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Quality of Life of Retirees in a Rural Area: A Cross-Sectional Study Using the Modified WHOQOL-BREF

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ABSTRACT: Population aging is an increasingly important public health and social challenge, particularly in rural communities where access to health and social services may be limited. This study aimed to assess the quality of life of retirees in the municipality of Ravna Gora, Croatia, and to examine differences and associations according to sex, self-reported health status, and subjective age

Methods: This cross-sectional study included 156 retirees (89 women and 67 men) aged 55–95 years living in the rural municipality of Ravna Gora, Croatia. Data were collected between November 2025 and February 2026 using a questionnaire comprising sociodemographic and health-related questions and a modified WHOQOL-BREF. All 26 WHOQOL-BREF items were combined into a single quality-of-life (QoL) index ranging from 1 to 5. Because the QoL index was not normally distributed, nonparametric statistical tests were used.

Results: The mean QoL index was 3.45 (SD = 0.49), with values ranging from 1.77 to 4.50. According to the category ranges defined for this study, 56.4% of participants had a QoL index classified as high. QoL did not differ significantly between men and women ($U = 3185$, $p = 0.467$). Self-reported health status was moderately associated with QoL ($\rho = 0.402$, $p < 0.001$), with higher QoL among participants without a current illness ($M = 3.64$) than among those reporting a current illness ($M = 3.22$). QoL also differed significantly according to subjective age ($U = 2994$, $p < 0.001$); participants who felt younger than their chronological age reported higher QoL ($M = 3.71$) than those who felt their chronological age ($M = 3.44$).

Conclusion: Retirees in this rural Croatian community reported a relatively high mean QoL index. QoL was not significantly associated with sex but was higher among participants without a current illness and among those who felt younger than their chronological age.

KEYWORDS: health, quality of life, retirees, rural area.

I. INTRODUCTION

Population aging is one of the most important social and public health challenges of our time, with wide-ranging demographic, economic, and social consequences. According to the 2021 Census, Croatia has 3,871,833 inhabitants, of whom 1,015,783 are pensioners, roughly a quarter of the population [1]. With a mean age of 44.3 years, Croatia has one of the oldest populations in Europe [1]. As the proportion of older adults grows, the ratio of the working population to pensioners falls, placing pressure on pension financing, while the need for health care and long-term care increases [2,3]. Small rural communities feel particular pressure, where health and social support systems are often underdeveloped or difficult to access. The long distances to healthcare facilities, a lack of specialized care, and poor transportation links can heighten the risk of social isolation and loneliness [4]. Consequently, community-based support services, such as home assistance, day centers, and supported living arrangements, are considered vital for helping older adults maintain their independence in their own homes [5,6]. For individuals, reaching this life stage often coincides with retirement – a process of adjustment that some authors describe as unfolding in several phases: initial planning, a "honeymoon" period, followed by disenchantment, reorganization, and finally, a phase of stability [7]. While the terms "aging" and "old age" are frequently used interchangeably, it's important to distinguish that aging refers to ongoing physiological changes, whereas old age signifies the final period of life, closely tied to chronological age [8]. Although the World Health Organization (WHO) classifies individuals aged 65 and above as older adults, retirement commonly begins earlier. The transition away from working life is, in itself, a significant life-course shift with implications for both health and overall well-being [9-11]. Furthermore, the definition of "old age" is increasingly shaped by one's level of activity and

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vitality, rather than solely by chronological age. How individuals perceive their own age is closely linked to their quality of life [12,13]. The WHO defines quality of life as an individual's perception of their place in life, within the context of their culture and value systems, and in relation to their goals, expectations, standards, and concerns [14]. This definition acknowledges the intricate interplay between personal characteristics and the surrounding environment [15]. Existing research suggests that quality of life in later years is influenced by a combination of demographic and personal factors, including gender, health status, and subjective age [16,17]. Studies from Croatia have addressed the quality of life of older adults in rural and regional settings, but data specific to small mountain communities remain scarce [18,19].

Ravna Gora, a municipality in Gorski Kotar, is a typical example of such a community: it is affected by depopulation and population aging, and its geographic and climatic conditions hamper transport and everyday access to health and social services [20]. This study aimed to assess the quality of life of retirees aged 55 years and older in Ravna Gora. Specifically, we examined differences in quality of life between men and women, the association between self-reported health status and quality of life, and differences in quality of life according to subjective age.

II. MATERIALS AND METHODS

Study design and setting

A cross-sectional study was conducted among retirees living in the municipality of Ravna Gora, a small rural mountain community in Gorski Kotar, Croatia, between November 30, 2025, and February 27, 2026. Reporting of this study adhered to the STROBE recommendations [21].

