Factors associated with older persons' physical health in rural Uganda

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Abstract

Introduction: The proportion of older persons (OPs) in developing countries is increasing with no clear evidence of improvement in physical health. The aim of this paper was to examine the factors associated with older persons' physical health in rural Uganda.

Methods: This paper is based on a cross-sectional study of 912 older persons age 60 years and older across four major regions of Uganda. The study was conceptualized basing on World Health Organization quality of life BREF (WHOQOL-BREF). Ordinal logistic regression was used to determine the factors associated with physical health.

Results: Physical health was good (OR=3.64; p**<0.001**) among OPs who controlled their household assets or their spouses (OR=4.47; p**<0.001**) relative to those whose assets were controlled by children and among those who engaged in physical activities (OR=2.28; p**<0.001**) compared to those who did not.

Conclusion: The findings have various policy implications, such as sensitizing them to exercise regularly.

Key words:

Ageing, Older persons, Body pain, Physical health.

Introduction

Globally, human life expectancies have greatly improved with much progress happening in developing countries. It is projected that almost 80% of the world's ageing population will be living in developing world [1]. The proportion of Africa's older population is expected to increase from 5.1% in 2000 to 10.4% by 2050 [2, 3]. In sub-Saharan Africa, ageing population is taking place amidst challenges such as shortage of health infrastructure and services [4, 5]. This is worsened by the rise in non-communicable diseases such as cancer, cardiovascular diseases and several other later life health difficulties [6, 7]. Basing on the United Nations (UN) definition of older persons as those age 60 years and older [3], this study examines factors associated with physical health among older persons in rural Uganda.

Uganda's population is largely characterized by young people. Nonetheless, the country's older population is increasing steadily due to the high rate of survival and reduction in adult mortality [8, 9]. Estimated at 63 years, Uganda's life expectancy has surpassed sub-Saharan Africa's average of 60 years [9, 10]. The number of Uganda's older persons age 60 years and above almost doubled between 1991 and 2002 (from 686,000 to 1.1 million persons)and increased to 1.6 million in 2014 [9]. Older persons constitute 4 percent of the total population [11]. The increase in ageing population is however against the backdrop of deterioration of social and family support systems that sustain the physical health and wellbeing of older persons [12]. For instance, rural-urban migration has drastically affected the care and support rendered to older persons [8]. Moreover, the existing social problems such as unemployment limit families' capacities to support rural older persons' healthcare [7, 8, 13].

Physical health dimension is one of the key indicators of people's quality of life [14]. It includes activities of daily living, mobility status, fatigue; body pain, and sleep [15]. Poor physical health is the

source of fear and discomfort among OPs thereby curtailing their productivity and reducing them to beggars and dependents [12]. Although research underscores the importance of physical health for OPs, this area remains understudied in Uganda [2, 11]. Existing literature about ageing population has mainly focused on loneliness [16], vulnerability of older adults [17], chronic poverty among elderly [18], nutritional status and functional ability of the elderly [19] and understanding the vulnerability of older adults [13]. Moreover, some of these studies used data covering a limited geographical scope and collected some years back. It is expected that the factors that influence physical health could have changed over time. Empirical evidence regarding factors influencing physical health among OPs is lacking. This research builds on earlier studies [13, 15, 17, 18] to bridge this knowledge gap. Using a recent empirical data from a wide geographical scope, we examine the factors influencing physical health of older persons in rural Uganda.

Materials and methods

This paper utilized data from a cross sectional study on determinants of quality of life of 912 older men and women age 60 years and above in rural Uganda; representing a response rate (RR) of 95%. RR was calculated using the fourth formula from those recommended by the American association for Public Opinion Research [20]. The data were collected from February to March, 2017. Before data collection, enumerators with minimum qualification of a Bachelor's degree were identified and recruited from respective study districts. These were trained on various aspects including research ethics, how to conduct interviews, and administering a questionnaire. Each interview took 35-45 minutes on average. During interviews, we made sure that we did not include persons who were sick. Multi-stage stratified cluster sampling approach was used. Uganda was stratified into four major regions namely; central, eastern, northern and western regions. Using simple random sampling, one district was selected from each of the four regions. In each district, three sub-counties were selected using simple random sampling. Four villages were selected using simple random sampling from each

of the selected sub-counties, providing a total of 12 villages per district and hence 48 villages in the whole of Uganda. Using a community leader, a list of households with older persons was generated per village. Thereafter, ten households were randomly selected and older persons from 480 households were interviewed using an interviewer-administered questionnaire.

