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Health-related quality of life and co-morbidities among older adults in Bhutan

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ABSTRACT

Introduction: Health-related quality of life (HRQoL) is a multi-dimensional construct that assesses an individual's and group's perceived physical and mental health over time. Measurement of HRQoL is an important medical outcome study and its study among older adults in Bhutan is limited. **Methods:** This is a cross-sectional study aimed to assess HRQoL and its socio-demographic and health correlates, among older adults in Bhutan. Data for this study was collected from the four major towns of Thimphu, Phuntsholing, Gelephu, and Samdrupjongkhar, Bhutan, from November 2014 - February 2015, using structured questionnaire with face-to-face interview. A total of 337 Bhutanese older adults participated in this study. Statistical analysis was performed using statistical package for social science version 21.0. **Results:** The overall mean score for the HRQoL among older adults in this study was 0.67 (SD: 0.13) significantly different between the gender (p-value<0.001). A significantly low scores in the areas of role limitations (p<0.05), pain (p<0.01), mental health (p<0.001), and vitality (p<0.05) of the HRQoL was observed for the female gender. Frequent back pain (67.1%), memory decline (60.5%), depression (46.0%) mobility impairment (45.4%), insomnia (42.1%), and problem affecting breathing (31.8%) were common health problems and were significantly higher among the female gender. Better health conditions was positively related with better HRQoL (p-value<0.001). **Conclusions:** Low HRQoL was reported higher among female gender and was linked to multiple and cumulative health morbidities. Members of the family, community and healthcare providers could incorporate holistic approach to foster positive health outcomes and HRQoL of the older adults.

Keywords: Bhutan; Health conditions; Health-related quality of life.

INTRODUCTION

The use of term "quality of life" first became prominent after World War II[1]. However, till date there is no general consensus on a single definition of QoL[2] but has been defined in multiple ways meaning different things to different people. It is a multidimensional and multifaceted concept with no clear or fixed boundaries, and is based on the belief that people recognize what is important to them[3]. Understanding the concept of QoL is culturally dependent, since culture has a big influence on the variations in the perceptions of "health and sickness, interpretations of symptoms, the meaning of QoL and expectations of care"[4]. When the definitions and measures of QoL include self-reported physical and mental health, it is known as the health-related quality of life[5].

A number of demographic characteristics were found to influence HRQoL[6]. Age negatively affects HRQoL mostly due to decline in the physical health[7]. Older adults manifest progressive generalised impairment of function, loss of adaptive response to stress, and age-related diseases[8]. Gender appears to have influence on QoL, but the direction and magnitude of its effect is variable. Men generally tend to report better QoL[9], while worse HRQoL has been widely observed among women. However, it is still unclear if this is due to differential reporting patterns, or whether there is a real difference in the health status between gender[10]. Evidence supports that being married is significantly associated with better QoL[11]. It may be partly because married people are more likely to enjoy supportive, intimate relationships and less likely to suffer from being lonely[12]. High levels of education is presumed to promote better health and HRQoL[13]. Researchers believe that a well-educated older person has better knowledge about disease prevention, and therefore adopt healthier lifestyle leading to better QoL[14]. The significance of socio-economic status (SES) for wellbeing in later life is unclear. However, studies among older adults have demonstrated strong relationship between economic hardship and low HRQoL[6,15]. Older adults with low SES had 3.4 times higher odds of being in the worst QoL quintile (95%CI: 2.73-4.11) compared to people with high SES and high education[16].

HRQoL in old age is affected by the presence of co-morbidity[17]. Older people tend to report problems such as memory decline, dizziness, urinary incontinence, pain, mobility impairment, a history of fall, bone diseases, hypertension, shortness of breath during activities, fatigue, sleep problems and

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Figure 1. Map of Bhutan showing the study sites: Thimphu, Phuntsholing under Chukha, Gelephu under Sarpang, and Samdrupjongkhar

being more worried or nervous[18] and they significantly predicts low HRQoL[19]. According to a systematic review and meta-analysis by Cole, Dendukuri[20], being old, single, female, living with disability, having poor health status or poor self-perceived health conditions, were identified as the significant risk factors for depression among older adults. The main consequences of multi-morbidity are the disability and functional deterioration, poor QoL, and high healthcare costs[21]. On the contrary, a high QoL score is said to be achieved if older people have fewer diseases, little pain, and ability to perform activities of daily living independently[22]. Undeniably, older adults with chronic disease(s) suffer poor QoL which will be worth studying. Successful ageing is not only about maintenance of health, but also about maximising one's psychological resources[23].

