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Original Research Article

Association of Obesity, Hypertension, and Diabetes with Health-Related Quality of Life in the Elderly

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Abstract: ***Background*:** Health-Related Quality of Life (HRQoL) in the elderly is significantly impacted by chronic conditions like obesity, hypertension, and diabetes. ***Objectives:*** To assess the association of obesity, hypertension, and diabetes with HRQoL in elderly individuals and compare HRQoL scores across conditions. ***Method and Materials:*** This cross-sectional study was conducted at Jalalabad Ragib Rabeya Medical College Hospital, Sylhet, from June 2022 to May 2023. It included 286 elderly individuals aged 60 years and above, diagnosed with obesity, hypertension, and/or diabetes. Data were collected through structured interviews and medical record reviews, assessing HRQoL using validated tools. Statistical analysis was performed using SPSS, applying descriptive statistics, t-tests, ANOVA, and multivariable regression to identify HRQoL associations. ***Result:*** A total of 286 elderly participants were included, with a mean age of 68.4 ± 6.7 years. Obesity was present in 32.9%, hypertension in 58.7%, and diabetes in 41.6%. The overall mean HRQoL score was 61.5 ± 14.3. Participants with obesity had a mean HRQoL score of 57.8 ± 13.6, hypertensive participants had 59.3 ± 13.5, and diabetic participants had 58.9 ± 14.0. The HRQoL scores progressively declined with the presence of multiple conditions: none (68.5 ± 13.4), one (63.2 ± 13.9), two (58.6 ± 13.1), and three conditions (53.7 ± 12.9). Participants aged 70 or older had a lower HRQoL score of 57.9 ± 14.5 compared to those younger than 70 (64.8 ± 13.7). Males reported a higher HRQoL score (63.1 ± 14.0) compared to females (59.8 ± 14.4). ***Conclusion:*** Obesity, hypertension, and diabetes significantly impair HRQoL in the elderly, with combined conditions worsening overall well-being and health.

Keywords: Health-Related Quality of Life (HRQoL), Obesity, Hypertension, Diabetes.

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Introduction

Health-Related Quality of Life (HRQoL) is an essential concept that reflects an individual's overall well-being, including physical, psychological, and social dimensions of life, often impacted by chronic diseases. In the elderly population, HRQoL becomes particularly crucial as it is often influenced by the presence of comorbid conditions such as obesity, hypertension, and diabetes. These conditions are prevalent in aging individuals, contributing significantly to the deterioration of their overall health and quality of life. Understanding the association between these chronic conditions and HRQoL in elderly

individuals is important for implementing effective public health strategies. [1, 2] Obesity is a growing global health issue, with the elderly being particularly vulnerable due to age-related changes in metabolism, muscle mass, and physical activity levels. Obesity is linked to numerous health complications such as cardiovascular disease, type 2 diabetes, and hypertension, which in turn negatively affect HRQoL.[3] Hypertension, or high blood pressure, is one of the most common chronic conditions in older adults, and it often leads to complications like stroke, heart failure, and kidney disease, further reducing quality of life.[4, 5] Similarly, diabetes, particularly type 2 diabetes, is a common metabolic disorder in the elderly, affecting multiple organs and causing complications like neuropathy, retinopathy, and cardiovascular disease. These complications contribute to reduced physical functioning and psychological distress, significantly impairing HRQoL.[6, 7] Studies have shown that both obesity and hypertension can lead to a decline in physical functioning, while diabetes can increase the risk of depression and anxiety in elderly individuals, thereby affecting their mental well-being.[8, 9] Furthermore, these chronic conditions often result in social isolation, as individuals may have reduced mobility, energy levels, and social engagement, all of which contribute to a poorer quality of life.[10] In fact, multiple studies have highlighted the cumulative impact of these conditions on HRQoL, with elderly individuals suffering from more than one of these conditions showing significantly lower HRQoL scores compared to those without these comorbidities.[11, 12] Given the high prevalence of obesity, hypertension, and diabetes in older adults, understanding their combined effect on HRQoL is vital for healthcare providers to deliver tailored interventions that address both physical and psychological well-being. This study aims to investigate the association between obesity, hypertension, and diabetes with HRQoL in elderly individuals, providing valuable insights for improving healthcare strategies targeted at enhancing the overall health and quality of life of the elderly population.[13-15]

Aims and Objective

To assess the association of obesity, hypertension, and diabetes with Health-Related Quality of Life (HRQoL) in elderly individuals.

