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## Quality of Life and Health Needs among Elderly aged 60-79 years in Paro, Bhutan

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### ABSTRACT

**Introduction:** The global population is undergoing a significant demographic shift, with a rapidly increasing number of the elderly population. As people age, their health and quality of life become increasingly important considerations. The elderly population has unique health needs that must be addressed to ensure their well-being and maximize their quality of life. In Bhutan, elderly health needs are lacking despite the information on health policy and planning. This study was proposed to assess the quality of life and the health needs among the elderly aged between 60 – 79 years old under Naja, Dogar, Shaba, and Lyungni gewogs (blocks) under Paro district, Bhutan. **Methods:** An explanatory sequential mixed method design with a quantitative and descriptive qualitative was conducted in the four blocks. For the quantitative component, a survey was conducted and for the qualitative, focus group discussion was used. This study was carried out in four selected rural areas known as gewogs (blocks) in local language under Paro district. A representative sample of 403 respondents was selected by simple random sampling in quantitative work and 12 elderly people in focus group discussion. The demographic data were analyzed by ANOVA and data from focus group discussion were done in content analysis. **Results:** The quantitative data for the overall QoL score among the elderly showed a mean score of 39.01, which was considered a low level of QoL. Among the eight components of QoL, the role of pain and general health showed the same result level as the overall QoL. While the others (physical function, body pain, vitality, social function, role of emotion, and mental health) were at the average level (score 46.19-58.68). **Conclusions:** Overall QoL of the elderly people in the Paro district is lower than the average at 47.84 (CI 45.87 – 49.81). Mental health was in average level compared to physical health, which is at a lower level.

**Keywords:** Elderly; Geriatric; Health needs; Quality of life.

### INTRODUCTION

According to the World Health Organization (WHO), people aged 60 and above made up nearly 3-19% of the total world population in 2020<sup>1</sup>. This progressive increase in life expectancy contributes to the prevalence of chronic non-communicable diseases including mental illnesses<sup>2</sup>. In Bhutan, the life expectancy at birth was 66 years<sup>3</sup> in 2005 and increased to 70.20 years in 2022<sup>1</sup>. Similarly, every Asian country has experienced the highest increase in the elderly population and over 50 percent of the elderly in the world live in Asia<sup>2</sup>.

Bhutan is one of the developing countries witnessing a growing number of elderly due to better health, an increase in life expectancy, and a decline in the fertility rate<sup>1</sup>. Till recently, elderly people were protected by the culture of extended family and community unity. However, rapid change in demographic

patterns is affecting the informal care and support of elderly family members<sup>1</sup>.

According to the National Statistics Bureau (NSB), nearly 44319 of the total population was above 60 years of age in 2005, which increased to 58,804 (7.54% of the total population) in 2017<sup>1</sup>. In the past, elderly people were considered productive as they would perform usual work such as working in the field, taking care of their children, cattle herding and many more. With changing economic models, young people are migrating from rural to urban areas in search of better opportunities leaving elderly parents behind in the rural community<sup>3</sup> and possibly suffering from social isolation<sup>4</sup> and poor health conditions as most of them depended on remittance from children<sup>4</sup>.

The advancement in socio-economic change may gradually set a boundary to the traditional family care system and this may come with long-term implications. The demographic profile of Bhutan shows that the old-age dependency ratio is increasing while the informal care and support system for older adults is decreasing<sup>1</sup>. Thus, Quality of Life (QOL) has become an important area of concern for the health of the elderly, and need proper plans and strategies to improve their QOL<sup>5</sup>. Therefore,

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this study aims to examine the quality of life and identify the health needs of the elderly population in the rural community of Bhutan.

## METHODS

This was an exploratory sequential mixed method design with a quantitative and descriptive qualitative component.

### Quantitative component

The total population of elderly people aged 60-79 years in the Paro district was 3728 according to the National Statistical Bureau report 2017.<sup>1</sup> The sample size was calculated using the Taro Yamane formula<sup>6</sup> with a 95% Confidence Interval. A sample size of 403 was calculated based on the ratio of gender in elderly people and the sample collected are 170 male and 233 females.