Up to date, there has been no systematic study conducted to assess HRQoL and its correlates among older adults in Bhutan. To address these gaps, this study was undertaken to assess HRQoL and its difference between the genders and also to verify the socio-demographic and health correlates of HRQoL among older adults in Bhutan. Findings from the study are believed to assist in laying baseline information about HRQoL on which the future researches can be compared. It is also envisaged to inform family, community, and healthcare providers about the status of health and HRQoL of older adults, so as to help improve their health conditions, promote HRQoL and wellbeing.

METHODS

Study design and sites

This study implemented descriptive and analytical cross-sectional design. The study was conducted in the four major towns of Bhutan (Thimphu, Phuntsholing, Gelephu, and Samdrupjongkhar) from November 2014 – February 2015.

Ethical considerations

This study was conducted after obtaining Ethical Clearance from the Research Ethic Board of Health of the Ministry of Health, Bhutan (REBH/Approval/2011/013 Amendment #1 and version No. 9). Administrative clearance was sought from the Ministry of Home and Cultural Affairs (NGHA/ADM-15/2013-1093 & CHA/PPD (Mise-01)/2014/31), Thimphu, Bhutan, prior to the commencement of data collection.

Study population, sample size and data collection methods

Study population

A total of 337 (male=189, female=148) Bhutanese older adults aged sixty years and above living in the study sites participated in this study.

Sample size estimation

As there were no prior measurement of QoL among older adults in Bhutan on which the calculation of the sample size could be based, the sample size estimation for this study was therefore based on the number of predictors incorporated in the study. Twenty five variables were included in the study, and using this, the sample was approximated to be 300. Estimating 10% non-response rate, the final sample size was calculated to be 330. In the process of completing the survey, seven more older adults completed the interview. Hence the final sample for this study was 337.

Data collection techniques

Six final year nursing students from the Faculty of Nursing and Public Health of the Khesar Gyalpo University of Medical Sciences of Bhutan were recruited as research assistants (RAs) to collect the data. The principal researcher also participated in completing the data collection. During data collection, every effort

was made to ensure participants felt comfortable. Each interview included brief session to explain the aims and objectives of the study, information to obtain consent, right to non-participation, maintenance of anonymity in any forms of publication.

Instrumentation

Survey instrument included information on socio-demographic characteristics, checklist of physical health conditions, and mental health. Because of its brevity, low administrative and respondent's burden, short form six dimensions (SF-6D) was applied to measure HRQoL in this study. SF-6D is derived from short form 36 and comprises six multi-level dimensions of health: physical functioning (range: 1-6), role limitations (range: 1-4), social functioning (range: 1-5), pain (range: 1-6), mental health (range: 1-5), and vitality (range: 1-5). Each dimension has a different Likert scale. The purpose of the SF-6D is to provide ratings of an individual's HRQoL across all health conditions. The scoring system applied was based on the algorithm developed in the United States (Sf6d_sf36v1_US_mod.SPS) with a total score range between zero to one. Zero indicated poorest and one indicated best HRQoL[24]. The use of SF-6D was shown to be reliable, feasible, and valid in measuring the six-dimensions of HRQoL studies conducted in Europe, Asia, Australia, and South America. Pilot testing indicated good internal consistency with the calculated Cronbach's alpha coefficient of 0.85.

Data management

A coding manual was developed. Data was entered through the use of EpiData version 3.1 and was transferred to the statistical package for social science version 21 for analysis. Data entered was checked to ensure the presence of double-ups in the identification number. The frequency distributions of all variables were generated to check for the invalid response and degree of missing data. Descriptive statistics such as count and percentage, mean and standard deviation, and range were used to describe data. For the inferential statistics, chi-square, independent t-test, one-way ANOVA were applied to determine the relationships between the outcome and the independent variables. For the ANOVA test, post hoc test was run with Tukey to confirm difference between the groups.