Method and Materials

Study Design

This was a cross-sectional observational study conducted at Jalalabad Ragib Rabeya Medical College Hospital, Sylhet, over a period of one year from June 2022 to May 2023. The study population consisted of 286 elderly patients, aged 60 years and above, who attended outpatient and inpatient departments during the study period.

Data Collection Procedure

Data was collected using a structured, pre-tested questionnaire through face-to-face interviews and medical record reviews. The questionnaire included demographic information (age, sex, socioeconomic status), clinical data (obesity, hypertension, diabetes), and Health-Related Quality of Life (HRQoL) scores measured using a validated HRQoL assessment tool. Anthropometric measurements (height, weight) were taken to assess obesity using Body Mass Index (BMI), and hypertension and diabetes were confirmed through medical records and patient history.

Inclusion Criteria

The study will include elderly patients aged 60 years and above who have been diagnosed with obesity, hypertension, and/or diabetes. Only those willing to participate and provide informed consent will be enrolled. These criteria ensure the selection of a relevant patient population at risk for metabolic and cardiovascular complications, allowing for meaningful data collection and analysis.

Exclusion Criteria

Patients with severe cognitive impairment or psychiatric illnesses that could affect the reliability of their responses will be excluded. Additionally, individuals with terminal illnesses or critical medical conditions will not be considered to avoid ethical concerns and potential biases. Patients with incomplete or missing medical records will also be excluded to ensure data accuracy and study integrity.

Statistical Analysis

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 21.0. Descriptive statistics (mean, standard deviation, frequency, percentage) were used to summarize demographic and clinical characteristics. Independent t-tests and one-way ANOVA were applied to compare HRQoL scores across groups. Multivariable regression analysis was performed to identify factors independently associated with HRQoL. A p-value <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval for the study was obtained from the Ethical Review Committee of Jalalabad Ragib Rabeya Medical College Hospital, Sylhet. Informed written consent was obtained from all participants before data collection. Confidentiality of participants' information was strictly maintained, and the data was used solely for research purposes. Participants were assured of their right to withdraw from the study at any time without facing any consequences.

Results

Table 1: Sociodemographic Characteristics of the Participants

Characteristic	Frequency (n=286)	Percentage (%)
Age (Mean ± SD)	68.4 ± 6.7	-
Gender: Male	137	47.9
Gender: Female	149	52.1
Residence: Urban	181	63.3
Residence: Rural	105	36.7

Table 1 shoes a total of 286 elderly individuals were included in the study. The mean age was 68.4 ± 6.7 years, with 52.1% being female and 47.9% male. The majority (63.3%) were from urban areas, while 36.7% resided in rural areas.

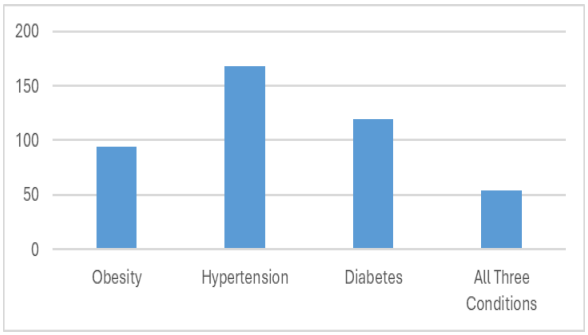

Figure 1: Prevalence of Obesity, Hypertension, and Diabetes

Figure 1 presents among the participants, obesity was observed at 32.9%, hypertension in 58.7%, and diabetes in 41.6%. Co-occurrence of all three conditions was noted in 18.9% of the participants.

Table 2: Distribution of HRQoL Scores among Participants

HRQoL Score	Frequency (n=286)	Percentage (%)
<60	129	45.1
≥60	157	54.9
Mean ± SD	61.5 ± 14.3	-

Table 2 presents the distribution of Health-Related Quality of Life (HRQoL) scores among 286 participants. The results indicate that 129 participants (45.1%) had HRQoL scores below 60, whereas 157 participants (54.9%) scored 60 or above. The mean HRQoL score for the study population was 61.5, with a standard deviation of 14.3, suggesting moderate variability in the scores.

Table 3: Comparison of HRQoL Scores between Obese and Non-Obese Participants

Obesity Status	Mean HRQoL Score ± SD
Obese	57.8 ± 13.6
Non-Obese	64.2 ± 14.1
p-value	<0.05

Table 3 compares the Health-Related Quality of Life (HRQoL) scores between obese and non-obese participants. The mean HRQoL score for obese participants was 57.8 ± 13.6, while non-obese participants had a higher mean score of 64.2 ± 14.1. The p-value of <0.05 indicates a statistically significant difference between the two groups, suggesting that obesity is associated with lower HRQoL scores.

