



# Impact of perceived social support and physical fitness on quality of life of institutionalized and non-institutionalized older adults in Sri Lanka



Anuradha Wickramasinghe<sup>a</sup>, Madushika Gamage<sup>a</sup>, Mohammad R. Torabi<sup>b</sup>, Bilesha Perera<sup>c,\*</sup>

<sup>a</sup> Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka

<sup>b</sup> School of Public Health – Bloomington, Indiana University, IN 47405, USA

<sup>c</sup> Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka

## ARTICLE INFO

### Keywords:

Quality of Life  
Institutionalized older adults  
non-institutionalized older adults  
Sri Lanka

## ABSTRACT

**Background and aim:** Quality of life (QoL) in old age contributes to enhance active aging. This study aimed to assess and compare QoL and associated factors of institutionalized and non-institutionalized older adults (aged 60+ years) in Southern Sri Lanka.

**Methods:** A total of 160 older adults (80 institutionalized and 80 non-institutionalized) were surveyed. Physical and cognitive skills were measured using Barthel index, and Mini Mental State Examination scales. Nutritional status and perceived social support were measured using Mini Nutritional Assessment and Multidimensional Scale of Perceived Social Support. Descriptive statistics and multiple regression techniques were used in the analysis.

**Results:** The mean age of the institutionalized older adults was higher than that of non-institutionalized older adults (74.9 years versus 72.1 years,  $p < 0.01$ ). About half of the sample consisted of older men (48.8%). Economically under privileged older adults who were unmarried were more likely to become institutionalized. The mean value of the QoL score was higher in non-institutionalized older adults compared to that of institutionalized older adults (63.1 ( $SD = 21.9$ ) versus 49.1 ( $SD = 25.6$ ),  $p < 0.05$ ). Activities of daily living ( $\beta = -0.46$ ,  $p < 0.01$ ) and perceived social support ( $\beta = -0.20$ ,  $p < 0.05$ ) were found to be significant determinants of QoL of institutionalized older adults while activities of daily living ( $\beta = -0.28$ ,  $p < 0.05$ ) and nutritional status ( $\beta = -0.27$ ,  $p < 0.05$ ) were found to be significant determinants of QoL of non-institutionalized older adults. Cognitive impairments was not a significant determinant of QoL in both institutionalized and non-institutionalized older adults.

**Conclusions:** Promotion of physically active life style especially among young older adults to maintain their independence as they age and improvements of social support and social connectedness among older adults would be practical and cost-effective strategies to promote active aging in Sri Lankan older adults.

## HIGHLIGHTS

- Sri Lankan population is aging very fast, and the rates of institutionalization of older adults in the country is on an upward trend.
- Older adults in advanced ages, who are poor and no relatives are more likely to be institutionalized.
- Activities of daily living and perceived social support (PSS) were major determinants of the QoL of older adults.
- Promotion of physically active lifestyle at an early stages of life, and enhancement of social support and social interactions would benefit older adults to have successful life.

## 1. Introduction

Population aging is a global public health issue [1–3]. The decreasing trends in fertility and mortality seen in many countries have resulted in an increase in the proportion of older adults in their populations. In

low- and middle-income countries (LMIC), the growth of older population is not parallel to their economic growth, resulting in huge economic and health burdens for such populations [4,5]. Population projections suggest that by 2050, Asian countries, specifically India and China, will have the largest aging population in the world [1,4]. The concept of active aging,

\* Corresponding author.

E-mail addresses: [dilrukshi.anu5@gmail.com](mailto:dilrukshi.anu5@gmail.com) (A. Wickramasinghe), [mkgamage@yahoo.com](mailto:mkgamage@yahoo.com) (M. Gamage), [torabi@indiana.edu](mailto:torabi@indiana.edu) (M.R. Torabi), [bileshap@med.ruh.ac.lk](mailto:bileshap@med.ruh.ac.lk) [pperera@indiana.edu](mailto:pperera@indiana.edu) (B. Perera).

which emphasizes the need to enhance opportunities for health, participation, and security in order to increase the quality of life (QoL) of older adults, is central to decision-making and policy formulation in promoting health of older populations [2,5]. The well-being in physical, psychological, social, emotional, spiritual, and cultural dimensions are found to be associated with the overall QoL of older adults [2,3,5,6], but research in this holistic approach of determining the QoL of older adults is missing in geriatric and gerontological literature. Although sustainable and effective family and community care is imperative to enhance QoL of older adults, the family support received by older adults is shrinking as a result of urbanization and westernization processes that are seen in many LMICs today [5,7]. Weakening of traditional extended family structures occurring in many LMICs due to these reasons directly influence health and wellbeing of older adults living in those countries [5,6]. Consequently, these population trends have resulted a significant number of older adults in those countries becoming residents of nursing and elderly homes [5,7–10]. Female sex, lack of family support, advanced age, physical and cognitive disabilities, and a high number of drug prescriptions were found to be significant predictors of older adults' institutionalization. [5,9–11]. Common features of institutionalized older adults include low QoL, limited possibilities for leisure time activities, loneliness, cognitive and physical disabilities [9–11]. In contrast, overweight/obesity, difficulties in healthcare access, and poor nutrition were found to be common among community-dwelling older adults [12–14]. Critical evaluation of the actual contribution of such factors that contribute to health disparities and quality-adjusted life years (QALY) in older adults living in both institutionalized and non-institutionalized settings are needed to formulate geriatric health policies and interventions to create a healthy aging populations in LMICs. It has been observed that social connectedness and social support are the foremost determinants of the health and wellbeing of older adults, and acted as buffers against physiological and behavioural deficiencies they experience in older age [15,16]. Many older adults in Sri Lanka admit that ill-health conditions and disabilities that they experience are inevitable consequences of aging, and are quite prepared to live with them [17,18]. Yet, frequent interaction with family and other friends, and the caring and compassionate attitude of such persons towards them are highly expected and valued by older adults. Such support would facilitate them to combat with their loneliness, isolation and depressive moods which would impede their QoL [15,19,20].