RESULTS

Characteristics of the sample population

Socio-demographic characteristics are presented in Table 1. The sample consisted of 189 (56.1%) older males and 148 (43.9%) older females. Their ages ranged between 60 and 101 years (Mean=71.5, SD=7.66), with more than three-quarters (81.6%) of the sample between the ages of 60 and 79 years. Slightly more than half (53.1%) of the participants were married. The education level was very low overall, with nearly all of the women (97%)

Table 1. Socio-demographic characteristics of the sample by gender (*n*=337)

Socio-demographic characteristics	Male	Female	Total	*p*-value
	n (%)	n (%)	n (%)	
Age (Mean±SD:71.51±7.66)				
60-69 years	74 (39.2)	69 (46.6)	143 (42.4)	0.360
70-79 years	77 (40.7)	55 (37.2)	132 (39.2)	
≥ 80 years	38 (20.1)	24 (16.2)	62 (18.4)	
Marital status				
Married	114 (60.3)	65 (43.9)	179 (53.1)	0.006*
Not married	15 (7.9)	11 (7.4)	26 (7.8)	
Widowed	60 (31.7)	72 (48.6)	132 (39.2)	
Religion				
Buddhism	169 (89.4)	135 (91.2)	304 (90.2)	0.581
Not Buddhist	20 (10.6)	13 (8.8)	33 (9.8)	
Education level				
No formal schooling	142 (75.1)	143 (96.6)	285 (84.6)	0.000†
Some form of schooling	47 (24.9)	5 (3.4)	52 (15.4)	
Work status in the last 12 months				
Employed	91 (48.1)	64 (43.2)	155 (46.0)	0.129
Home maker	22 (11.6)	29 (19.6)	51 (15.1)	
Unemployed	76 (40.2)	55 (37.2)	131 (38.9)	

Note: SD=Standard deviation

**p-value<0.01*

†*p-value<0.001*

Table 2. Distribution of health-related quality of life by gender (*n*=337)