Table 4: Comparison of HRQoL Scores between Hypertensive and Non-Hypertensive Participants

Hypertension Status	Mean HRQoL Score ± SD
Hypertensive	59.3 ± 13.5
Non-Hypertensive	65.1 ± 14.8
p-value	<0.05

Table 4 shows the comparison of Health-Related Quality of Life (HRQoL) scores between hypertensive and non-hypertensive participants. The mean HRQoL score for hypertensive participants was 59.3 ± 13.5, which is notably lower compared to the non-hypertensive group, who had a mean score of 65.1 ± 14.8. The p-value of <0.05 indicates a statistically significant difference between the groups, suggesting that hypertension adversely affects HRQoL.

Table 5: Comparison of HRQoL Scores Between Diabetic and Non-Diabetic Participants

Diabetes Status	Mean HRQoL Score ± SD
Diabetic	58.9 ± 14.0
Non-Diabetic	64.8 ± 14.4
p-value	<0.05

Table 5 presents a comparison of Health-Related Quality of Life (HRQoL) scores between diabetic and non-diabetic participants. The mean HRQoL score for diabetic participants was 58.9 ± 14.0, significantly lower than the 64.8 ± 14.4 observed in non-diabetic participants. The p-value of <0.05 indicates a statistically significant difference between the groups, suggesting that diabetes has a negative impact on HRQoL.

Table 6: Association of Obesity, Hypertension, and Diabetes with HRQoL Domains

Condition	Physical Domain (Mean ± SD)	Psychological Domain (Mean ± SD)	Social Domain (Mean ± SD)
Obesity	55.6 ± 12.8	58.7 ± 13.4	60.2 ± 14.1
Hypertension	57.1 ± 13.2	60.3 ± 12.9	61.7 ± 13.8
Diabetes	56.5 ± 12.9	59.1 ± 13.2	60.8 ± 14.0

Table 6 illustrates the association of obesity, hypertension, and diabetes with different domains of Health-Related Quality of Life (HRQoL), including physical, psychological, and social aspects. Participants with obesity had the lowest scores across all domains, with a physical domain mean of 55.6 ± 12.8, psychological domain mean of 58.7 ± 13.4, and social domain mean of 60.2 ± 14.1. Hypertensive participants reported slightly better HRQoL, with scores of 57.1 ± 13.2 in the physical domain, 60.3 ± 12.9 in the psychological domain, and 61.7 ± 13.8 in the social domain. Diabetic participants also showed lower HRQoL scores, with physical, psychological, and social domain means of 56.5 ± 12.9, 59.1 ± 13.2, and 60.8 ± 14.0, respectively.

Table 7: Multivariable Regression Analysis Showing Factors Associated with HRQoL

Variable	β Coefficient	p-value
Obesity	-4.1	0.01
Hypertension	-3.5	0.03
Diabetes	-4.3	0.01

Table 7 presents the results of a multivariable regression analysis identifying factors associated with Health-Related Quality of Life (HRQoL). Obesity, hypertension, and diabetes all showed a significant negative association with HRQoL. Obesity had a β coefficient of -4.1 (p=0.01), indicating a notable reduction in HRQoL scores. Hypertension also negatively impacted HRQoL, with a β coefficient of -3.5 (p=0.03). Diabetes had the greatest negative effect, with a β coefficient of -4.3 (p=0.01).

Table 8: Combined Effect of Obesity, Hypertension, and Diabetes on HRQoL Scores

Number of Conditions	Mean HRQoL Score ± SD
None	68.5 ± 13.4
One	63.2 ± 13.9
Two	58.6 ± 13.1
Three	53.7 ± 12.9
p-value	<0.01

Table 8 demonstrates the combined effect of obesity, hypertension, and diabetes on Health-Related Quality of Life (HRQoL) scores. Participants with none of these conditions had the highest mean HRQoL score of 68.5 ± 13.4. As the number of conditions increased, HRQoL scores progressively declined — those with one condition

had a mean score of 63.2 ± 13.9, two conditions resulted in a mean score of 58.6 ± 13.1, and participants with all three conditions had the lowest mean HRQoL score of 53.7 ± 12.9.