### Data collection

Three bachelors in nursing and midwifery students were recruited and trained for a week as research assistant. The research assistants are fluent in Tshangla, Dzongkha, Lhotshamkha and English. Each interview included a brief session to explain the aims and objectives of the study, information to obtain consent, right to non-participation, maintenance of anonymity and provision of a list of support services available in case participant(s) suffered emotional distress as a result of participating in the study.

### Steps for quantitative data collection

- List of the elderly people of 4 selected villages block were obtained from Naja, Dogar, Shaba and Lungnyi, then sampling the number based on the proportion allocation technique.
- Interview was conducted in a private location where the conversation cannot be seen or heard by others or hold interviews in a convenient location, such as public place if privacy is maintained.
- Respondents were allowed someone else such as spouse or other family member during their interview.
- Interviewers provided necessary information on research project, including any issues/questions the participants had were addressed.
- Respondents were provided with written consent as well as verbal consent. It took 10-15 minutes to complete the questionnaires.

### Inclusion criteria

- All elderly Bhutanese, both men, and women aged between 60 to 79 years, living in the reachable districts of Paro, Bhutan.
- He or she can at least speak one of the following languages: Dzongkha, Lhosthamkha, or Tshanglo.
- They are in stable conditions at the time of data collection and willing to participate in the study.

### Study tool

The SF-36 is a renowned tool for measuring health-related QoL in adults<sup>7</sup>. The physical, social, and role functioning scale of SF-36 tries to capture behavioral dysfunction caused by health problems. Mental health, bodily pain, and general health try to reproduce more subjective components of health and general well-being. In addition, it was also found that the SF-36 distinguishes better among different levels of health status and utilization. Hence, it was suitable to define the SF-36 as an evaluator of health-related QoL, concentrating mostly on health-related functioning and perceptions.

### Translation and Validation (Expert Panel)

The questionnaire was adapted from the Boston Health Research Institute (BHRI) in the United States of America and contextualized to the Bhutanese setting. In physical functioning (PF01), vigorous activities such as lifting heavy objects were exemplified as lifting a bucket of water to improve the understandability of the question. In PF02, moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf were replaced by sweeping the floor, circumambulation of religious monuments, prostrations, and cooking, as these activities, can be considered equivalently moderate. Climbing several flights of stairs was replaced as climbing five floors (PF04), and one flight of stairs was explained as one floor (PF05). One mile was expressed as 1.5 km (PF07), walking several hundred yards was expressed as walking more than 500 steps (PF08), and walking one hundred yards was expressed as walking 100 steps (PF09). Words like dumps, downhearted and depressed MH02, and MH04 were translated suitably to capture their meaning.

The SF-36 questionnaires were translated by two bilingual individuals and these translators are native speakers of Dzongkha with excellent proficiency in English. Two individuals were Dzongkha lecturers at the Royal University of Bhutan. Once the translations were completed, inconsistencies between them were determined by a Dzongkha Development Commission Committee consisting of six members of the translation. The committee created one unified translation of the SF-36 translated into Dzongkha and further, the translated draft was reviewed by the scientific committee of the Research Ethics Board of Health (REBH) to assess the semantic equivalence of the translation in both English and Dzongkha. The pretesting study was conducted with the aim to fulfill: 1) The suitability of the survey questionnaire; 2) Feedback and suggestions for the improvement of the questionnaire. The information related to the research, including its aims and objectives, was provided to the participants.

### Study variables

The dependent variable, QoL is assessed through the Short Form-36 (SF36) health survey questionnaire which consists of two dimensions and eight components. Independent variables are selected based on the understanding of the literature and data available in the context of the quality of life of elderly people.

The determinants of independent variables are classified into four domains such as age, gender, marital status, and education were included in the questionnaire for the quantitative study design part.

**Summary of HRQoL questionnaires**

SF-36 is composed of two dimensions measuring health: Physical Dimension (PD) and Mental Dimension (MD). Each dimension consists of 4 components.

- PD which emphasizes daily activities including the movement of the body, and to evaluate the range of severity of physical limitations evaluates the role of an elderly individual. It assesses the intensity of body pain and to what extent the pain affect with normal work and concerned about their perception of individual health when compared to nearby people.
- MD measures the feeling of Vitality, ability in social functioning, emotional balance, and psychological well-being<sup>8</sup>.

