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Article

Quality of Life as a Predictor of Successful Aging among Older Adults: A Cross-Sectional Study in Urban and Rural Settings

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Highlights

Main findings

- Older adults in rural areas reported lower self-rated successful aging (SSAS) and personal wellbeing (PWI) than those in urban/suburban areas. PWI was the strongest positive predictor while rural residence and chronic illness were negative predictors.
- Active community involvement was positively associated with quality of life, whereas regret over missed opportunities or past actions had negative associations; no significant gender differences were observed in SSAS or PWI.

Implications of the main findings

- Promoting social engagement and psychosocial support could improve successful aging in rural areas
- Considering well-being alongside health status and addressing rural disparities could improve aging programs.

Abstract

Background: Population aging has increased attention on the quality of life and successful aging of older adults. **Objective:** To examine urban–rural differences in subjective quality of life and self-rated successful aging, explore associations with psychosocial factors, and identify predictors of successful aging, including potential moderating effects of place of residence and chronic illness. **Methods:** A cross-sectional study was conducted among 403 adults aged ≥ 60 years in Eastern Croatia. Measures included a sociodemographic questionnaire, the Self-assessment of Successful Ageing Scale (SSAS), and the Personal Wellbeing Index (PWI). Data were analyzed using nonparametric tests (Mann–Whitney U, Spearman's correlation), linear regression, and moderation analyses. Significance was set at $p < 0.05$. Ethical approval was obtained (Class: 602-01/24-12/02; IRB: 2158/97-97-10-24-36). **Results:** Rural participants reported lower PWI scores ($p = 0.005$) and self-rated successful aging ($p < 0.001$) than urban participants. Active community involvement was positively associated with quality of life (Rho = 0.46; $p < 0.001$), whereas regret about missed opportunities and past actions was negatively associated (Rho = -0.20 ; $p < 0.01$). Regression analyses explained 48.3% of the variance in SSAS, with PWI as a strong positive predictor, and rural residence and chronic illness as negative predictors.

Moderation analyses indicated that the association between PWI and SSAS was consistent across different environmental contexts and in the presence of illness. **Conclusion:** Older adults living in rural areas reported lower quality of life and self-rated successful aging compared with those in urban and suburban areas, with subjective well-being emerging as a key predictor. Promoting social engagement and addressing psychosocial barriers may enhance successful aging, particularly in rural populations.

Keywords: quality of life; successful aging; older adults; urban and rural settings

1. Introduction

The pace of global population aging has accelerated markedly compared with previous decades. In 2020, the number of individuals aged 60 years and older surpassed the number of children under five [1], and current projections indicate that this demographic will increase from approximately one billion in 2020 to more than two billion by 2050, with one in six people worldwide expected to be aged 60 years or older by 2030 [2]. Concurrently, the population of adults aged 80 years and above is projected to triple, rising from about 140 million in 2020 to approximately 426 million by 2050 [1].

Although increased life expectancy is widely recognized as an indicator of biomedical, social, and economic advancement [3], population aging simultaneously poses a substantial challenge to the sustainability of these systems [4]. Accelerating demographic trends, coupled with systemic pressures, may compromise the living conditions and overall well-being of older adults. Population aging is therefore characterized not only by changes in the age structure of the population but also by shifts in the health and social care needs of older adults, the availability and organization of care systems, and the social dynamics shaped by the specific contexts in which older adults live.

Older adults are considered a high-risk group in terms of health and quality of life [5] being particularly vulnerable to chronic diseases, geriatric syndromes, and multimorbidity, which in turn increases the demand for healthcare services [6–9]. Moreover, they face a higher likelihood of requiring both formal and informal long-term care [10,11]. Therefore, it is crucial to ensure environments in which additional years of life are lived in good health and within supportive settings, where individuals' ability to remain functional, independent, and active is minimally constrained [12]. In this context, ensuring a high quality of life in later life occupies a central role.

1.1. Biopsychosocial Perspectives on Quality of Life in Older Adults

Quality of life is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns [13]. It is a complex, multidimensional construct encompassing physical health, psychological state, level of independence, social relationships, personal beliefs, and one's relationship to key features of the environment. Quality-of-life assessment is inherently subjective and shaped by the context in which a person lives [13], reflecting the interplay of biological, psychological, and social factors [14]. Accordingly, the present study examines the subjective dimension of quality of life, with particular attention to the personal wellbeing of older adults.

Although quality of life tends to decline in very old age, its association with chronological age is not linear, as periods of relative stability and even potential improvement may occur [15]. The process is highly dynamic and individualized [16], supporting an understanding of aging as a heterogeneous phenomenon characterized by concurrent losses and compensatory adaptations [17].