Physical health indicators were adapted from the World Health Organization Quality of Life (WHOQOL-BREF instrument). The WHOQOL-BREF is a World Health organization instrument that measures physical health, psychological health, social relationships, and environment [15, 21].It consists of 26 items, 24 of which are divided into four domains: physical health, mental health, social relationships, and environment. This study adapted with modifications the indicators of physical health dimension of quality of life. The items under this dimension include activities of daily living, mobility status, fatigue; body pain, and sleep [15]. The WHOQOL-BREF was preferred because it is flexible and is used on people from different cultures.

Variables and measures

The dependent variable was physical health which was in form of an index. Independent variables were; age (60 years and older), sex (male or female), marital status (current marital status of respondent), region (region of residence), education level (education level acquired), religion (religion of respondent), type of house (whether house was permanent, semi-permanent or temporary), radio set ownership (whether respondent owned a radio or not), mobile phone ownership (whether respondent owned mobile phone or not), electricity (whether the respondent's house had electricity or not), land ownership (whether responded owned land or not), control over household assets (who controlled household assets of the respondent), living arrangement (whether respondent lived alone or with others), financial support (whether respondent was financially supported or not), health care (who provided health care to respondent during sickness), distance to nearest health center (distance of nearest health facility from respondent's home in kilometers), HIV/AIDS sero-status (whether

respondent was sero positive or sero negative), physical activity (whether respondent performed physical activities or not and fuel type (type of fuel used for cooking).

Data analysis

Frequency distributions were computed to describe background characteristics of the respondents. Cross tabulations were done to determine the association between physical health and independent variables. A chi-square test statistic with a corresponding p-value was used to establish the significance of the association between the two variables. The level of statistical significance was fixed at 95% confidence (p=0.05). Sampling weights were calculated to correct for imperfections resulting from selection of units with unequal probabilities.

We employed factor analysis (FA) to create an index for physical health using the 5 different indicators of; activities of daily living (whether respondent participated in activities of daily living or not), mobility status (whether respondent experienced mobility challenges or not), fatigue (whether respondent experienced fatigue or not); body pain (whether respondent experienced body pain or not), and sleep (whether respondent experienced any difficulties while sleeping or not). Factor loadings were rotated using quartimin oblique method for the loadings to reveal a clear pattern or the simple structure [22]. The selection of this rotation method was made based upon its popularity in use and availability in statistical software which seeks to minimize complexity only within the indicator variables [23] The technique was thus used to look for variables that factor well together but also with notable loading magnitude in absolute terms. High correlation among these indicators helped to produce a lower number of latent variables that fit common patterns in the data. Basing on the number of factors extracted, an index for the identified factors was calculated through linear combination between observed and factor loadings. Bartlett test of sphericity and the Kaiser-Meyer-Olkin (KMO) criterion [24] were performed to verify whether indicators in each category shared a common core. The Bartlett test was used to estimate the probability that the correlation matrix is zero, implying that all the

variables are uncorrelated, while the KMO was used to indicate the extent to which variables had common feature to warrant factor analysis. KMO scores above 0.5 (threshold scores) were acceptable; scores above 0.9 were exceptional [25]. In this study, the analysis yielded a KMO value of 0.814, while the Bartlett test yielded $\chi^2_{253} = 7057.335$ ($p=0.000$), signifying the data's adequacy for factor analysis.