Sri Lanka, a middle-income country in South Asia, has one of the fastest aging populations in Asia [21,22]. It is estimated that the percentage of adults aged 60 + years in the country will increase from 12.4% in 2012 to 29% in 2050. Abuse and neglect of older adults, accessibility and affordability issues in healthcare, severe shortages of geriatric healthcare services, lack of social security system and poverty have had detrimental effects on the health of older adults in the country [13,14,22,23]. Although a large majority of older adults in Sri Lanka live with their children or relatives in the community, institutionalization rates among older adults in Sri Lanka have increased in the recent past. In 2017, there were 306 elderly homes in the country, and in 2021, the corresponding figure was 349, a 14% increase [24]. Physical and cognitive conditions, nutritional status, social support, and QoL issues between the two groups, institutionalized and non-institutionalized older adults in Sri Lanka, have not been well researched. Such data are urgently needed to plan sustainable strategies to promote active aging concept among older adults and health policy maker in Sri Lanka. This study aimed to examine and compare the QoL of institution and community dwelling older Sri Lankan adults, and how nutritional, cognitive, physical activity limitation and social support affect QoL of this target population.

## 2. Materials and methods

### 2.1. Study setting and population

This study was conducted in a district in Southern Sri Lanka. The population composition in this district is similar to that of many others in Sri

Lanka. In 2019, the total estimated population in the district was 1,130,000, 10.1% of which were aged 65+ years [25] while the corresponding figure for the whole country was 10.9%. Both community-dwelling and institutionalized older adults in the district were the target population. In 2020 there were 22 elderly homes in this district, registered under the Department of Social Welfare, Sri Lanka, with a total of 835 older adult residents [24].

### 2.2. Sampling procedure

The required sample size was calculated with a confidence level of 95%, power of 80%, mean difference of the QoL score of the two groups as five, and the common standard deviation of QoL scores in the study populations as 10 [26]. Thus, 63 subjects were required for each group. In this study, 80 subjects were selected for each group, totaling 160 respondents. Inclusion criteria included older adults aged 60+ years with no cognitive or perceptual impairment or any serious physical disabilities (those who were unable to respond to the survey questions due to their physical disabilities) and who agreed to participate in the study.

### 2.3. Measurements

#### 2.3.1. WHOQOL-BREF

Quality of life was assessed using the short version of the WHOQOL-BREF [27] which was designed to measure an individual's perception of their QoL. It has 26 items and produces a profile of four domain scores: physical, psychological, environmental, and social relationships. High scores in the total score and each domain indicate a higher QoL. This tool has been validated among older adults in Sri Lanka. [28].

#### 2.3.2. Mini Mental State Examination (MMSE)

The MMSE is a 30-item, brief global instrument used to assess cognitive abilities in older adults [17]. The scores range from 0 to 30, and scores from 24–30 indicate no cognitive impairment, 18–23 mild cognitive impairment, and 0–17 severe cognitive impairment. The tool has been validated for older adults in Sri Lanka [29].

#### 2.3.3. Activities of Daily Living (ADL)

The Barthel index was used. It consists of 10 items and is used to estimate physical dependence [19]. The tool has been validated in Sri Lanka [30]. Barthel scores of 0-20 indicate "total" dependency, 21-60 indicate "severe" dependency, 61-90 indicate "moderate" dependency, and 91-99 indicates "slight" dependency.

#### 2.3.4. Mini Nutritional Assessment (MNA)

The MNA is a validated nutrition screening and assessment method that has been validated and widely used in Sri Lanka [31–33]. It recognizes geriatric patients aged 65 years and older who are malnourished or at risk of malnutrition. Using this scale, anthropometric measurements were taken to calculate the BMI of older adults. The total score was 14, and the score ranged from 12 to 14 (normal nutritional condition), 8 to 11 (risk of malnutrition), and 0 to 7 (presence of malnutrition).

#### 2.3.5. Multidimensional Scale of Perceived social Support (MSPSS)

The multidimensional scale of perceived social support (MSPSS) was used to assess perceived social support. The scale measures social support in three dimensions: family (FA), friends (FR), and significant others. The total score ranges from 7 to 84, and the subscale scores range from 4 to 28. Mean scores ranging from 1 to 2.9 could be considered as low support, a score from 3 to 5 as moderate, and from 5.1 to 7 as high support. The scale has 12 items and has been validated in Sri Lanka [34].

### 2.4. Data collection procedure

Data collection began after obtaining ethical clearance using an interviewer-administered questionnaire. Four elderly homes were

**Table 1**  
Socio-demographic characteristics of the sample subjects (n = 140).

Characteristic	Non-institutionalized Older adults (n = 80)		Institutionalized Older adults (n = 80)	
	N	%	N	%
Gender				
Male	31	38.8	47	58.7
Female	49	61.2	33	41.3
Age				
60-69	31	38.8	16	20.0
70-79	39	48.8	43	53.7
>80	10	12.4	21	26.3
Marital status				
Married	49	61.3	9	11.3
Unmarried	10	12.4	42	52.4
Divorced			4	5.0
Widowed	21	26.3	25	31.3
Monthly income				
No income	47	58.7	58	72.5
1000-5000	9	11.3	15	18.7
5000-10000	3	3.8	3	3.8
10000-30000	19	23.7	4	5.0
>30000	2	2.5		
Educational level				
Higher education	2	2.5	1	1.3
Up to A/L	23	28.7	9	11.3
Up to O/L	31	38.7	10	12.4
Grade 5 - 10	13	16.3	18	22.4
Grade 1 - 5	9	11.3	21	26.3
No school education	2	2.5	21	26.3
Early / current occupation				
Trained employee	18	22.5	11	13.7
Semi trained employee	23	28.8	26	32.5
Unskilled employee /Jobless	39	48.7	43	53.8

randomly selected out of 22, and at least 15 older adults from each elderly home who met the inclusion criteria were conveniently selected for the study. Attempts were made to survey an equal number of men and women. Community-dwelling older adults were selected from four areas in which the elderly homes were located. The list of households in the selected areas was obtained from the Grama Niladari officer (village headman), and a household with an older adult was randomly selected. Approximately 15 older adults living in the neighborhood of the selected households who met the inclusion criteria were selected for the survey.