**Scores and interpretation for SF36**

The score can be interpreted based on the percentage without any comparison to standard outsourcing. Therefore, the interpretation can be interpreted as:

- Poor Score 0-20
- Low Score 21-40
- Average/Fair Score 41-60
- Good Score 61-80
- Excellent Score 81-100

**Qualitative component**

Qualitative interviews explored the various facets of health and social needs associated with QOL. The data collection techniques utilized were focus group discussions (FGDs).

A focus group discussion was conducted in a community center with prior permission from the village headman discussion was scheduled on the 21<sup>st</sup> July of 2019 from 10:00 am to 11:30 am. The FGD had twelve elderly respondents from Naja, Dogar, Shaba, and Lyungni, three each from four villages with similar socio-economic backgrounds. The FGD was conducted exclusively among elderly men and women which comprised mixed genders. In the process of discussion, one of the research assistants helped with note-taking since he was good at note-taking. Before the FGD started, the objectives and informed consent were provided. All information emerging during the FGD was recorded and translated into text.

**Data analysis**

For the quantitative component, data were calculated and analyzed using the Statistical Package for Social Sciences (SPSS) version 18. Reports of QOL were scored as per the SF-36. A comparison of QoL and its eight components based on their mean scores was done against the independent variables such as age

group, marital status, and education through one-way ANOVA. The QoL mean scores against genders were compared by t-test. For all tests, a significance level of 0.05 with 95% CI was used. For the qualitative data, a manual content analysis was done. All the recordings were transcribed and translated into English. The research team read the transcripts and coded common ideas, categorized and grouped them into themes. Content analysis was done by two researchers to increase the trustworthiness of the results. Text written in an *Italic font* in the results signifies a direct quotation from the participants

**RESULTS**

**1. Quantitative component**

**a. Socio-demographic characteristics**

A total of 403 elderly people participated in the study, 233 elderly were females with the age range between 60 – 79 years. Over two hundred thirty-six (58 %) of them belong to the age group of 60 – 69 years. Two hundred eighty-six (71%) of the respondent were married.

**Table 1. Socio-demographic characteristics of the study participants for quality of life in the elderly population in Paro, 2019 (n=403)**

Variables	n	%
Age (years)		
60 – 69	237	58.8
70 – 79	166	41.2
Gender		
Male	170	42.2
Female	233	57.8
Marital status		
Never married	21	5.2
Married	286	71.0
Divorced	21	5.2
Widowed	75	18.6
Education		
No schooling	367	91.1
Primary education	20	5.0
Secondary education	14	3.4
Tertiary education	2	0.5

**b. Quality of life**

The mean score of overall QoL among the study participants was 47.84 (CI 45.87 – 49.81). It was observed that the mean of the physical dimension was lower than the mental dimension as indicated by the low level of the lower limit of the Physical dimension as shown in the table below.

**Table 2. Quality of life of elderly people in Paro, Bhutan in relation to Physical and Mental dimension in 2019 (n=403)**

Measurements /variable	*QOL	Physical dimension	Mental dimension
Mean	47.84	42.14	53.55
(95% CI <sup>†</sup> )	(45.87,49.81)	(39.89,44.39)	(51.64,55.46)

\*Quality of Life †Confidence Interval

**c. Description of eight components of SF-36**

a. Physical dimension (Components: Physical Function (PF), Role of Physical (RP), General Health (GH), and Body Pain (BP)) The physical dimension revealed low scores compared to those of the mental dimension. The mean score of General Health and Role of Physical (38.09 and 31, 80) falls on the lower level, and the other two components fell into the average level of scores. However, for the mental dimension, only the vitality component scored lower than 50, the other three components scores were at the average level as shown in Table 3.

**d. Associations of QoL with various factors**

There was statistical significance in overall QoL between age group, gender, marital status, and education.