Given this dynamic and heterogeneous nature of aging, quality of life in older adults is examined within a biopsychosocial framework [18], extending beyond earlier approaches that focused solely on health status. Notably, self-perceived quality of life can remain high despite physical decline [14], underscoring its subjective and complex nature. Due to its multidimensionality, a variety of factors influence quality of life among older adults [16]. This framework conceptualizes quality of life as a dynamic process, in which daily opportunities and available resources shape individuals'

perceptions of their own aging. Subjective assessments are thus oriented toward incorporating factors and resources that enable older adults to perceive themselves as successful in the aging process, even amidst health or social limitations.

1.2. Successful Aging

Successful aging involves the preservation of physical, cognitive, and social functioning, along with the maintenance of high quality of life, including its subjective dimensions [19]. It entails the ability of older adults to maintain daily independence, participate actively in their communities, and adapt to life with chronic conditions or functional limitations [8]. The relationship between quality of life and successful aging has become an increasingly important area of research, particularly in societies with a growing proportion of older adults [20]. Implementing strategies that promote biological, psychological, and social wellbeing can enhance quality of life and support successful aging [21].

Considering the pronounced differences in resource availability, social networks, and living conditions between urban and rural areas [22], there is a need for a deeper understanding of how these contexts shape the quality of life and successful aging of older adults. Accordingly, the aim of this study was to examine urban–rural differences in subjective quality of life and self-rated successful aging among older adults, to analyze their associations with psychosocial factors, and to identify predictors of successful aging, including the potential moderating effects of place of residence and chronic illness.

2. Materials and Methods

2.1. Study Design

This quantitative cross-sectional study across urban and rural settings was conducted between January and June 2024 in the Eastern region of Croatia—Slavonia in participants' homes. The study is part of a larger research project on successful aging, from which a previous article has been published [23].

2.2. Participants

The study population comprised community-dwelling older adults, defined according to the United Nations classification as individuals aged 60 years and above [24]. Eligibility criteria included: (1) chronological age ≥ 60 years, (2) ability to provide informed consent, and (3) residence in the community, excluding individuals living in institutionalized care facilities. Based on these criteria, the target population consisted of 403 individuals, exceeding the minimum required sample of 384 to achieve a 5% margin of error at a 95% confidence level. The total population of persons aged 60 and older in the Eastern region of Croatia (Slavonia) was 181,904. Sample size calculations were performed using a Sample Size Calculator [25].

The final sample comprised 403 participants with complete gender data, of whom 175 were male (43.4%) and 228 female (56.6%). No participants identified as "Other." The median chronological age was 70 years (range 60–92). Power analysis confirmed that the sample size provided at least 0.80 statistical power for all analyses performed, including multivariate regression, with an observed power of 0.95 [26]. The response rate was 82.96%, indicating a representative sample.

2.3. Instruments

The study employed validated instruments, including the Personal Wellbeing Index (PWI) [27] and the Self-assessment of Successful Ageing Scale (SSAS) [28].

The PWI measures personal well-being through seven items of satisfaction, each corresponding to a quality of life domain: standard of living, health, achievements in life, personal relationships, sense of security, community connectedness, and future security. These domains are theoretically embedded, representing the first level of deconstruction of the global question, "How satisfied are

you with your life as a whole?”. Responses are rated on an 11-point scale (0–10), ranging from “no satisfaction at all” to “completely satisfied,” with the overall score calculated as the mean of all domains. In this study, PWI scores are interpreted as reflecting the subjective dimension of quality of life, and the scale demonstrates high internal consistency (Cronbach’s $\alpha = 0.85$, McDonald’s $\omega = 0.87$).

The SSAS [29] consists of 20 items evaluating individuals’ perceptions of their own ageing experience, using a five-point Likert scale (1 = “does not apply to me at all” to 5 = “fully applies to me”). The total score, calculated as the mean of all items, ranges from 20 to 100, with higher scores indicating a more positive perception of successful ageing. The scale demonstrates high internal consistency (Cronbach’s $\alpha = 0.88$, McDonald’s $\omega = 0.89$).

The survey also included general and sociodemographic questions, followed by three additional items assessing participants’ perceived level of engagement in their community, regret over missed opportunities, and regret regarding past actions they now consider unwise. These items, drawn from the literature [28], relate to constructs discussed in the context of personal well-being and successful aging, particularly community engagement and regret as self-evaluative experiences.