Participants

Participants were retirees living permanently in the municipality of Ravna Gora who were 55 years of age or older. Participants were recruited using convenience sampling. Information about the study was disseminated through a local pensioners' organization, and additional participants were approached during home visits.Eligibility criteria were age ≥55 years, permanent residence in the municipality of Ravna Gora, ability to understand the study instructions, and voluntary informed consent to participate. Participants who did not fulfil the eligibility criteria or who chose not to take part were excluded.Questionnaires that were insufficiently completed for valid analysis were excluded.The final sample comprised 156 participants, including 67 men and 89 women, aged 55–95 years. The total number of questionnaires distributed was not tracked; as a result, the response rate could not be determined. A formal sample size calculation was not performed.

Data collection

Data were collected between November 30, 2025, and February 27, 2026, using a paper-based, self-administered questionnaire. Questionnaires were distributed through a local pensioners' organization and during home visits in the local community. Some questionnaires distributed through the pensioners' organization were subsequently passed on to other potential participants by members of the organization. This approach was used to facilitate access to older adults living in the community.Most participants completed the questionnaire independently. When necessary, the researcher provided assistance with reading or understanding individual questions; however, participants were not provided with suggestions regarding the content of their responses. Completed questionnaires were collected by the researcher.The questionnaire was anonymous and did not contain personally identifying information. Participants received information about the aim of the study and the voluntary nature of their involvement prior to filling in the questionnaire. Returning a completed form was regarded as consent to participate. Since the number of questionnaires distributed was not tracked, it was not possible to determine the response rate. Altogether, 156 completed questionnaires entered the final analysis.

Instruments

Data were collected using a questionnaire consisting of two parts.

Sociodemographic and health-related data.

The first section comprised seven questions covering age (in years), subjective age, sex, type of housing, household composition, highest level of education completed, and current illness. Subjective age was assessed by asking participants whether they felt younger than, approximately the same age as, or older than their chronological age. Current health status was assessed by a single self-reported question and categorized as having a current illness or having no current illness.

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Quality of life.

Quality of life was evaluated with the Croatian adaptation of the WHOQOL-BREF (the short version of the World Health Organization Quality of Life instrument) [22]. The scale includes 26 items covering overall quality of life, health satisfaction, and four domains: physical health, psychological well-being, social relationships, and environment. Each item uses a five-point response format, with the exact wording of the options depending on the item's content. In this study,instead of the conventional domain scores, an overall QoL index was obtained for each participant by averaging all 26 item scores. The index could take values between 1 and 5, with higher scores representing a higher perceived quality of life.

The calculation was based on the following formula:

$$QoL = \frac{\sum_{i=1}^{n} X_i}{n}$$

where X_i is the score on item i and n is the total number of items. The index ranges from 1 to 5, with higher values indicating a higher level of quality of life. The QoL index was classified into five descriptive categories: very low (1.00–1.80), low (1.81–2.60), moderate (2.61–3.40), high (3.41–4.20), and very high (4.21–5.00).These cut-off points were defined by the authors for the purposes of this study and should therefore be interpreted as study-specific descriptive categories rather than standard WHOQOL-BREF categories. Because the present study used a modified scoring approach that combined all 26 items into a single index, the reliability of this modified index was not assessed separately.

Statistical analysis

Data analysis was conducted using Statistica 14.0.0.15 (TIBCO Software Inc.). Absolute frequencies and percentages were used to summarise categorical variables. The QoL index is described by its mean, standard deviation (SD), lowest and highest values. The Shapiro–Wilk test was applied to assess whether the QoL index followed a normal distribution.

Because the distribution deviated significantly from normality (W = 0.973, p = 0.0035), nonparametric statistical methods were used for subsequent inferential analyses. Differences in the QoL index between men and women and between participants who reported feeling younger than their chronological age and those who reported feeling approximately their chronological age were assessed using the Mann–Whitney U test. Participants who reported feeling older than their chronological age were not included in the latter comparison because of the small number of participants in this group (n = 16). The association between self-reported current health status and the QoL index was examined using Spearman's rank correlation coefficient (ρ). Health status was coded as 1 = current illness and 2 = no current illness, with higher values therefore representing a more favorable health status. All statistical tests were two-sided, and a p-value < 0.05 was considered statistically significant.

Ethical aspects

Participation was voluntary and anonymous; no personally identifiable information was collected. Before filling in the questionnaire, participants received information about the study's purpose, the way it would be carried out, and the measures taken to protect anonymity and confidentiality.

They were also informed that they could stop at any time without consequences and without giving a reason. Completion and return of the questionnaire were taken as informed consent to participate. Participants who needed help with reading or understanding the questions were assisted by the researcher. The study did not undergo formal review by an ethics committee, as it was conducted as a small, anonymous, non-interventional survey in a local community.