Since the outcome variable formed through FA was in form of index, the study objective was achieved by use of the ordered logistic regression model. The dependent variable (Physical health) was grouped into three categories. That is, good, fair and poor basing on the range with which a respondent's score laid. In this dimension of quality of life used in this study, individuals are expected to have varying levels of physical health with some better off or worse off than others. The strengths of the relationships were reported as odds ratios. The p-value was used to determine whether the relationship was significant or not depending on the level of significance which was fixed at 0.05.

Ethical considerations

Before data collection, ethical clearance was granted by National HIV/AIDS research committee (NARC, Ref: ARC 190), Uganda National Council for Science and Technology (UNCST, Ref: SS 4167) and Office of the President of the Republic of Uganda (Ref: ADM 194/212/01). While collecting data, voluntary written informed consent was obtained from all respondents prior to the interviews and participants were assured of confidentiality. All information was provided in the relevant local languages (Rukiga, Langi, Luganda and Lusoga).

Results and Discussion

Descriptive characteristics of the older persons

Table 1 shows that the proportion of older persons reduced with advancement in age. The majority of the respondents (51%) were age 60-69 years. More than half of the respondents (57%) were females. Although five in every ten respondents (51%) were currently married, the level of widowhood was

also noticeably high (40%). Regions were proportionately represented with central having the highest proportion (27%). More than a half (54%) had no formal education and 40% had primary education; 32% were in the poorest wealth quintile. Majority of the respondents (76%) controlled their household resources and 74% lived with their children and grandchildren. Over half (56%) were not receiving financial support; 41% were getting healthcare support from their children; 48% travelled for 1-2 kilometers to reach the nearest health center; 97% were HIV sero negative; nearly three-quarters (74%) were engaging in physical activity; Respondents in the categories of physical health namely; good, fair and poor were equally represented (33%) as seen in Table 1.

Table 1 Percent distribution of respondents by selected socio-demographic characteristics

Variable	Number	Percent (%)
Age		
60 – 69	462	50.7
70 – 79	290	31.8
80+	160	17.5
Sex		
Male	395	43.3
Female	517	56.7
Marital status		
Married	461	50.6
Widowed	361	39.5
Divorced/Separated	90	9.9
Region		
Central	248	27.2
East	237	25.9
North	190	20.8
West	237	25.9
Education level		
No education	495	54.3
Primary	363	39.8
Secondary	31	3.4
Tertiary	23	2.5
Wealth index		
Poorest	293	32.1
Poorer	73	8.0
Middle	183	20.1
Richer	206	22.6
Richest	157	17.2
Control Over household assets		
Self	693	76.0

Spouse	132	14.5
children	87	9.5
Living arrangement		
Alone	80	8.8
Spouse only	22	2.4
Spouse & Children	133	14.6
Children & Grandchildren	677	74.2
Financial support		
Yes	404	44.3
No	508	55.7
Healthcare in sickness		
Spouse	308	33.8
Children	377	41.3
Grandchildren	91	10.0
Others	136	14.9
Distance to the nearest health center		
0 - 0.5 Km	170	18.6
1 -2 Km	433	47.5
> 2 Km	309	33.9
HIV/AIDS		
Positive	28	3.2
Negative	854	96.8
Do physical activities		
Yes	678	74.4
No	233	25.6
Physical health		
Poor	304	33.3
Fair	304	33.3
Good	304	33.3

Rotated factor loadings against indicators of intimacy among older persons

Table 2 shows a clear indicator structure of intimacy among older persons. All the 11 selected indicators in the Table loaded heavily on physical health dimension signifying high correlations. After rotation, none of the indicators exhibited cross-loadings along this dimension and therefore, all of them were retained for analysis. It should however be noted that using a threshold of 0.4, the results in Table 2 indicate that physical health among older persons was highly correlated with 9 indicators namely; difficulties in seeing, difficulties in moving, difficulties with feeding, difficulties with taking a bath, difficulties while dressing, body pain in the past one month, pain around the joints in past 3 months, easily get tired and difficulties in sleeping. This implies that older persons experience indicators of physical health whose loading magnitude was 0.4 and above more than others with loading magnitude below 0.4.