Health-related quality of life components	Male	Female	Total	*p*-value
	n (%)	n (%)	n (%)	
SF-6D Physical functioning (PF)				0.226
-Does limit a lot in bathing and dressing	7 (3.7)	7 (4.7)	14 (4.2)	
-Does limit a little in bathing and dressing	26 (13.8)	24 (16.2)	50 (14.8)	
-Does limit a lot in moderate activities	37 (19.6)	38 (25.7)	75 (22.3)	
-Does limit a little in moderate activities	52 (27.5)	39 (26.4)	91 (27.0)	
-Does limit a little in vigorous activities	35 (18.5)	28 (18.9)	63 (18.7)	
-Does not limit in vigorous activities	32 (16.9)	12 (8.1)	44 (13.1)	
SF-6:Physical functioning (PF)	3.94±1.40	3.63±1.31	3.80±1.37	0.036‡
SF-6D Role limitation (RL)				0.007§
- Limited in the kind of work as a result of physical health and accomplish less due to emotional problems	16 (8.5)	18 (12.2)	34 (10.1)	
- Limited in a kind of work or other activities as a result of physical health	123 (65.1)	111 (75.0)	234 (69.4)	
- No problem	50 (26.5)	19 (12.8)	69 (20.5)	
SF-6D: Role limitation (RL)	3.10±0.76	2.91±0.73	2.91±0.73	0.022‡
SF-6D Social functioning (SF)				0.555
-Limits all the time	17 (9.0)	15 (10.1)	32 (9.5)	
-Limits most of the time	47 (24.9)	39 (26.4)	86 (25.5)	
-Limits some of the time	43 (22.8)	39 (26.4)	82 (24.3)	
-Limits little of the time	51 (27.0)	40 (27.0)	91 (27.0)	
-Limits none of the time	31 (16.4)	15 (10.1)	46 (13.6)	
SF-6D: Social functioning (SF)	3.17±1.23	3.01±1.16	3.10±1.20	0.219
SF-6D Pain				0.011‡
-Have pain that interferes with normal work excessively	9 (4.8)	11 (7.4)	20 (5.9)	
-Have pain that interferes with normal work quite a bit	20 (10.6)	19 (12.8)	39 (11.6)	
-Have moderate pain that interferes with normal work	15 (7.9)	22 (14.9)	37 (11.0)	
-Have pain little bit that interferes with normal work	41 (21.7)	44 (29.7)	85 (25.2)	
-Have pain but does not interfere with normal work	48 (25.4)	28 (18.9)	76 (22.6)	
-No pain	56 (29.6)	24 (16.2)	80 (23.7)	
SF-6D: Pain	4.41±1.49	3.89±1.47	4.18±1.50	0.001§
SF-6D Mental health (MH)				0.000**
-Feel tense or downhearted all of the time	2 (1.1)	2 (1.4)	4 (1.2)	
-Feel tense or downhearted most of the time	18 (9.5)	14 (9.5)	32 (9.5)	
-Feel tense or downhearted some of the time	44 (23.3)	61 (41.2)	105 (31.2)	
-Feel tense or downhearted a little of the time	49 (25.9)	43 (29.1)	92 (27.3)	
-Feel tense or downhearted none of the time	76 (40.2)	28 (18.9)	104 (30.9)	
SF-6D:Mental health (MH)	3.95±1.06	3.55±0.95	3.77±1.03	0.000**
SF-6D Vitality				0.010
-Have a lot of energy none of the time	8 (4.2)	4 (2.7)	12 (3.6)	
-Have a lot of energy a little of the time	76 (40.2)	80 (54.1)	156 (46.3)	
-Have a lot of energy some of the time	47 (24.9)	41 (27.7)	88 (26.1)	
-Have a lot of energy most of the time	50 (26.5)	22 (14.9)	72 (21.4)	
-Have a lot of energy all of the time	8 (4.2)	1 (0.7)	9 (2.7)	
SF-6D:Vitality	2.86±1.00	2.57±0.80	2.73±0.93	0.003§
Total SF-6D score	0.69±0.13	0.64±0.11	0.67±0.13	0.000§

*Note: n= Number of participants; ‡p-value<0.05; §p-value<0.01; **p-value<0.001*

Scale range for physical functioning is (1-6), role limitation (1-4), social functioning (1-5), pain (1-6), mental health (1-5), and vitality (1-5) to assess the degree of feeling of difficulty in daily activities.

Table 3. Prevalence of common health morbidities among older adults in Bhutan by gender