III. RESULTS

Characteristics of participants

A total of 156 retirees took part in the study, of whom 89 (57.1%) were women and 67 (42.9%) were men. Participants were aged 55 to 95 years. The largest age group was 65 to 74 years (n = 89, 57.1%), followed by 55 to 64 years (n = 33, 21.2%). Most participants had completed vocational secondary school (n = 51, 32.7%) or high school (n = 51, 32.7%). The vast majority lived in their own house (n = 150, 96.2%). Most lived with a partner without children (n = 61, 39.1%), followed by living with a partner and children (n = 36, 23.1%). Seventy participants (44.9%) reported a current illness, and 86 (55.1%) did not. Regarding subjective age, 45 participants (28.8%) felt younger than their chronological age. The sample characteristics are shown in Table 1.

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Table 1. Sociodemographic and health-related characteristics of participants (N = 156)

Characteristics	n	%
Sex		
Women	89	57.1
Men	67	42.9
Age group (years)		
55-64	33	21.2
65-74	89	57.1
75-84	28	17.9
≥85	6	3.8
Education		
Primary school	42	26.9
Vocational secondary school	51	32.7
Higher school	51	32.7
University degree	7	4.5
Master's degree	3	1.9
Doctorate	2	1.3
Housing		
Own house	150	96.2
Other [specify]	6	3.8
Household composition		
With partner, no children	61	39.1
With partner and children	36	23.1
Alone	29	18.6
Shared with others	16	10.3
Without partner, with children	14	9.0
Current illness		
Yes	70	44.9
No	86	55.1
Subjective age		
Feel younger	45	28.8
Feel their age	95	60.9
Feel older	16	10.3

*Note.*Percentages may not add up to 100 because of rounding

Quality of life

The mean QoL index was 3.45 (SD = 0.49), with observed values ranging from 1.77 to 4.50. The distribution of the QoL index significantly deviated from normality (Shapiro–Wilk W = 0.973, p = 0.0035).Based on the study-specific categories defined in the Methods, 88 participants (56.4%) had a high QoL index, while 53 (34.0%) had a moderate QoL index. Eight participants (5.1%) were classified as having a low QoL index, six (3.8%) as having a very high QoL index, and one participant (0.6%) as having a very low QoL index. Overall, 94 participants (60.2%) had QoL index values in the high or very high categories.The descriptive statistics and distribution of participants across the study-specific QoL categories are presented in Table 2.

Table 2. Quality of life index: descriptive statistics and distribution of participants by category (N = 156)

	Value	
Mean (SD)	3.45 (0.49)	
Minimum – maximum	1.77 – 4.50	
QoL category	**n**	**%**
Very low (1.00–1.80)	1	0.6
Low (1.81–2.60)	8	5.1
Moderate (2.61–3.40)	53	34.0
High (3.41–4.20)	88	56.4
Very high (4.21–5.00)	6	3.8
Total	156	100

Note. QoL = quality of life; SD = standard deviation. The QoL index represents the arithmetic mean of the 26 items of the modified WHOQOL-BREF and ranges from 1 to 5, with higher values indicating higher perceived quality of life. The QoL categories were defined by the authors for the purposes of this study and are not standard WHOQOL-BREF categories. Percentages may not add up to 100.0% because of rounding..

Quality of life according to participant characteristics

The QoL index did not differ significantly between men and women. The mean QoL index was 3.48 (SD = 0.50) among men and 3.43 (SD = 0.49) among women (Mann–Whitney U = 3185, p = 0.467).

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Participants who reported no current illness had a descriptively higher mean QoL index (M = 3.64, SD = 0.38) than those who reported a current illness (M = 3.22, SD = 0.52). Spearman's rank correlation showed a moderate positive association between more favorable self-reported health status and QoL ($\rho = 0.402$, $p < 0.001$), indicating that participants reporting no current illness tended to have higher QoL index values.

Regarding subjective age, participants who reported feeling younger than their chronological age had a higher mean QoL index (M = 3.71, SD = 0.39) than those who reported feeling approximately their chronological age (M = 3.44, SD = 0.39). This difference was statistically significant (Mann–Whitney U = 2994, $p < 0.001$). The 16 participants who reported feeling older than their chronological age were not included in this two-group comparison because of the small size of this subgroup.Detailed results are presented in Table 3.