**2.5. Ethical consideration**

Ethical approval for the study was obtained from the Ethical Review Committee of the Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka. Permission for collecting data from elderly homes was obtained from the Commissioner of the Social Services Department and from the in-charge of each elderly home selected. The purpose of the survey was explained to each of the selected subjects and their informed consent were obtained before the interview. The data that were collected were treated strictly confidential.

**Table 2**  
Mean (± SD) scores of the MMSE, ADL, MSPSS, MNA and WHOQOL BREF domains.

	Non-institutionalized			Institutionalized		
	All	Women	Men	All	Women	Men
MMSE score	25.6 (± 3.2)	25.1 (± 3.6)	26.3 (± 2.1)	20.9 (± 4.3)	20.4 (± 4.3)	21.7 (± 4.2)
ADL score	93.1 (± 10.3)	92.4 (± 9.2)	94.2 (± 11.8)	88.4 (± 13.9)	88.1 (± 13.6)	88.8 (± 14.6)
MSPSS score	5.5 (± 0.9)	5.5 (± 0.9)	5.6 (± 1.0)	3.9 (± 1.1)	4.0 (± 1.0)	3.8 (± 1.1)
MNA score WHOQOL-BREF	9.2 (± 2.9)	8.9 (± 2.6)	9.5 (± 3.3)	7.5 (± 2.4)	7.6 (± 2.6)	7.2 (± 2.0)
Physical health domain	67.5 (± 17.5)	67.9 (± 17.7)	66.7 (± 17.3)	55.2 (± 21.6)	56.7 (± 21.3)	53.0 (± 22.2)
Psychological health domain	71.8 (± 17.9)	71.6 (± 19.1)	72.2 (± 16.3)	62.5 (± 19.3)	66.9 (± 17.9)	56.2 (± 19.7)
Environmental health domain	71.9 (± 14.5)	72.6 (± 15.1)	70.8 (± 13.8)	74.3 (± 13.1)	75.2 (± 12.6)	72.9 (± 13.8)
Social relationship domain	51.8 (± 20.3)	51.0 (± 17.3)	53.2 (± 24.6)	40.4 (± 17.8)	42.0 (± 19.5)	38.1 (± 15.3)
Total QoL	63.1 (± 21.9)	63.5 (± 23.9)	62.5 (± 18.8)	49.1 (± 25.6)	54.5 (± 24.6)	41.3 (± 25.2)

**2.6. Analysis**

All the data collected were entered into a database, which was created using the statistical package of social science (SPSS v. 25.0), and analyzed using descriptive statistics including mean and SD. Independent sample t-test, Spearman’s correlation coefficient and one-way analysis of variance (ANOVA) were used in the analysis as appropriate. The significance level was taken as 5%.

**3. Results**

A total of 140 older adults were surveyed. A slightly higher number of men was surveyed (n = 73, 52.1%). The mean age of the non-institutionalized older adults was 72.1 years (SD = 7.5), and among institutionalized older adults, the corresponding figure was 74.9 years (SD = 8.1). The proportion of males in the institutionalized group was higher than that of non-institutionalized group and nearly 70% of non-institutionalized participants were studied at least up to secondary education while the corresponding figure for institutionalized group was only 25%. Table 1 shows the socio-demographic characteristics of the sample subjects.

As expected, institutionalized older adults were more likely to be older, less educated, and poorer than non-institutionalized older adults. Furthermore, nearly half of the institutionalized older adults (48.6%) were unmarried, and the corresponding figure for non-institutionalized older adults was 9.8% (Table 1).

The mean score of the overall total QoL was high among non-institutionalized older adults compared to that of institutionalized older adults (63.1 vs 49.1%, p < 0.01) (Table 2). Further, the mean scores of the physical, psychological, and social relationship components of QoL were found to be higher among non-institutionalized older adults than among those institutionalized (67.5% vs. 55.2%, p < 0.01, 71.8 vs 62.5%, p < 0.01 and 51.8 vs 40.4%, p < 0.01). No gender difference in the mean scores of total QoL was found in non-institutionalized older adults, but the total QoL seems to be higher among institutionalized women than institutionalized men (54.5% vs. 41.3%, p < 0.05). Among non-institutionalized older adults no significant difference of the total mean QoL score was observed between those of aged less than 70 years and others (64.9 verses 61.9, p > 0.05) or between those who reported no monthly income and others (63.0 verses 65.0, p > 0.05). (Table 2). Also among institutionalized older adults no significant difference of the total mean QoL score was observed between those of aged less than 70 years and others (41.4 verses 50.9, p > 0.05) or between those who reported no monthly income and others (50.6 verses 44.8, p > 0.05).

Multiple linear regression analysis was performed to examine how MMSE, MNS, MSPSS, and ADL scores are related to the scores QoL of institutionalized and non-institutionalized older adults. Table 3 shows the coefficients of the model and the results of the t-test, used to study the significance of the regression coefficients (βi) in the non-institutionalized group. The model predicts 17% of the variance in QoL of non-institutionalized older adults and this is statistically significant at p ≤ 0.05. The p-value was less than 0.05 for the variables nutritional status

**Table 3**  
Results of the multiple regression coefficients for non-institutionalized older adults (n = 80).

Dependent variable	Independent variable	B	β	t	Sig	95%	CI
QoL Score	(Constant)	-34.75		-0.977	0.332	-105.61	36.112
	Age	5.54	0.169	1.405	0.164	-2.31	13.41
	MMSE	0.043	0.006	0.054	0.957	-1.516	1.601
	MSPSS	2.166	0.093	0.855	0.396	-2.818	7.051
	MNS	2.002	0.265	2.406	0.019	0.344	3.660
	ADL	0.613	0.287	2.475	0.016	0.119	1.106

R<sup>2</sup> = 0.17

(MNS) and activities of daily living (ADL) indicating that poor nutrition and low level of activities of daily living tend to lower the QoL of the participants.