**Age, gender, and education level**

The elderly aged 70-79 years were reported to have a poor overall quality of life (<0.001), lower physical wellbeing (0.001), and low level of mental wellbeing (0.01) compared to the 60-69 age

group. Elderly females were reported to have poor overall quality of life (0.001), lower physical wellbeing (<0.001), and lower level of mental wellbeing (0.01) compared to elderly males. Having a higher level of education was associated with good overall quality of life and physical well-being as shown in Table 4.

**2. Qualitative component**

To get a deeper understanding of the quality of life of the elderly population in the Paro district, a focus group discussion was conducted. The FGD lasted around 90 minutes with 12 respondents. The FGD generated diverse and meaningful perspectives. These perspectives were grouped under four themes to capture health and well-being.

**Table 3. The score of eight components of SF-36 among elderly population in Paro, Bhutan in 2019 (n=403)**

Variables	Mean	(95% CI <sup>†</sup> )
Physical functions	46.19	(43.47,48.91)
Role of physical	38.09	(34.1,42.04)4
Body pain	52.48	(49.72,55.24)
General Health	31.8	(29.8,33.74)6
Vitality	45.58	(44.20,46.96)
Social Function	58.68	(55.78,61.58)
Emotional balance	53.68	(49.81,57.55)
Mental Health	56.24	(54.65,57.83)

\*Confidence Interval

**Table 4. Comparison of QoL and its determinants to the independent variables among the elderly population in Paro, Bhutan in 2019 (n=403)**

Variables	N	Overall QoL*		Physical dimension		Mental dimension	
		Mean (SD <sup>†</sup> )	p-value	Mean (SD <sup>†</sup> )	p-value	Mean (SD <sup>†</sup> )	p-value
<b>Age group</b>							
60-69	237	50.86(18.69)		46.08 (21.81)		55.64 (18.08)	
70-79	166	43.53 (21.39)	<0.001	36.52 (23.57)	<0.001	50.55 (21.26)	0.01
<b>Gender</b>							
Male	170	51.79 (21.20)		47.58 (23.83)		55.10 (20.48)	
Female	233	44.96 (18.87)	0.001	38.17 (21.60)	<0.001	51.76 (18.75)	0.032
<b>Marital status</b>							
Never married	21	52.48 (22.13)		48.09 (24.88)		56.87 (21.47)	
Married	286	49.09 (19.71)		43.48 (22.60)		54.71 (19.32)	
Divorced	21	45.99 (20.05)	0.043	39.61 (23.05)	0.048	52.38 (19.51)	0.84
Widowed	75	42.29 (20.58)		36.06 (23.30)		48.52 (19.62)	
<b>Education level</b>							
No schooling	367	47.31 (20.07)		41.34 (22.71)		53.28 (19.69)	
Primary	20	45.49 (19.51)		39.91 (22.63)		51.08 (19.28)	
Secondary	14	62.61 (18.79)	0.02	62.94 (22.97)	0.002	62.28 (16.80)	0.255
Tertiary	2	66.28 (8.97)		65.94 (8.40)		66.62 (9.54)	

\*Quality of Life, †Standard deviation



## **Theme 01: An emergency referral system**

The common barrier to accessing medical care services was the absence of reliable transport to health centers during routine checkups as well as emergency situations. The respondent shared that the lack of such services leads to delay and discontinuity of care. Thus, transportation services as well as an effective logistics system should be planned and managed to assist those in need to access quality services in cases of emergencies, at night time, and during the weekend.

*“My children are living in different parts of the country; my worry is that when I and my husband get sick it is difficult to manage transportation to see a doctor on time. Therefore, we need to have an efficient ambulance service to visit the hospital.”* - (Female, 70 years, married)

## **Theme 02: Special care and services for older adults**

They recommended several strategies to address the barriers to medical accessibility, either community-based or hospital-based levels as reflected below.

### **Subtheme 2.1: Geriatric clinic**

Health care and service for elderly people has different component compared to the other patient group. As per the respondent, categorizing elderly care and services as the same group as general patients and treating them with common health diagnoses is not effective in treating them. While there are priority counter services available in health facilities, it overlooks factors like user-friendly navigation services, language barriers, and addressing the lack of specialization in elderly care. A recommendation for comprehensive priority services such as expediting laboratory tests was discussed.

