.ihp.lk.