In the institutionalized group, the model predicts 29.5% of the variance in QoL of institutionalized older adults and this is statistically significant at p ≤ 0.05. Lower levels of perceived social support (MSPSS) and lower levels of activities of daily living (ADL) tend to lower the QoL of the institutionalized older adults (Table 4).

#### 4. Discussion

The overall QoL in non-institutionalized older deterioration adults in Sri Lanka appears to be higher than those who were institutionalized, as has been seen in many other LMIC Asian countries [35–38]. In this target population, older adults in advanced ages, who do not have a stable income and who are along or no relatives to take care of them were more likely to be institutionalized. The results revealed that individuals who need external support for their Activities of Daily Living (ADL) tend to have lower Quality of Life (QoL) of both institutionalized and non-institutionalized older adults. Among institutionalized older adults, perceived social support (PSS) was found to be a major determinant of their QoL.

Older adults in advanced age who are poor and do not have social security benefits or relatives to take care of them are highly likely to become residents in elderly homes (institutionalized) in Sri Lanka [39,40]. However, neither age nor the level of income were found to be significant determinants of QoL of both institutionalized and non-institutionalized older adults in this sample. These observations are not consistent with the results of similar studies conducted in other higher and lower income countries. Age was found to be negatively correlated with QoL [16,41,42]. However, Sonja Canković and colleagues (2016) found that age is not associated with physical, psychological and environment QoL of older adults residing in a retirement home in Serbia [43]. With regard to Socio-economic Status (SES), studies have shown that economic hardship is negatively correlated with QoL of older adults [13,44,45]. Nevertheless, a study done by Bielderman and colleagues (2015) found that there was no direct effect of SES on the quality of life of older adults [46]. They further demonstrated that SES does influence a person’s QoL through a person’s social and psychological functioning. A qualitative study conducted in Sri Lanka on older adults revealed that being free from burdens and responsibilities of the family and having a spiritual life were more important than income or independence

**Table 4**  
Results of the multiple regression coefficients for institutionalized older adults (n = 80).

Dependent variable	Independent variable	B	β	t	Sig	95%	CI
QoL Score	(Constant)	-45.13		-1.720	0.090	-97.43	7.165
	Age	3.08	0.082	0.834	0.407	-4.282	10.450
	MMSE	-0.785	-0.132	-1.342	0.184	-1.952	0.381
	MSPSS	4.877	0.203	2.010	0.048	0.043	9.771
	MNS	1.344	0.127	1.239	0.219	-0.818	3.506
	ADL	0.848	0.463	4.496	0.000	0.472	1.223

R<sup>2</sup> = 0.295

to have successful life in old age [17]. Cultural values and expectations of older adults in Sri Lanka are mainly based on Buddhist religious values and beliefs. Buddhism promotes simple life style, sustainable consumption patterns and reduces materialism [47]. The inevitable nature of deterioration of physical and psychological health with aging is clearly explained in Buddhist doctrines, and older adults know that diseases and disabilities in old age are unavoidable consequences and are quite prepared to live with those [17,39]. Thus, older adult in the country tend to be satisfied with their living conditions and health, and live happily if they have basic human needs, food, shelter and cloths. This understanding of the nature of human beings could be the reason why age and economic status are of less important for them to have a better quality life at the last stage of their lives.

Everyday tasks (ADLs) are essential for maintaining an independent life and are strongly associated with QoL. Results of the study revealed that the majority of non-institutionalized older adults were ‘slightly’ depend on others for their day to day activities, but institutionalized older adults were ‘moderately’ depend on others for their activities of daily living. It has been observed that in general, the overall prevalence of disability and functional limitations increase with advancing age [48,49] and our results are in line with that assertion. It is also noted that both institutionalized and non-institutionalized older adults in the sample have a higher Barthel index mean score compared to that of older adults in other countries indicating Sri Lankan older adults are relatively more physically active than older adults in many other countries [50,51]. Being an agricultural country, a vast majority of older adults in the country had been engaged in agricultural work when they were young, and therefore they are a physically active cohort. Probably due to this reason, a considerable proportion of older adults maintain good functional health even at an advanced age. In our study, ADL was found to be a determinant of QoL in both institutionalized and non-institutionalized older adults and it is consistent with the studies conducted in both upper income and low- and middle-income countries [52,53].

In many countries, poor psychological health in older adults is a major determinant of QoL [54,55]. In our sample, however, cognitive function did not significantly determined the QoL of either of the groups. A possible explanation for this observation would be the religious practices and related spiritual well-being seen in Sri Lanka older adults. Religious practices and beliefs tend to mitigate distress related to cognitive deficiencies [56]. Irrespective of where they live, older adults in the country tend to practice religious observations to cope with the challenges of growing old. Further, they believe that physical and psychological deteriorations are inevitable life events in old age and therefore tend to worry less about such deficiencies [17]. Even with older adults who experience lower levels of cognitive functions, religious activities provide relaxation, emotional well-being, and extensive social support networks to overlook such deficiencies. This in turn would possibly assist those with lower cognitive abilities to have a considerable level of quality in their life.