*“After waiting in queue for hours, finally they tell us, it’s a disease of old age. Therefore, need to have a specialized health professional in the community health care facility to look after the older adults.”* - (Male, 63 years, married)

*“I am a diabetic patient and I undergo a blood test every three months. During the test, I am supposed to fast overnight but I find it very difficult! I have to wait in the queue and by the time my turn arrives, I feel weak, fatigued, and hungry!”*

### **Subtheme 2.2- “Out of hour clinics”**

The elderly people need either an hour’s service or health services during the weekend, as one advocate noted.

*“The community health facilities need to be open during holidays because we never know when older people will become sick and need to attend on-call duties during the odd hours whenever the older people are sick at their home”*- (Male, 71 years, married)

### **Subtheme 2.3 - Long-term health monitoring**

One of the themes was the need for comprehensive health services

such as health screening programs, health promotion, and health education at a community level, instead of only hospitals. The participants shared how such an initiative can benefit not only themselves but to the younger generation and community members for a healthy community.

*“For the benefit of the older people, we love to have three monthly screening programs on non-communicable disease and measures such as improvement in the health knowledge of the older people about potential risk factors in their community”* - (Male, 69 years, divorced)

## **Theme 3. Family and community engagement**

Family is an essential component of everyone’s life, including elderly people. The respondents shared how the changing time has resulted in drastic transitions in the approach to elderly care. In the past, elderly care was the responsibility of family members. Today, elderly people are mainly alone at home or resettles in a new place to live with their children in the cities, or nursing homes. Participants highlighted the need for the feeling of social security through the involvement of the community and social members. It will result in the feeling of connectedness to peers, neighbors, or community members, create more sense of mental well-being, and decrease social isolation

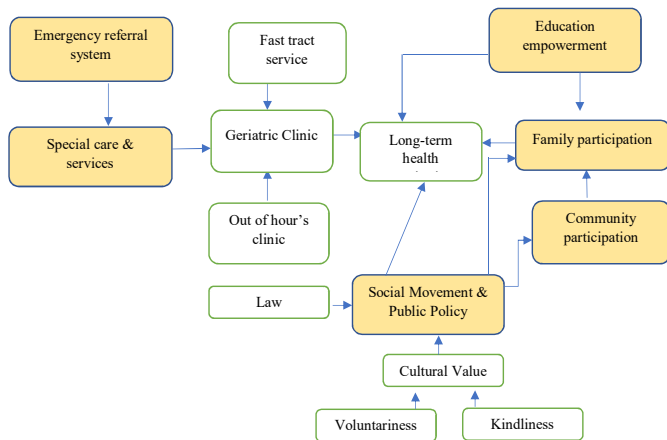
*“My children are living far away for their own work and to support their own children. They contact through phone and sometimes they do visit and stay for a while and go back to their own destination. But I prefer them to stay with us and look after the welfare all the time.”* - (Female, 71 years, married)

*“I personally feel that elderly people who don’t have their own children are suffering more and end up with depression as I can see in the community. Therefore, the community needs to collaborate with the stakeholders for the ways and means to look after these elderly people.”*- (Male, 67 years, widowed)

Additionally, it was emphasized that to increase social and health security, the social campaign of family involvement in elderly care, enforcement by law, and regulation might be useful and beneficial to them. Few of them mentioned integrating the cultural value of Bhutan into health care services, especially voluntariness and kindness as a step towards social support.

*“My worry is that in the future our children might not look after the welfare of their old parents, therefore, need to exercise certain rules and regulations to make it compulsory for the members of society to look after their aged parents.”* (Male, 66 years, married)

The overview framework related to the social and health needs of the key informants is demonstrated in the figure below.



**Figure 2. Conclusion framework of social and health need of Bhutanese elderly in Paro, Bhutan in 2019 (n=403)**

**DISCUSSION**

**Sociodemographic characteristic**

In this study, the QoL score in elderly people aged 60-69 years was higher as compared to those age groups of 70-79 years. The result of this study findings are consistent with difference studies done in Turkish and Asian population<sup>9,10</sup>. As age progress, it will lower the score of QoL due to a high prevalence of comorbidities and these comorbidities will progress especially around the age between 60 to 70 years<sup>10</sup>. Aging alone will compromise the physical functionality, role of pain, body pain and social function<sup>11</sup>.