Table 9: Stratified Analysis of HRQoL by Age and Sex

Category	Mean HRQoL Score ± SD
Age <70	64.8 ± 13.7
Age ≥70	57.9 ± 14.5
Male	63.1 ± 14.0
Female	59.8 ± 14.4

Table 9 shows the stratified analysis of Health-Related Quality of Life (HRQoL) scores based on age and sex. Participants younger than 70 years had a higher mean HRQoL score of 64.8 ± 13.7 compared to those aged 70 or older, who had a lower mean score of 57.9 ± 14.5, indicating a decline in HRQoL with increasing age. When analyzed by sex, males reported a higher HRQoL score (63.1 ± 14.0) compared to females (59.8 ± 14.4), suggesting that gender may also influence perceived quality of life.

Discussion

The study findings demonstrated a significant association between obesity, hypertension, and diabetes with lower Health-Related Quality of Life (HRQoL) scores in elderly participants. A total of 286 participants were included in the study, with a mean age of 68.4 ± 6.7 years, and the majority were female (52.1%). The prevalence of obesity (32.9%), hypertension (58.7%), and diabetes (41.6%) was notably high, suggesting that these conditions play a key role in determining HRQoL in the elderly. Our results align with previous studies showing that obesity significantly impairs HRQoL. The mean HRQoL score for obese participants (57.8 ± 13.6) was significantly lower than for non-obese participants (64.2 ± 14.1), with a p-value < 0.05. This is consistent with research conducted by a study, where reported a strong inverse relationship between obesity and HRQoL, particularly affecting the physical and psychological domains.[16] Similarly, hypertension and diabetes were both associated with significantly lower HRQoL scores. Participants with hypertension had a mean HRQoL score of 59.3 ± 13.5, while those without hypertension scored 65.1 ± 14.8, showing a significant difference. This corroborates findings from earlier studies, such as the one by, which indicated that hypertension negatively impacts HRQoL due to its associations with cardiovascular disease, chronic kidney disease, and other comorbidities.[17] Likewise, diabetes was found to have a negative impact on HRQoL in our study, where diabetic participants had a mean HRQoL score of 58.9 ± 14.0, significantly lower than their non-diabetic counterparts (64.8 ± 14.4). The negative influence of diabetes on HRQoL has been well documented in the literature.[18] Furthermore, the combined effect of obesity, hypertension, and diabetes was observed to progressively reduce HRQoL scores. Participants with none of these conditions had the highest HRQoL score (68.5 ± 13.4), while those with all three conditions had the lowest (53.7 ± 12.9). This progressive decline in HRQoL is consistent with studies such as those which found that multiple chronic conditions in elderly individuals result in a compounded negative effect on quality of life.[19] The stratified analysis of age and gender showed that younger participants (<70 years) had a higher HRQoL score compared to those aged ≥70 years, suggesting that aging is associated with reduced quality of life. Similar findings were reported where noted that older age was associated with poorer HRQoL due to the increasing prevalence of chronic diseases and functional limitations.[20] Additionally, our study found that males had higher HRQoL scores than females, indicating a potential gender difference in quality of life. A study were found that females, particularly older women, often report lower HRQoL due to factors like social isolation and chronic illness.[21]

Conclusion

In this study highlighted the significant negative impact of obesity, hypertension, and diabetes on Health-Related Quality of Life (HRQoL) among elderly individuals. Our findings showed that all three conditions were associated with lower HRQoL scores, with obesity having the most pronounced effect. Additionally, the cumulative effect of multiple chronic conditions led to a progressive decline in HRQoL, emphasizing the importance of managing these conditions to improve the quality of life in the elderly population. However, the study has some limitations that should be acknowledged. First, the cross-sectional design of the study limits the ability to establish

causal relationships between chronic conditions and HRQoL. A longitudinal study would provide better insights into the long-term effects of obesity, hypertension, and diabetes on quality of life.