Complete and balanced nutrition is essential to have a healthy old age. In our non-institutionalized sample, poor nutritional status seem to lower QoL of the participants, but no such association was found in the institutionalized sample. This study further demonstrated that non-institutionalized older adults were less likely to be malnourished compared to institutionalized older adults. A greater variety of nutritious food items is available for non-institutionalized older adults to consume in their living environment, and they can freely choose the form of their diet, either as a liquid or as a solid, but this opportunity may not be available for institutionalized older adults; they have to consume what is provided by the elderly homes which may lack nutritional balance and the form of the food that they prefer to eat. Given that, on average, institutionalized older adults are older than non-institutionalized older adults, chewing and swallowing problems may be highly prevalent among institutionalized older adults [53,57]. In addition, since saliva tends to decrease with age, swallowing is harder for those in advanced ages. They may tend to accept feeding difficulties and limited food choices as natural. De Oliveira and colleagues [58] found a positive association between nutritional status and QoL of

institutionalised older adults in Brazil. A study conducted in Sri Lanka revealed that the prevalence of malnutrition among older persons who resided in nursing homes was about 30% [59] and lack of leisure activities, an important factor associated with QoL, have contributed to increase the risk of under nutrition. However, in institutionalized older adults, the majority are in advanced age groups and feeding difficulties are common. So they may tend to accept feeding difficulties and limited food choices as natural. Thus, nutritional status may not significantly affect the physical and psychological components of QoL of institutionalized older adults. It has been suggested that participants with better chewing ability tend to have significantly better cognitive functioning, ADLs, and nutritional status [57,60,61]. In contrast, non-institutionalized older adults have seen different food consumption patterns and choices the people in the community have, and therefore may tend to compare their own food choices with that of others. Since older adults generally have low purchasing power, they may feel worried about the limited food choices available for them compared to that of others and this would probably make them to feel that they are a marginalized group. This may adversely affect QoL of them.

Social support perceived by institutionalized older adults were lower than that of non-institutionalized older adults. Social interactions and social networks are important for older adults to have an active lifestyle and to improve their physical and mental well-being. Social participation and social networking are better in family setups than in elderly homes [15,19]. When family ties become weak, many older adults are vulnerable to loneliness and frustration, which could lower their QoL [17,62,63]. Results of our study support his assertion because nearly half of the institutionalized older adults (48.6%) were unmarried, and the corresponding figure for community-dwelling older adults was only 9.8%. Engaging in leisure physical activities with friends or family members could improve mental health and happiness [15,19,20,64]. These could be the main reasons why poor social support is a predictor of lower QoL in institutionalized older adults. This finding is consistent with the studies conducted in other low- and middle-income countries in Asia. A study conducted in India showed that shattered dignity and lack of love and affection from family members contribute to lower QoL among institutionalized older adults [37]. A study conducted in China revealed that advanced age, chronic health conditions, and loneliness as the main predictors of lower QoL in institutionalized older adults [62]. Poor social support is indirectly related to functional disability through proactive coping [65]. Coping is enhanced by receiving more and more emotional and instrumental support and this, in turn, relates to better physical functioning. In high income countries, high purchasing power of older adults allows them to stay in their homes for most of their later life and they are only institutionalized if they have chronic physical or psychological health conditions [60]. As an agricultural country for centuries, a vast majority of older adults in Sri Lanka do not have a stable income and are largely dependent on their children or relatives to survive in their later life. These family-based supportive systems are in jeopardy due to urbanization, an increase in female labour participation, and due to changes in the cultural value system in the country. These socio-cultural, demographic and economic trends have contributed to lower health and QoL of both institutionalized and non-institutionalized older adults in the country [66].

## 5. Conclusions

The overall QoL of older adults living in community settings is higher than that of institutionalized older adults in Sri Lanka. Physical dependence seem to adversely affect the QoL of both institutionalized and non-institutionalized older Sri Lankans. Cognitive disabilities did not contribute to frail QoL in older adults in either group. Poor nutritional status appears to lower the QoL of non-institutionalized older adults. Social support and social interactions are constrained among institutionalized older adults, and such limitations would probably adversely affect their QoL. Family and close friends tend to exhibit a caring and compassionate attitude towards older adults living with them, and past experiences of such life

interactions give them the feeling that they are loved, accepted, and understood. This form of emotional support would help non-institutionalized older adults to combat feelings of loneliness. This affectionate love is largely missing for institutionalized older adults and it would probably make them vulnerable to have lower QoL. In resource limited countries like Sri Lanka, social support would be relatively a more important modifiable risk factor that could influence health disparities and quality-adjusted life years of older adults. The fact that a significant number of older adults are forced to move into elderly homes in the near future, policies and strategies to tackle issues of physical dependence, social support, and interactions in institutionalized older adults are needed to be considered by old age health care policy makers. On the other hand, a large proportion of older adults in Sri Lanka are expected to live in community settings with their relatives in the coming decades. However, social networks and social interactions will be shrunk in the future due to urbanization and westernization of the society, and therefore a significant proportion of older adults in the country will have prepared to live alone in the future and that may adversely affect their psychological well-being.

## 6. Recommendations

Since promotion of physical activity behavior from early stages of life is an effective strategy to enhance physical functional abilities in old age, primary care physicians and grassroots level health care professionals should motivate older adults in population health education activities to have physically active life style. Further they should establish proper screening programs to detect those who are at risk of developing functional disabilities at an early stage of their senior life for effective interventions.

Given that chronically ill health conditions and associated physical disabilities were highly prevalent in both institutionalized and non-institutionalized older adults, geriatric screening facilities should be improved and expanded in the country to identify vulnerable individuals who are at risk of developing chronic diseases at an early stage to direct them for treatments or lifestyle changes. Religious and spiritual health promotion programs for older adults should be developed, and mechanisms should be identified to link such programs to primary healthcare services.

Since the government of Sri Lanka faces a severe financial crisis at present, extremely limited funds are available for geriatric health and social care services. Thus, cost effective population strategies such as formation of elderly societies and age-friendly cities to promote physically active lifestyle with enhanced social support and social connectedness for them are needed to be considered at national policy formulation forums.

Further studies are however warranted in this field as there are other vital factors, such as alcohol consumption and family support, which may contribute to nutritional status and QoL in older adults. A strong dialogue between applied gerontology and social network research is needed. This would facilitate policy makers to plan programs that facilitate older adults to take part in society as indicated by their needs, desires, and limits.

### Data availability

The authors are willing to provide the data set of this research upon reasonable request.