Health morbidities	Male (*n*=189)						Female (*n*=148)						Total (n=337)					
	Yes		No		Don't know		Yes		No		Don't know		Yes		No		Don't know	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Frequent back pain	114	60.3	74	39.2	1	0.5	112	75.7	35	23.6	1	0.7	226	67.1††	109	32.3	2	0.6
Memory decline	103	54.5	83	43.9	3	1.6	101	68.2	45	30.4	2	1.4	204	60.5‡‡	128)	38.0	5	1.5
Some type of arthritis	104	55.0	81	42.9	4	2.1	93	62.8	50	33.8	5	3.4	197	58.5	131	38.9	9	2.7
Visual impairment	103	54.5	83	43.9	3	1.6	88	59.5	59	39.9	1	0.7	191	56.7	142	42.1	4	1.2
Fatigue	87	46.0	99	52.4	3	1.6	83	56.1	64	43.2	1	0.7	170	50.4	163	48.4	4	1.2
Depression	77	40.7	110	58.2	2	1.1	78	52.7	69	46.6	1	0.7	155	46. 0‡‡	179	53.1	3	0.9
Mobility impairment	74	39.2	114	60.3	1	0.5	79	53.4	68	45.9	1	0.7	153	45.4††	182	54.0	2	0.6
Insomnia	69	36.5	119	63.0	1	0.5	73	49.3	74	50.0	1	0.7	142	42.1‡‡	193	57.3	2	0.6
High BP	69	36.5	71	37.6	49	25.9	66	44.6	50	33.8	32	21.6	135	40.1	121	35.9	81	24.0
Serious problem affecting breathing	55	29.1	127	67.2	7	3.7	52	35.1	94	63.5	2	1.4	107	31.8‡‡	221	65.6	9	2.7
Hearing problem	47	24.9	139	73.5	3	1.6	38	25.7	109	73.6	1	0.7	85	25.2	248	73.6	4	1.2
Stomach ulcers	33	17.5	136	72.0	20	10.6	38	25.7	102	68.9	8	5.4	71	21.1	238	70.6	28	8.3
Gout	26	13.8	157	83.1	6	3.2	28	18.9	118	79.7	2	1.4	54	16.0	275	81.6	8	2.4
Musculoskeletal disorders	25	13.2	162	85.7	2	1.1	21	14.2	125	84.5	2	1.4	46	13.6	287	85.2	4	1.2
Any other serious medical conditions	17	9.0	151	79.9	21	11.1	25	16.9	114	77.0	9	6.1	42	12.5	265)	78.6	30	8.9
Diabetes	21	11.1	130	68.8	38	20.1	13	8.8	101	68.2	34	23.0	34	10.1	231	68.5	72	21.4
Asthma	13	6.9	163	86.2	13	6.9	14	9.5	126	85.1	8	5.4	27	8.0	289	85.8	21	6.2
Skin problems	18	9.5	170	89.9	1	0.5	8	5.4	139	93.9	1	0.7	26	7.7	309	91.7	2	0.6
Heart disease	11	5.8	121	64.0	57	30.2	5	3.4	100	67.6	43	29.1	16	4.7	221	65.6	100	29.7
Liver problem	6	3.2	119	63.0	64	33.9	6	4.1	96	64.9	46	31.1	12	3.6	215	63.8	110	32.6
Tuberculosis	3	1.6	173	91.5	13	6.9	5	3.4	136	91.9	7	4.7	8	2.4	309	91.7	20	5.9
Stroke	1	0.5	153	81.0	35	18.5	5	3.4	120	81.1	23	15.5	6	1.8	273	81.0	58	17.2
Kidney disease	4	2.1	141	74.6	44	23.3	2	1.4	108	73.0	38	25.7	6	1.8	249	73.9	82	24.3
Any type of cancer	1	0.5	139	73.5	49	25.9	3	2.0	116	78.4	29	19.6	4	1.2	255	75.7	78	23.1

Note: n= Number of participants; ‡‡p-value<0.05; ††p-value<0.01

Table 4. Bivariate relationship between socio-demographic characteristics and HRQoL by gender (*n*=337)

Socio-demographic characteristics	Total	Health-related quality of life (Mean±SD)			*p*-value
		Male	Female	Total	
Age					
60-69 years	143	0.75±0.11	0.67±0.10	0.71±0.11	0.000§§
≥ 70 years	194	0.65±0.12	0.61±0.11	0.63±0.12	
Marital status					
[a]Married	179	0.71±0.13	0.65±0.11	0.69±0.13	0.001***
Not married	26	0.65±0.10	0.61±0.10	0.63±0.12	
Widowed	132	0.65±0.12	0.64±0.11	0.65±0.13[a**]	
Religion					
Buddhist	304	0.68±0.12	0.63±0.10	0.61±0.12	0.008***
Non-Buddhist	25	0.74±0.14	0.74±0.12	0.73±0.13	
Education level					
No formal schooling	285	0.67±0.12	0.64±0.11	0.66±0.12	0.000§§
Some form of schooling	52	0.76±0.13	0.63±0.14	0.75±0.13	
Number of children					
≤3 children	116	0.70±0.12	0.64±0.10	0.68±0.12	0.589
4-5 children	116	0.68±0.13	0.64±0.11	0.66±0.12	
>5 children	105	0.68±0.13	0.65±0.12	0.67±0.13	
Relationship with children					
Not good	78	0.63±0.13	0.59±0.11	0.61±0.12	0.000§§
Good	253	0.70±0.13	0.66±0.11	0.69±0.12	
Employment status					
[a]Employed	155	0.71±0.13	0.67±0.11	0.69±0.12	0.000§§
Home maker	51	0.71±0.15	0.70±0.10	0.70±0.12	
Unemployed	131	0.66±0.12	0.58±0.10	0.62±0.12[a***]	