Table 3. Quality of life index by sex, health status and subjective age

Variable	Group	n	QoL index, M (SD)	Test statistic	p
Sex	Men	67	3.48 (0.50)	U = 3185	0.467
	Women	89	3.43 (0.49)		
Health status	No current illness	86	3.64 (0.38)	ρ = 0.402	< 0.001
	Current illness	70	3.22 (0.52)		
Subjective age	Feel younger	45	3.71 (0.39)	U = 2994	< 0.001
	Feel their age	95	3.44 (0.39)		

Note. QoL = quality of life; M = mean; SD = standard deviation; U = Mann–Whitney U test; ρ = Spearman's rank correlation coefficient. For health status, participants were coded as 1 = current illness and 2 = no current illness. The 16 participants who reported feeling older than their chronological age were not included in the two-group comparison of subjective age.

IV. DISCUSSION

This study examined quality of life among retirees living in a small rural mountain community in Croatia, with particular attention to sex, self-reported health status, and subjective age. The mean QoL index was 3.45 on a 1–5 scale, and more than half of the participants were classified within the study-specific high QoL category. No statistically significant difference in QoL was observed between men and women. In contrast, more favorable self-reported health status was associated with higher QoL, and participants who perceived themselves as younger than their chronological age reported higher QoL than those who felt approximately their chronological age. These findings suggest that perceived health and subjective perceptions of aging may be relevant correlates of QoL among retirees living in rural communities.

The absence of a significant difference between men and women is consistent with some previous studies, such as the research by da Rocha et al. [23]. It may indicate that men and women in later life share similar living conditions and perceive their well-being similarly, or that differences present earlier in life diminish with age. However, the study was not designed to test equivalence between the sexes, so this finding should be interpreted with caution.

Participants who reported no current illness had a higher quality of life than those who reported an illness, and the association was moderate. Buujang and colleagues draw attention to similar claims in their research [24]. Good health likely supports functional ability, independence, and participation in everyday activities, which may be reflected in a more positive assessment of one's life. Because of the cross-sectional design, the direction of the association cannot be determined: lower quality of life may also make a person more likely to report illness. Health was measured with a single self-reported item, which limits its precision. Retirees who felt younger than their chronological age reported a higher quality of life than those who felt their age. A younger subjective age may reflect greater vitality, an active lifestyle, and a more positive attitude toward health and aging, as mentioned by Stephan and colleagues in their research [25]. While some studies, such as the research by Fernandez-Ballba and colleagues, have found no significant relationship between subjective age and quality of life, this study found a clear difference [26]. Since people who feel younger are also likely to be healthier, part of this difference may be attributable to health status, and the two factors could not be separated in the present

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analysis. Relatively high quality of life has also been reported in other rural populations [27]. Smaller communities are often characterized by closer interpersonal relationships, a stronger sense of belonging, and more frequent mutual help, which may protect psychological well-being, as Michalska-Żyła et al. discuss in their work [28]. One factor mentioned in the literature as beneficial to older people is help at home provided through the "Zaželi" program, in which Ravna Gora participates [29]; its role in this population was not examined here. Conversely, loneliness and a lack of good social contacts are among the main factors associated with lower quality of life in older people [30]. Rural areas may also have limited access to health services and organized activities for older people [31]. Since the study did not look at differences between rural and urban retirees, any explanations we offer on that point have to stay speculative. Still, the results can help guide the design of activities and support programmes aimed at older adults living in the countryside. Efforts that protect health, foster active ageing and strengthen social ties, whether through local events, practical support schemes or preventive health initiatives, may go some way towards keeping people functionally independent and feeling positive about their lives.

Limitations

This study comes with several limitations that should be kept in mind. The sample was gathered by convenience, and a substantial share of participants came through a local pensioners' association. People who belong to such groups tend to be more socially engaged and may therefore report a better quality of life than retirees who stay outside community activities, which narrows how far the findings can be generalised. The sample itself is fairly small and drawn from only one geographic area; because the total number of questionnaires handed out was never recorded, it was impossible to calculate a response rate or to rule out non-response bias. In some cases the researcher helped respondents complete the form, and that assistance may have shaped the answers they gave. Quality of life was assessed with a modified version of the WHOQOL-BREF in which every item was collapsed into a single overall score. Both health status and subjective age rested on self-report, and neither chronological age nor other possible confounding factors were adjusted for in the analysis. Finally, the cross-sectional design means the data cannot support any claims about cause and effect.

V. CONCLUSIONS

Retirees living in this rural community reported a relatively high quality of life overall. Scores were much the same for men and women, yet they rose among those who were free of current illness and among people who felt younger than their actual age. Keeping people healthy and helping them maintain a positive view of growing older may therefore be useful goals for local programmes aimed at older residents in the countryside. To put these observations on firmer ground, future work will need larger, more varied samples and designs that follow participants over time.

CONFLICT OF INTEREST

The authors do not have any conflicts of interest to disclose.

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