Table 2 Summary of rotated factor loadings against indicators

	Factor 1 'Social participation'	Factor 2 'Physical health'	Factor 3 ' Intimacy'
Social participation			
Participates in religious functions	**0.8564**	-0.0133	-0.0311
Participates in elderly clubs/groups specific to eleders	0.2961	0.1555	-0.0276
Participates in local ceremonies	**0.6398**	-0.0891	0.0591
Participates in visiting friends	**0.7773**	0.0473	0.0368
Participates in charity walks	0.2099	0.2214	0.0472
Participates in social gatherings	**0.4601**	-0.0571	0.1289
Participates in community meetings	**0.7318**	0.0402	0.0280
Participates in burial/funeral	**0.8561**	-0.0253	-0.0329
Physical health			
I always have difficulties in hearing	0.1013	0.3696	-0.0645
I always have difficulties in seeing	0.0848	**0.4653**	0.0672
I always have difficulties in moving on my own	-0.0077	**0.6030**	-0.0549
I always have difficulties with feeding myself	0.0330	0.3680	-0.4193
I always have difficulties with taking a bath or shower	-0.1223	**0.4249**	-0.2752
I always have difficulties while dressing	-0.0025	**0.4288**	-0.4023
I have been with body pain in the past one month	-0.0276	**0.4417**	0.1816
I have experienced pain around the joints in past 3 months	-0.0899	**0.5809**	0.1218
I easily get tired even when I have not done much work	-0.1049	**0.5031**	0.1418
I do not have enough energy for everyday life	-0.1473	**0.4193**	0.0977
I always have difficulties in sleeping	0.0081	**0.5644**	0.0065
Intimacy			
I have opportunities to love other people	0.0885	0.0618	**0.6107**
I am loved by other people around me	0.0635	0.0811	**0.7105**
I live happily with my family members	-0.0593	0.0057	**0.6169**
I engage in sexual relations	0.1988	-0.1723	-0.1497

Distribution of older persons by their physical health

Table 3 presents chi-square test results for the association between physical health and selected demographic, socio-economic and social support factors. Living arrangement, financial support, HIV sero status and distance to the nearest health facility were not significantly associated with physical health. The results show that the prevalence of self-reported poor physical health among older persons was highest among the oldest old age 80+ (61%; $p < 0.001$), women (36%; $p=0.007$), those living in central region (37%; $p<0.001$), those with no formal education (40%; $p<0.001$), widowed (40%; $p<0.001$) and those in in poorer wealth quintile (45%; $p<0.001$). Furthermore, self-reported poor physical health was highest among older persons whose children controlled their household assets (82%; $p<0.001$), those whose healthcare was derived from their children (42%; $p<0.001$) and not engaging in physical activity (57%; $p<0.001$).

Table 3 Percentages of older persons by selected factors affecting their physical health

Variable	Number (n=912)	Physical health			Pearson χ^2	*p-value*
		Poor (%)	Fair (%)	Good (%)		
Age						
60 - 69	462	22.3	36.6	41.1		
70 - 79	290	35.5	31.0	33.5	91.1	**<0.001**
80+	160	61.3	28.1	10.6		
Sex						
Male	395	29.3	31.9	38.7		
Female	517	36.4	34.4	29.2	9.8	**0.007**
Region						
Central	248	37.2	43.9	18.9		
East	237	30.4	27.9	41.7	49.0	**<0.001**
North	190	29.0	39.5	31.5		
West	237	35.9	22.8	41.3		
Education level						
No education	495	37.9	35.6	26.5		
Primary	363	30.0	30.9	39.1	35.6	**<0.001**
Secondary	31	9.7	38.7	51.6		