Note: SD= Standard deviation; ****p-value<0.01;* §§*p-value<0.001;* [a] Reference group

Table 5. Associations between health conditions, health morbidities and HRQOL

Health conditions and health morbidities	Count	HRQoL score Mean±SD	*p*-value
General health conditions			
Poor	158	0.59±0.09	0.000§§
Good	106	0.69±0.09	
Excellent	73	0.80±0.10	
Problem with walking			
No	175	0.73±0.11	0.000§§
Yes	148	0.59±0.10	
Long term medication			
Yes	121	0.63±0.11	0.000§§
No-don't know	216	0.69±0.12	
Psychological distress level			
Low distress	297	0.68±0.12	0.000§§
High distress	40	0.57±0.11	
Frequent back pain			
No	109	0.75±0.11	0.000§§
Yes	226	0.63±0.11	
High blood pressure			
No	121	0.69±0.13	0.001***
Yes	135	0.64±0.11	
Visual impairment			
No	142	0.70±0.12	0.000§§
Yes	191	0.64±0.12	
Fatigue			
No	163	0.74±0.11	0.000§§
Yes	170	0.60±0.10	
Mobility impairment			
No	182	0.73±0.11	0.000§§
Yes	153	0.59±0.10	
Arthritis			
No	131	0.73±0.12	0.000§§
Yes	197	0.63±0.11	
Depression			
No	179	0.72±0.12	0.000§§
Yes	155	0.61±0.11	
Insomnia			
No	193	0.70±0.12	0.000§§
Yes	142	0.62±0.12	
Memory decline			
No	128	0.73±0.12	0.000§§
Yes	204	0.63±0.12	
Number of health problems			
[a]0-2	63	0.80±0.10	0.000§§
[b]3-5	92	0.72±0.10[a***]	
[c]6-8	79	0.64±0.10[a***]	
[d]9-11	76	0.58±0.10[a***]	
[e]≥12	27	0.54±0.10[a***]	

Note: ****p-value<0.01;* §§*p-value<0.001;* [a] Reference group; [bcde] Compared groups

with no formal education (p-value<0.001). Nearly half (46%) of the participants were currently employed.

Health-related quality of life and its distribution by gender

Table 2 shows the distribution of HRQoL items as well as the overall mean score and the mean scores of each of the domains by gender. The overall mean score for the HRQoL among older adults in Bhutan was 0.67 (SD: 0.13) indicating towards better side of HRQoL (range: 0-1). The HRQoL score for the male gender was significantly higher 0.69 (SD: 0.13) compared to female 0.64 (SD: 0.11) (p-value<0.001). Bivariate analysis also indicated significant differences in role limitation (p-value<0.01), pain (p-value<0.05), vitality (p-value<0.05), and mental health (p-value<0.001) between the genders. Females significantly recorded more problems with role limitation, pain, mental health, and vitality.

Prevalence of health morbidities

Table 3 displays the common health problems, from highest to lowest prevalence. The common health problems - such as frequent back pain (67.1%), memory decline (60.5%), depression (46.0%) mobility impairment (45.4%), insomnia (42.1%), and problem affecting breathing (31.8%) were significantly different between the genders. All of these significant health problems were reported higher among the older females. It was surprising to note that there were significant percent of older adults who still are not familiar with common health problems such as the high blood pressure (24.0%), diabetes (21.4%), heart disease (29.7%), liver problem (32.9%), kidney disease (24.3%) and cancer (23.1%).