### Authors contribution

AW initiated the research work, selected the research design, collected data, analyzed the data and prepared the draft manuscript; MT provided critical comments on the draft. MG and BP performed the data analysis and wrote the final manuscript. All authors have read and approved the final manuscript.

### Funding statement

This research did not receive any funding from any source.

## Declaration of Competing Interest

No conflict of interest.

## Acknowledgement

The authors are grateful to all the participants in this study for their generous contribution.

## References

- [1] United Nations. Department of Economic and Social Affairs, Population Division. World Population Prospects 2019: Highlights (ST/ESA/SER.A/423). Available online. <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>; 2019.
- [2] Ory MG, Smith ML. Editorial: Insights in Aging and Public Health. *Front Public Health*. 2022;10:929418. <https://doi.org/10.3389/fpubh.2022.929418>.
- [3] Sadana R, Blas E, Budhwani S, et al. Healthy ageing: Raising awareness of inequalities, determinants, and what could be done to improve health equity. *The Gerontologist*. 2016;56(Suppl.2):S178–93. <https://doi.org/10.1093/geront/gnw034>.
- [4] Chang AY, FSKirbekk VF, Tyrovolas S, et al. Measuring population ageing: an analysis of the Global Burden of Disease Study 2017. *Lancet Public Health*. March 2019;4(3): e123–4. [https://doi.org/10.1016/S2468-2667\(19\)30019-2](https://doi.org/10.1016/S2468-2667(19)30019-2).
- [5] Asian Development Bank. Growing older before becoming rich: challenges of an aging population in Sri Lanka; 2019. <https://doi.org/10.1038/355392a>.
- [6] Ghosh D, Dinda S. Determinants of the Quality of Life among Elderly: Comparison between China and India. *Int J Commun Social Dev*. 2020;2(1):71–98. <https://doi.org/10.1177/2516602620911835>.
- [7] Pan J, Chang M. Population aging, middle-income trap, and economic growth: an empirical study of Asian economies. *Singap Econ Rev*. 2019;1:18. <https://doi.org/10.1142/s0217590818420092>.
- [8] Zhao YW, Haregu TN, Li H, et al. The effect of multimorbidity on functional limitations and depression amongst middle-aged and older population in China: a nationwide longitudinal study. *Age Ageing*. 2021;50(1):190–7. <https://doi.org/10.1093/ageing/afaa117>.
- [9] Wang Q, Botisem GA, Jin A, et al. Preferences for long term care insurance in China: Results from a discrete choice experiment. *Soc Sci Med*. 2021;281:114104. <https://doi.org/10.1016/j.socscimed.2021.114104>.
- [10] Canković S, Nikolić EA, Jovanović VM, et al. Quality of life of elderly people living in a retirement home. *Vojnosanit Pregl*. 2016;73(1):42–6. <https://doi.org/10.2298/vsp131205126c>.
- [11] Stolarz I, Baszak EM, Zawadka M, et al. Functional Status, Quality of Life, and Physical Activity of Senior Club Members—A Cross-Sectional Study. *Int J Environ Res Public Health*. 2020;17(19):7221. <https://doi.org/10.3390/ijerph1719031900>.
- [12] Roderka MN, Puri S, Batsis JA. Addressing Obesity to Promote Healthy Aging. *Clin Geriatr Med*. 2020;36(4):631–43. <https://doi.org/10.1016/j.cger.2020.06.006>.
- [13] Rathnayake S, Siop S. Quality of Life and Its Determinants among Older People Living in the Rural Community in Sri Lanka. *Indian J Gerontol*. 2015;29(2):131–53. <https://ir.unimas.my/id/eprint/10265/1/Sarath.pdf>.
- [14] Damayanthi H, Moy F, Abdullah K, et al. Health related quality of life and its associated factors among community-dwelling older people in Sri Lanka: A cross-sectional study. *Arch Gerontol Geriatr*. 2018;76:215–20. <https://doi.org/10.1016/j.archger.2018.03.009>.
- [15] León LP, JPL Mangin, Ballesteros S. Psychosocial determinants of Quality of Life and active aging. A structural equation model. *Int J Environ Res Public Health*. 2020;17(17):6023. <https://doi.org/10.3390/ijerph17176023>.
- [16] Brett CE, Dykiert D, Starr JM, et al. Predicting change in quality of life from age 79 to 90 in the Lothian Birth Cohort 1921. *Qual Life Res*. 2019;28:737–49. <https://doi.org/10.1007/s11136-018-2056-4>.
- [17] Perera B, Watt M, Ostbye T, et al. Perceptions of successful aging in Sri Lankan older people: a qualitative study. *Asian J Gerontol Geriatr*. 2015;10:22–30. <http://ajgg.org/AJGG/V10N1/2013-161-OA.pdf>.
- [18] Watt M, Perera B, Ostbye T, et al. Care-giving expectations and challenges among elders and their adult children in Southern Sri Lanka. *Aging Soc*. 2014;34(5):838–58. <https://doi.org/10.1017/S0144686X12001365>.
- [19] Asante S, Karikari G. Social Relationships and the Health of Older Adults: An Examination of Social Connectedness and Perceived Social Support. *J Ageing Longev*. 2022;2:49–62. <https://doi.org/10.3390/jal2010005>.
- [20] Greenglass E, Fiksenbaum I, Eaton J. The relationship between coping, social support, functional disability and depression in the elderly. *Anxiety Stress Coping*. 2006;19(1):15–31. <https://doi.org/10.1080/14659890500436430>.
- [21] Department of Census and Statistics and Ministry of Health, Indigenous Medicine. Sri Lanka Demographic and Health survey 2016, Colombo, Sri Lanka. Available online: <http://www.statistics.gov.lk/Health/StatInf/2016>; 2017.
- [22] Samaraweera D, Maduwage S. Meeting the current and future health-care needs of Sri Lanka's ageing population. *WHO South-East Asia J Public Health*. 2016;6(2):96–101. <https://apps.who.int/iris/handle/10665/329655>.
- [23] Edirisinghe P, Paranithan P, Perera W, et al. Elder abuse among outpatient department attendees in a tertiary care hospital in Sri Lanka. *Ceylon Med J*. 2014;59(3):84–9. <https://doi.org/10.4038/cmj.v59i3.6527>.
- [24] The Department of Social Welfare, Probation and Child Care Services, Sri Lanka. Available online. <http://www.socialproba.cp.gov.lk/en/social-welfare-services/services-for-the-elders.html>. (I retrieved it in 2022).
- [25] Department of Census and Statistics. Ministry of Economic policies & Plan Implementation Statistical Pocketbook. <http://www.statistics.gov.lk/>; 2021. Accessed 10 April, 2022.