Tertiary	23	17.4	17.4	65.2		
Marital status						
Married	461	27.6	32.5	39.9	22.8	**<0.001**
Widowed	361	40.2	34.3	25.5		
Divorced	90	35.6	33.3	31.1		
Wealth index						
Poorest	293	43.3	32.8	23.9		
Poorer	73	45.2	31.5	23.3		
Middle	183	27.9	37.7	34.4	53.8	**<0.001**
Richer	206	27.2	37.9	34.9		
Richest	157	23.6	24.2	52.2		
Control over household assets						
Self	693	28.1	36.8	35.1		
Spouse	132	28.8	29.6	41.6		
Children	87	81.6	11.5	6.9	104.3	**<0.001**
Living arrangement						
Alone	80	36.3	37.5	26.2		
Spouse only	22	31.8	31.8	36.4		
Spouse & children	133	24.8	31.6	43.6	9.9	0.130
Children & grandchildren	677	34.7	33.2	32.1		
Financial/material support						
Yes	404	36.1	33.4	30.5	3.5	0.171
No	508	31.1	33.3	35.6		
Healthcare in sickness						
Spouse	308	20.1	32.5	47.4		
Children	377	42.2	31.6	26.2	58.8	**<0.001**
Grand children	91	32.9	45.1	22.0		
Others	136	38.9	32.4	28.7		
Distance to the nearest health center						
0 - 0.5 Km	170	33.5	29.4	37.1		
1 -2 Km	426	34.3	34.3	31.4	2.3	0.673
> 2 Km	309	32.7	34.6	32.7		
HIV/AIDS						
Positive	28	21.4	42.9	35.7		
Negative	854	34.3	33.0	32.7	2.2	0.334
Do physical activities						
Yes	678	25.1	37.0	37.9		
No	233	57.0	22.8	20.2	80.3	**<0.001**

p=Pearson χ^2 *test*

Multivariate results of factors associated with physical health of older persons

Results of the ordered logistic regression model of factors associated with physical health of older persons are presented in Table 4. The results show that the odds of good versus fair and poor physical health reduced with advancement in age. Compared to ages 60-69, the likelihood of having poor physical health was higher among older persons age 80 years and older (OR=0.345; p**<**0.001**)**. The findings also show that male older persons had increased odds (OR=1.515; p=0.036) of having good physical health compared to their female counterparts. Living in eastern region was associated with

good physical health (OR=2.334; p<0.001) compared to living in the central region. The Results further indicate that older persons in the middle wealth quintile had increased odds (OR=1.984; p=0.003) of good physical health, rich (OR=1.688; p=0.010) and richest (OR=2.109; p=0.004) compared to their counterparts in poorest wealth quintile. Similarly, compared to the older persons whose household assets were controlled by their children, those who controlled their household assets were more likely to have good physical health (OR=3.590; p<0.001) and spouse (OR=4.471; p<0.001). Table 3 also shows that older persons whose healthcare support was derived from their children were more likely to have poor physical health (0.537; p=0.008) compared to those who obtained healthcare support from their spouses. Older persons who engaged in physical activity were two times (OR=2.282; p=<0.001) more likely to have good physical health relative to those who were not.

Table 4. Results of ordered logistic regression of the predictors of physical health of older persons

Variable	Odds ratio	Standard error	*p-value*
Age			
60 – 69*	1.000		
70 – 79	0.723	0.125	0.061
80+	0.365	0.084	**<0.001**
Sex			
Male	1.515	0.300	**0.036**
Female*	1.000		
Region			
Central*	1.000		
East	2.334	0.475	**<0.001**
North	1.308	0.293	0.230
West	1.338	0.306	0.202
Education level			
No education*	1.000		
Primary	0.874	0.151	0.436
Secondary	1.624	0.748	0.292
Tertiary	1.904	1.097	0.264
Marital status			
Married	0.615	0.187	0.110
Widowed	1.052	0.266	0.842
Divorced/separated*	1.000		
Wealth index			
Poorest*	1.000		
Poorer	0.935	0.272	0.817
Middle	1.984	0.452	**0.003**