The finding of this study revealed that the QoL of elderly women was significantly poorer than elderly men in all four components of physical function dimension and mental component in mental dimension. This finding is consistent with those reported in other QoL studies<sup>9</sup>. The reason for the lower level of QoL in elderly women may be due to a high incidence of symptoms related to anxiety and depression<sup>11</sup>. In our study, women are more prone to physical disability and role limitation which leads to lower score on the subscale of physical component summary. Studies show that elderly women suffer from a high rate of psychological illnesses as compared to elderly men<sup>11</sup> due to culture norms which often results in limited outdoor exposure and financial barrier

The research shows married elderly scored below average in QoL and physical dimension. One of the factor contributing to it includes quality of the marriage life. In contrary to the present study, many studies reported that married elderly had better QoL than elderly who never married, got divorced and separated<sup>12,13</sup>. A better QoL was associated with higher level of education as compared to the primary level and no schooling, which was similar to findings from other studies conducted in India<sup>13-15</sup>.

**Quantitative component**

The overall QoL mean score was 47.84 indicating the average

level, a pattern that is similar to other studies<sup>16,17</sup>. Study reported that the difference in QoL is due to 1) the complexity of the aging process and 2) contributed by many factors that affect the relationship from one to another<sup>18</sup>. Additionally, factors such as economic stability, cultural background, education level, and health condition can also affect the QoL. Among the eight components, general health was scored low compared to the rest of the seven components which was different from the study done in Iran<sup>19</sup>. The difference might be due to the lack of elderly-centered services in Bhutan such as nursing homes, elderly clinics, and insurance.

**Health needs and social support**

For elderly people, the place of residence is the main area for fulfilling their needs. The most important is the emergency referral system and geriatric care facilities within the locality, family participation in elderly care, and community participation to support other people<sup>21</sup>. While priority services for the elderly are available in all the health facilities, people are not adhering to them. Hence, an awareness targeted at the public is needed. In terms of issues related to the unavailability of medications in PHCs, the SCCI (Service with Care and Compassion Initiative), which will soon be implemented in the Paro district will most likely resolve this issue. For the medical care needs, the support from the family, and institution have a great impact on the life satisfaction of elderly people. On the other hand, a lack of fulfilling these needs causes senility, feeling of rejection, and expulsion by society. Therefore, there is a need for the promotion of a new lifestyle that includes activities such as community groups, meditation, and yoga. Moreover, it must be supported by education for old age and strengthen the respect for old people.

**CONCLUSIONS**

The finding from this study can be concluded that the quality of life decreases with age. The QoL among the elderly female was lower compared to their male counterparts and some of the major factor contributing to this includes the high incidence of symptoms related to anxiety and depression. The QoL among married elderly are better than divorced and widow.

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**REFERENCES**

1. Dorji L, Jamtsho C, Norbu T, Bhujel GD. Understanding the situation of elderly citizens in Bhutan. Thimpu: National Statistics Bureau; 2017. 332 p. [Full Text]