- [26] Santhalingam S, Sivagurunathan S, Prathapan S, et al. The association of health-related factors with quality of life among the elderly population in the Jaffna district of Sri Lanka. *BMC Public Health*. 2021;21:464. <https://doi.org/10.1186/s12889-021-10507-3>.
- [27] Skevington S, Lotfy M, O'Connell K. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. A Report from the WHOQOL Group. *Qual Life Res*. 2004;299–310. <https://doi.org/10.1023/B:QURE.0000018486.91360.00>.
- [28] De Silva K, Liyanage C, Wijesinghe CJ, Perera B. Validation of the WHOQOL-BREF questionnaire for older people in Sri Lanka. Annual Academic Sessions of the Ruhunu Clinical Society, Marara, Sri Lanka; 2018.
- [29] De Silva H, Gunathilaka S. MMSE in Sinhalese a sensitive test to screen for dementia in Sri Lanka. *Int J Geriatric Psychiatry*. 2002;17(2):134–9. <https://doi.org/10.1002/gps.541>Citations: 27.
- [30] Lekamwasam S, Karunatilake K, Kankanamge S, et al. Physical dependency of elderly & physically disabled; measurement concordance between 10 – item Barthel index & 5 – item shorter version. *Ceylon Med J*. 2011;56(3):114–8. <https://doi.org/10.4038/cmj.v56i3.3603>.
- [31] Rubenstein L. Screening for Under-nutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). *J Gerontol*. 2001;56A:366–77. <https://doi.org/10.1093/gerona/56.6.m366>.
- [32] Fernando W, Wijesinghe D. Assessment of Nutritional Status and Disease Prevalence among Elderly Population in Elderly Homes in Kandy. *Tropical Agric Res*. 2011;21(3):229–37. <https://doi.org/10.4038/tar.v21i3.3296>.
- [33] De Silva K, Liyanage C, Wijesinghe C, et al. The association between nutritional status and depressive symptoms among older people in Galle district. Presented at the 51st APACPH Conference, Bangkok, Thailand; 2019.
- [34] Weerathunga E, Senadeera C, Hettiarachchi M, et al. Validity and Reliability of the Multi-dimensional Scale of Perceived Social Support (MSPSS) in Cancer Patients. Proceedings of the International Research Conference – 2018. Ratmalana, Sri Lanka: General Sir John Kotelawala Defence University; 2018.
- [35] De Medeiros MMD, Carletti TM, Magno MB, et al. Does the institutionalization influence elderly's quality of life? A systematic review and meta-analysis. *BMC Geriatr*. 2020;20:44. <https://doi.org/10.1186/s12877-020-1452-0>.
- [36] Amonkar P, Mankar MJ, Thatkar P, et al. A comparative study of health status and quality of life of elderly people living in old age homes and within family setup in Raigad District, Maharashtra. *Indian J Community Med*. 2018;43:10–7.
- [37] Rao AN, Trivedi Y, Yadav V. Assessing the Life Satisfaction of Elderly Living in Old Age Homes in the City of Ahmedabad. *Indian J Gerontol*. 2015;29(2):154–69.
- [38] Akça F, Sahin G. A study comparing the quality of life and related psychological symptoms of the elderly living in nursing homes, with the ones living with their families. *Turkish J Geriatr*. 2008;11(4):190–9.
- [39] Malinga SH, Wijesiri SK, Samarasinghe D. Loneliness among older people living in care homes in Sri Lanka. *Int J Older People Nursing*. 2019;14:e12253. <https://doi.org/10.1111/ohn.12253>.
- [40] Gamage MWK, Hewage C, Pathirana KD. Effect of cognitive and executive functions on perception of quality of life of cognitively normal elderly people dwelling in residential aged care facilities in Sri Lanka. *BMC Geriatr*. 2018;18:256. <https://doi.org/10.1186/s12877-018-0937-6>.
- [41] Tang K, Jik-Joen L. Global Social Justice for Older People: The Case for an International Convention on the Rights of Older People. *Br J Soc Work*. 2006;36(7):1135–50. <http://www.jstor.org/stable/23721353>. Accessed 28 Jul. 2022.
- [42] Rizal H, Said MA, Abdul Majid H, et al. Health-related quality of life of younger and older lower-income households in Malaysia. *PLoS One*. 2022;17(2):e0263751. <https://doi.org/10.1371/journal.pone.0263751>. Accessed 3 July, 2022.
- [43] Canković S, Nikolić EA, Jovanović VM. Quality of life of elderly people living in a retirement home. *Vojnosanit Pregl*. 2016;73(1):42–6. <https://doi.org/10.2298/vsp131205126c>.
- [44] Netuveli G, Wiggins RD, Hildon Z, et al. Quality of life at older ages: evidence from the English longitudinal study of aging (wave 1). *J Epidemiol Community Health*. 2006;60(4):357–63. <https://doi.org/10.1136/jech.2005.040071>.
- [45] Samadarshi A, Taechaboonsrermak SC, Tipayamongkolgul P, et al. Quality of life and associated factors amongst older adults in a remote community. *Nepal, J Health Res*. 2022;36(1):56–67. <https://doi.org/10.1108/JHR-01-2020-0023>.
- [46] Bielderman A, de Greef MH, Krijnen WP, et al. Relationship between socioeconomic status and quality of life in older adults: a path analysis. *Qual Life Res*. 2015;24(7):1697–705. <https://doi.org/10.1007/s11136-014-0898-y>.
- [47] Pace S. Does Religion Affect the Materialism of Consumers? An Empirical Investigation of Buddhist Ethics and the Resistance of the Self. *J Bus Ethics*. 2013;112(1):25–46. <https://www.jstor.org/stable/23324955>.
- [48] Gureje O, Ogunniyi A, Kola L, et al. Functional Disability in Elderly Nigerians: Results from the Ibadan Study of Aging. *J Am Geriatr Soc*. 2006;54:1784–9. <https://doi.org/10.1111/j.1532-5415.2006.00944.x>.
- [49] Abdurraheem IS, Oladipo AR, Amodu MO. Prevalence and Correlates of Physical Disability and Functional Limitation among Elderly Rural Population in Nigeria. *J Aging Res*. 2011;2011:369894. <https://doi.org/10.4061/2011/369894>.
- [50] Stolarz I, Baszak EM, Zawadka M et al. Functional Status, Quality of Life, and Physical Activity of Senior Club Members—A Cross-Sectional Study. *Int J Environ Res Public Health*. 2022;19(3):1900. <https://doi.org/10.3390/ijerph19031900>.
- [51] Fidecki Wiesław, Wysokiński Mariusz, Kulina Dorota, Kuszplak Kamil. Assessment of the functional efficiency of the elderly. *Polish J Public Health*. 2021;130(1):45–7. <https://doi.org/10.2478/pjph-2020-0010>.
- [52] Higgins MM, Barkley MC. Barriers to nutrition education for older adults, and nutrition and aging training opportunities for educators, healthcare providers, volunteers and caregivers. *J Nutr Elder*. 2004;23(4):99–121. <https://doi.org/10.1300/j052v23n04.07>.