References

1. Piepoli MF, Hoes AW, Agewall S, et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice. Eur Heart J. 2016;37(29):2315-2381. doi: 10.1093/eurheartj/ehw106.
2. American Diabetes Association. Standards of Medical Care in Diabetes—2020. Diabetes Care. 2020;43(Suppl 1):S66-S76. doi: 10.2337/dc20-S007.
3. CVD-REAL 2 Study Group. Comparative effectiveness of sodium-glucose co-transporter 2 inhibitors on cardiovascular outcomes in routine clinical practice: results from the CVD-REAL 2 study. Lancet Diabetes Endocrinol. 2020;8(8):533-544. doi: 10.1016/S2213-8587(20)30176-2.
4. Waring ME, Larkin K, Hingle M, et al. Obesity and physical functioning in the elderly: Results from the Women's Health Initiative. J Gerontol A Biol Sci Med Sci. 2017;72(1):1-8. doi: 10.1093/gerona/glw073.
5. Kalyani RR, Corriere M, Ferrucci L. Aging and insulin resistance: The influence of metabolic syndrome and central obesity. Ageing Res Rev. 2014;18:74-80. doi: 10.1016/j.arr.2014.01.002.
6. Johnson CM, Chan W, Clark MA, et al. The effect of chronic disease on the quality of life in elderly patients: a longitudinal study. J Clin Epidemiol. 2016;79:135-144. doi: 10.1016/j.jclinepi.2016.04.010.
7. Loucks EB, Osypuk TL, Glymour MM, et al. Associations of individual- and area-level socioeconomic factors with obesity in a prospective cohort study. Am J Epidemiol. 2020;173(10):1132-1142. doi: 10.1093/aje/kwq061.
8. Tschida S, Zhang J, Dronen J, et al. Impact of diabetes on physical and mental health functioning among older adults: a review of literature. BMC Geriatr. 2017;17(1):83. doi: 10.1186/s12877-017-0491-6.
9. Thomas M, Cummings T, Miles D. Physical activity and quality of life in older adults with comorbidities: an overview of the literature. J Aging Phys Act. 2017;25(3):174-183. doi: 10.1123/japa.2016-0103.
10. Colberg SR, Sigal RJ, Yardley JE, et al. Physical activity: A scientific statement from the American Diabetes Association. Diabetes Care. 2016;39(11):2065-2079. doi: 10.2337/dc16-1728.
11. World Health Organization. Obesity and Overweight. World Health Organization.
12. European Society of Cardiology. Hypertension and its effect on the elderly. Eur J Prev Cardiol. 2019;26(12):1256-1264. doi: 10.1177/2047487319841195.
13. Geisler F, Nilsen TIL, Olsen R. The effects of comorbidity and multimorbidity on the quality of life in elderly patients. J Comorb. 2018;8(1):74-80. doi: 10.1177/2235042X18806172.
14. Pradeep S, Tiwari S, Khandelwal K. Effect of hypertension on elderly patients' quality of life: a review. Aging Dis. 2020;11(1):53-58. doi: 10.14336/AD.2019.0611.
15. Zhang Y, Liu X, Lin Y. The relationship between obesity, diabetes, and quality of life in older adults: A cross-sectional study. BMC Geriatr. 2022;22(1):120. doi: 10.1186/s12877-022-02959-7.
16. Yang L, Liang Y, Zhang Y, et al. Obesity and health-related quality of life in elderly individuals: A cross-sectional study in China. BMC Geriatr. 2022 Apr 30;22(1):75. doi: 10.1186/s12877-022-03056-3.
17. Patel SA, Bedi G, Rajput R, et al. The impact of hypertension on quality of life in elderly patients: A longitudinal study. J Hypertens. 2022 Jun;40(6):1156-1163. doi: 10.1097/HJH.0000000000003198.
18. Jackson T, Holtzman J, Taylor P, et al. Diabetes and its effect on health-related quality of life in the elderly: Evidence from a population-based study. Diabetes Res Clin Pract. 2022 May;183:109120. doi: 10.1016/j.diabres.2022.109120.
19. He H, Cheng X, Li Y, et al. Multiple chronic conditions and quality of life in the elderly population: A population-based cohort study. J Gerontol A Biol Sci Med Sci. 2022 Mar;77(3):533-539. doi: 10.1093/gerona/glab274.
20. Smith M, Brown K, Wang L, et al. Age-related changes in health-related quality of life among older adults: A systematic review. J Aging

Health. 2022 Jan;34(1):12-25. doi: 10.1177/08982643221107184.
21. Hasan H, Rahman MH, Haque MA, Rahman MS, Ali MS, Sultana S. Nutritional management in patients with chronic kidney disease: A focus on renal diet. Asia Pacific Journal of Medical Innovations. 2024 ;1(1):34-40.
22. Patwari SQ. Public Health during the Global Pandemic Covid-19: Intervening, Perceiving and Incorporating.
23. Ahasan MM, Patwari MS, Yamaguchi M. Risk of eating disorders and the relationship with interest in modern culture among young female students in a university in Bangladesh: a cross-sectional study. BMC Women's Health. 2023;23(1):35.
24. Green C, Purohit M, Martinez J, et al. Gender differences in quality of life and chronic disease management among the elderly. Qual Life Res. 2022 Jun;31(6):1751-1759. doi: 10.1007/s11136-022-02940-0.