2. He W, Goodkind D, Kowal PR. An aging world: 2015. Washington, DC: United States Census Bureau; 2016. 165 p. [[Full Text](#)]
3. He C, Ye J. Lonely sunsets: impacts of rural–urban migration on the left-behind elderly in rural China. *Population, Space and Place*. 2014;20(4):352-69. [[Full Text](#) | [DOI](#)]
4. Connelly R, Maurer-Fazio M. Left behind, at-risk, and vulnerable elders in rural China. *China Economic Review*. 2016;37:140-53. [[Full Text](#) | [DOI](#)]
5. Qadri S, Ahluwalia SK, Ganai A, Bali S, Wani F, Bashir H. An epidemiological study on quality of life among rural elderly population of northern India. *International Journal of Medical Science and Public Health*. 2013 Feb 12;2(3):514-22. [[Full Text](#) | [DOI](#)]
6. Yamane T. *Statistics: An introduction analysis*. 2nd ed. New York: Harper & Row; 1967. 919 p. [[Full Text](#)]
7. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Med Care*. 1992;30(6):473-83. [[PubMed](#) | [Full Text](#)]
8. Layte R, Sexton E, Savva G. Quality of life in older age: evidence from an Irish cohort study. *J Am Geriatr Soc*. 2013 May;61 Suppl 2:S299-305. [[PubMed](#) | [Full Text](#) | [DOI](#)]
9. Ordu Gokkaya NK, Gokce-Kutsal Y, Borman P, Ceceli E, Dogan A, Eyigor S, et al. Pain and quality of life (QoL) in elderly: the Turkish experience. *Arch Gerontol Geriatr*. 2012 Sep-Oct;55(2):357-62. [[PubMed](#) | [DOI](#)]
10. Hajian-Tilaki K, Heidari B, Firouzjahi A, Bagherzadeh M, Hajian-Tilaki A, Halalkhor S. Prevalence of metabolic syndrome and the association with socio-demographic characteristics and physical activity in urban population of Iranian adults: a population-based study. *Diabetes Metab Syndr*. 2014 Jul-Sep;8(3):170-6. [[Full Text](#) | [DOI](#)]
11. Ahmadvand A, Sepehrmanesh Z, Ghoreishi FS, Afshinmajd S. Prevalence of psychiatric disorders in the general population of Kashan, Iran. *Arch Iran Med*. 2012 Apr;15(4):205-9. [[PubMed](#) | [Full Text](#)]
12. Kahneman D, Diener E, Schwarz N. *Well-being: Foundations of hedonic psychology*. New York: Russell Sage Foundation; 1999 p. [[Full Text](#)]
13. Ghosh S, Bandyopadhyay S, Bhattacharya S, Misra R, Das S. Quality of life of older people in an urban slum of India. *Psychogeriatrics*. 2014 Dec;14(4):241-6. [[Full Text](#) | [DOI](#)]
14. Akyol Y, Durmus D, Dogan C, Bek Y, Canturk F. Quality of life and level of depressive symptoms in the geriatric population. *Arch Rheumatol*. 2010 Dec;25(4):165-73. [[Full Text](#) | [DOI](#)]
15. Naing MM, Nanthamongkolchai S, Munsawaengsub C. Quality of life of the elderly people in einme township irrawaddy division, Myanmar. *Asia Journal of Public Health*. 2010;1(2):4-10.
16. Akbar F, Kumar M, Das N, Chatterjee S, Mukhopadhyay S, Chakraborty M, et al. Quality of Life (QOL) Among Geriatric Population in Siliguri Sub-division of District Darjeeling, West Bengal *Nat J Res Com Med*. 2012;1(4):178-241. [[Full Text](#)]
17. Manasi SMD, Sarkar CDK. Quality of life (QOL) among geriatric population in Siliguri sub-division of district Darjeeling, West Bengal. [[Full Text](#)]
18. Dionigi RA. Stereotypes of aging: Their effects on the health of older adults. *Journal of Geriatrics*. 2015 Nov 12;2015:9. [[Full Text](#) | [DOI](#)]
19. Megari K. Quality of life in chronic disease patients. *Health Psychol Res*. 2013 Sep 23;1(3):e27. [[Full Text](#) | [DOI](#)]
20. Doosti-Irani A, Nedjat S, Cheraghi P, Cheraghi Z. Quality of life in Iranian elderly population using the SF-36 questionnaire: systematic review and meta-analysis. *East Mediterr Health J*. 2019 Jan 23;24(11):1088-97. [[Pub Med](#) | [DOI](#)]
21. Christensen K, Doblhammer G, Rau R, Vaupel JW. Ageing populations: the challenges ahead. *Lancet*. 2009 Oct 3;374(9696):1196-208. [[Pub Med](#) | [Full Text](#) | [DOI](#)]

## AUTHORS CONTRIBUTION

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

**GT:** Concept, design, data collection and analysis, manuscript writing and review.

**KT:** Data analysis, manuscript writing and review

**KO:** Design, data analysis, manuscript writing and review

**JP:** Concept, design, data collection and analysis, manuscript writing and review.

**KV:** Design, data analysis, manuscript writing and review

Author 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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