- [53] Sharma S, Yadav DK, Karmacharya I, et al. Quality of Life and Nutritional Status of the Geriatric Population of the South-Central Part of Nepal. *J Nutr Metab*. 2021;6621278. <https://doi.org/10.1155/2021/6621278>.
- [54] Medhi GK, Sarma J, Pala S, et al. Association between health related quality of life (HRQOL) and activity of daily living (ADL) among elderly in an urban setting of Assam, India. *J Family Med Prim Care*. 2019;8(5):1760–4. [https://doi.org/10.4103/jfmpc.jfmpc\\_270\\_19](https://doi.org/10.4103/jfmpc.jfmpc_270_19).
- [55] Atkins J, Naismith SL, Luscombe GM, et al. Psychological distress and quality of life in older persons: relative contributions of fixed and modifiable risk factors. *BMC Psychiatry*. 2013;13:249. <https://doi.org/10.1186/1471-244X-13-249>.
- [56] Amir SN, Juliana N, Azmani S, et al. Impact of Religious Activities on Quality of Life and Cognitive Function Among Elderly. *J Relig Health*. 2022;61:1564–84. <https://doi.org/10.1007/s10943-021-01408-1>.
- [57] Govindaraju T, Sahle BW, McCaffrey TA, et al. Dietary Patterns and Quality of Life in Older Adults: A Systematic Review. *Nutrients*. 2018;10:971. <https://doi.org/10.3390/nu10080971>.
- [58] De Oliveiraa LFS, Wanderley RL, Medeiros MM, et al. Health-related quality of life of institutionalized older adults: Influence of physical, nutritional and self-perceived health status. *Arch Gerontol Geriatr*. 2021;92. <https://doi.org/10.1016/j.archger.2020.104278>.
- [59] Rathnayake KM, Wimalathunga M, Weech M, Jackson KG, Lovegrove JA. High prevalence of undernutrition and low dietary diversity in institutionalised elderly living in Sri Lanka. *Public Health Nutr*. 2015;18(15):2874–80. <https://doi.org/10.1017/s1368980015000749>.
- [60] Grassi L, Caruso R, Da Ronch C, et al. Quality of life, level of functioning, and its relationship with mental and physical disorders in the elderly: results from the MentDis\_ICF65+ study. *Health Qual Life Outcomes*. 2020;18:61. <https://doi.org/10.1186/s12955-020-01310-6>.
- [61] Jung YS, Park T, Kim EK, et al. Influence of Chewing Ability on Elderly Adults' Cognitive Functioning: The Mediating Effects of the Ability to Perform Daily Life Activities and Nutritional Status. *Int J Environ Res Public Health*. 2022;19:1236. <https://doi.org/10.3390/ijerph19031236>.
- [62] Wu M, Yang Y, Zhang D, et al. Association between social support and health-related quality of life among Chinese rural elders in nursing homes: The mediating role of resilience. *Qual Life Res*. 2018;27:783–92. <https://doi.org/10.1007/s11136-017-1730-2>.
- [63] García EL, Banegas JR, Pérez-Regadera AG, et al. Social network and health-related quality of life in older adults: A population-based study in Spain. *Qual Life Res*. 2005;14:511–20. <https://doi.org/10.1007/s11136-004-5329-z>.
- [64] Marsh C, Agius PA, Jayakody G, et al. Factors associated with social participation amongst elders in rural Sri Lanka: a cross-sectional mixed methods analysis. *BMC Public Health*. 2018;18:636. <https://doi.org/10.1186/s12889-018-5482-x>.
- [65] Fiksenbaum LM, Greenglass ER, Eaton J. Perceived Social Support, Hassles, and Coping Among the Elderly. *J Appl Gerontol*. 2006;25(1):17–30. <https://doi.org/10.1177/0733464805281908>.
- [66] Munasinghe KM. Economic Crisis in Sri Lanka and its Impact on Older Adults. Available online. <https://www.ageing.ox.ac.uk/blog/Economic%20crisis%20in%20Sri-Lanka-and-its-impact-on-older-adults>; 2022.