Richer	1.688	0.344	**0.010**
Richest	2.109	0.549	**0.004**
Control over household assets			
Self	3.590	1.254	**<0.001**
Spouse	4.471	1.902	**<0.001**
Children*	1.000		
Living arrangement			
Alone*	1.000		
Spouse only	1.351	0.864	0.638
Spouse & Children	1.027	0.389	0.945
Children and Grandchildren	0.934	0.262	0.808
Financial/material support			
Yes	0.851	0.128	0.280
No*	1.000		
Support in healthcare			
Spouse*	1.000		
Children	0.537	0.126	**0.008**
Grandchildren	0.689	0.206	0.213
Others	0.788	0.266	0.480
Has HIV/AIDS			
Yes	1.085	0.454	0.846
No*	1.000		
Do physical activity			
Yes	2.282	0.473	**<0.001**
No*	1.000		

**Reference category*

Discussion

The findings show that advanced age is significantly associated with deterioration of physical health of older persons. This poor physical health among older persons could perhaps be as a result comorbidities characterized by non-communicable diseases, vulnerability to communicable diseases and disabilities which increase with advancement in age. This finding aligns with findings of studies conducted in different parts of the world for instance, in Tanzania [26], South Africa [27], Brazil [28], England [29], Sweden [30] and other countries [31-35]. Advancement in age leads to degeneration of body functional systems, frailty, frequent falls and functional complications that results into inability to perform activities of daily living such as bathing, toileting, eating and walking.

This study found that sex was associated with physical health of older persons where male older persons were more likely to have good physical health compared to older females. In conformity with this finding, research has shown that older women experience physiological challenges such as post-menopausal deficiency which result in a host of health challenges such as osteoporosis [36]. In addition, falls are more common among women than men [27, 28]. It could also be attributed to gender imbalances in access to and control over socio-economic resources where men are more advantaged than women [31, 37, 38].

The findings show that older persons living in the eastern region of the country were more likely to have good physical health compared to central region. Regional disparities in later life physical health could be attributed to cultural and life styles differences especially in diet and physical activities as well as disparities in the affordability and accessibility to the health services and healthcare support. This finding is in consonance with other studies which show that the environment or context within which OPs live affects their health [39-42].

Older persons who were in the middle, richer and the richest wealth index quintiles were more likely to have good physical health. This finding aligns with previous studies in Uganda [16, 42], Canada and Norway [43] and other countries [26, 37, 44-50] which found that older persons from households with high socio-economic status had better physical health.

Older persons whose household assets were under their control or their spouses' were more likely to have good physical health. This finding aligns with previous studies in Turkey [51], China [45, 52] and other countries [31, 53] which indicate that older persons who possess assets are more likely to get better medical treatment when they are sick.

Older persons whose health care was supported by their children had poor physical health compared to those supported by their spouses. This is so perhaps because the spouses are the most trusted source of their healthcare support in times of sickness compared to children who grow up and often leave home very often. This finding is in consonance with previous studies which show that co-residence is currently rare thus making it difficult for children to provide quality care to their parents [54, 55]. Our findings show that even with co-residence, support by children is not superior to spouses'. Other studies show that low healthcare support to the older persons by children results from family disruptions such as increasing rate of nuclear families, education and rural-urban migration where children choose to live far away from their ageing parents with limited support [8, 13, 18, 55-57].

The results indicate that physical activity was associated with good physical health among older persons. In agreement with the previous studies physical activity strengthens health status of older persons through decreased falls and morbidity [58-62].

Conclusions

Physical health was positively associated with

Engaging in physical activity. Older persons who engaged in physical activity were more likely to have good physical health compared to those who were not. In addition, older persons' control of household assets was positively associated with good physical. On other hand, being of advanced age (80 years and above) was associated with poor physical health among older persons. These findings have various policy implications, including creating an enabling environment and building capacities of older persons to remain in control of their household assets. Interventions focusing on sensitization of older persons about importance of physical exercises could be a viable strategy for improving physical health of older persons.

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Competing interests

The authors declare that they have no competing interests.

Data availability

All relevant data are within the paper and its Supporting Information files.

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