Relationship between socio-demographic characteristics, health morbidities and HRQoL

As indicated in Table 4, HRQoL was significantly associated with number of socio-demographic characteristics. Age negatively influences HRQoL (p-value<0.001). Compared to widowed and older adults with no formal education, those currently married and with some form of education significantly self-reported higher HRQoL (p-value<0.001). Likewise, currently employed older adults reported better HRQoL (p-value<0.001). Although number of children is not significant, older adults who perceived having good relationship with children reported better HRQoL (p-value<0.001). It is surprising to note that being Buddhist negatively influences self-report of HRQoL (p-value<0.01). As demonstrated in Table 5, better HRQoL was linked with better health conditions (p-value<0.001), no problem with walking (p-value<0.001), and not on long term medication (p-value<0.001). The first ten common health morbidities were also tested for association with the HRQoL score. Compared to older adults suffering with different health morbidities, those without health problems reported better HRQoL score (p-value<0.001). Compared to older adults suffering from nil to two health problems, those suffering from more than or equal to three different types of health problems reported low HRQoL score (p-value<0.001).

DISCUSSION

The overall mean score for the HRQoL among older adults in Bhutan was 0.67 (SD: 0.13; range: 0-1) indicating on the better side of the HRQoL.

As observed in the previous studies, female gender reported poor HRQoL in this study[6,21]. Low scores observed among female older adults were in the areas of physical functioning, role limitations, pain, mental health, and vitality domains of HRQoL. As suggested by Orfila, Ferrer, Lamarca, Tebe, Domingo-Salvany, Alonso[10], poor health conditions reported more among female gender in this study could have contributed to poor self-report of HRQoL. Further, the high prevalence of widowhood and poor education level may have also fuelled self-report of poor health conditions and HRQoL. Although widowhood was observed to have negative influence on HRQoL, older adults in this study perceiving good relationship with children was found to report higher HRQoL. It is the indication that one of the main sources of social support from immediate family members remains crucial for the QoL of older adults. Therefore, in Bhutan, where extended family practice is cherished, the maintenance and sustenance of congenial and respectful relationship between older and younger generations is merited. Furthermore, as majority of the participants came from Buddhist background, health education infusing the philosophical stand of 'all compounded things are impermanent' and the acceptance of old age prone to multiple health conditions, and inevitable events such as greying and ultimately death widely talked in the Buddhist community can help mitigate its negative influence and promote better health outcomes for older adults. Already in consistent with findings from the past study[7], older age was found to be negatively related with HRQoL. However, it's surprising to observe that being Buddhist was negatively linked to HRQoL in this study. Bhutan is a Buddhist country and this finding deserves further exploration.

Older adults tending to report problems such as memory decline, pain, mobility impairment, shortness of breath, fatigue, and depression were consistent with findings of the past study[18]. However, the high percent of older adults still not knowing some of their common chronic health conditions such as high blood pressure, diabetes mellitus, liver and kidney problems in this study were not reported in other studies. Higher percent of not knowing their health condition is a concern and it may be an indication of poor health literacy. Poor health literacy could be possible given the high percent (84.6%) of participants with no formal schooling in this study. Health-care providers should be mindful to assess the health literacy of older people and provide holistic healthcare when reaching it to older population. As observed in the past studies[19,21,25], perceived poor health status, and complaints with multiple health morbidities were positively related with poor HRQoL. Healthcare providers could create public awareness

especially among older population to alleviate multiple health morbidities and promote their physical and mental wellbeing.

Limitations and strengths

Findings from this study cannot be generalised to the true population due to adoption of non-probability sampling technique. The recruitment of research assistants with health and nursing background might have been biased, and the number of "unknown" common health conditions reported by participants in this study is a concern. This study was the first of its kind to assess HRQoL and its correlates using systematic and scientific based approach. Further exploration of QoL is required as it may be different among the generations. Findings also suggest the need for improvement of health literacy among the older adults of Bhutan.

CONCLUSIONS

HRQoL was found to be correlated with age, gender, education level, employment, religion, presence of co-morbidities and health conditions.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

ND: concept, analysis of data, study design, manuscript drafting and critical reviews

MPD: concept, analysis of data, study design and revisions

CS: concept, analysis of data, study design and revisions

SD: concept, analysis of data, study design and revisions

Authors agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

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