2.4. Data Collection

Data were gathered using a non-probability quota sampling framework to achieve proportional representation of urban and rural participants, reflecting the study’s emphasis on socio-environmental determinants. Recruitment was further facilitated through a chain-referral procedure (snowball sampling technique), whereby enrolled individuals identified additional eligible participants. Data were collected in participants’ homes. Prior to fieldwork, research staff completed targeted training in communication strategies and psychological approaches relevant to engagement with older adults. Prospective participants received comprehensive written and verbal briefings on study objectives, procedures, and ethical safeguards, and provided written informed consent. Participation was fully voluntary and anonymous, with the option to withdraw at any point. Surveys were completed independently using the paper-and-pen method, with researchers providing clarification only to support comprehension without influencing responses. During the assessment of the Personal Wellbeing Index, researchers followed the authors’ administration guidelines, which require allowing respondents to skip items they do not understand and avoiding any additional explanations or examples that could shape item interpretation [27]. No time restrictions were imposed.

2.5. Ethical Considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (1975, revised in 2013). Participation was voluntary and anonymous, and participants could withdraw at any time. Written approval was obtained from the Higher Institution Ethical Committee of the Faculty of Dental Medicine and Health Osijek (Class: 602-01/24-12/02; IRB: 2158/97-97-10-24-36). All participants received written and verbal information regarding the study’s aims, procedures, and ethical considerations, and provided written informed consent. Surveys were completed independently; researchers offered clarification only to support comprehension without guiding responses. Anonymity was maintained during and after data collection by separating the survey from the informed consent forms.

2.6. Data Analysis

The frequency distributions of variables were described using descriptive statistical methods. The distribution of continuous variables was assessed using the Shapiro–Wilk test, which indicated statistically significant deviations from normality ($p < 0.05$). Accordingly, measures of central tendency and dispersion were reported as medians (Me) and interquartile ranges (IQR). Differences between two independent groups were examined using the Mann–Whitney U test. Associations between variables were assessed using Spearman’s rank correlation coefficient (ρ).

Linear regression analysis using a stepwise method was conducted to examine predictors of SSAS. Prior to regression analysis, assumptions of linearity, normality of residuals, homoscedasticity, and multicollinearity were assessed and met. Additional moderation analyses were performed to examine whether the association between PWI and SSAS was moderated by place of residence or the presence of chronic illness. Statistical significance was set at $p < 0.05$.

All analyses were conducted using MedCalc® Statistical Software version 22.023 (MedCalc Software Ltd., Ostend, Belgium), IBM SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA), and JASP version 0.19.3 (University of Amsterdam, The Netherlands).

3. Results

A total of 403 participants from the eastern region of Croatia–Slavonia took part in the study. Their median age was 70 years (range 60–92), and the majority were female ($n = 228$, 56.6%). Participants were almost equally divided by place of residence, with 202 (50.1%) living in a city or suburban area and 201 (49.9%) living in a village. Regarding educational attainment, most participants had completed secondary education ($n = 183$, 45.4%), followed by primary education ($n = 172$, 42.7%). The majority were married ($n = 210$, 52.1%). Household monthly income varied, with 11 participants (2.7%) reporting no income, while the largest proportion ($n = 120$, 29.8%) reported income of 132.72–318.54 EUR per month. More than half of the participants ($n = 206$, 51.1%) reported at least one chronic illness, most commonly cardiovascular disorders ($n = 108$, 51.4%) and endocrine system disorders ($n = 71$, 34.0%), while no respondents reported integumentary or lymphatic system disorders.

Participants also rated their community involvement, regret regarding missed opportunities, and regret about past actions with a median score of 3 (IQR 2–4) for all three items (Table 1).

Table 1. Sociodemographic characteristics of respondents.

| Characteristics of Respondents | Category | n (%) / Median (IQR) |
|--------------------------------|-------------------------------|----------------------|
| Gender | Male | 175 (43.4) |
| | Female | 228 (56.6) |
| | Other | 0 (0) |
| Place of residence | City/suburban settlement | 202 (50.1) |
| | Village | 201 (49.9) |
| Educational attainment | Primary school | 172 (42.7) |
| | Secondary school | 183 (45.4) |
| | Undergraduate/graduate degree | 47 (11.7) |
| | Postgraduate degree (PhD) | 1 (0.2) |
| Marital status | Married | 210 (52.1) |
| | Widowed | 127 (31.5) |
| | Divorced | 33 (8.2) |
| | In a relationship | 7 (1.7) |
| | Single | 26 (6.5) |
| Household monthly income | No income | 11 (2.7) |
| | 66.36 - 132.57 EUR | 23 (5.7) |
| | 132.72 - 318.54 EUR | 120 (29.8) |
| | 318.68 - 450.98 EUR | 98 (24.3) |
| | 451.11 - 597.34 EUR | 80 (19.9) |
| | more than 597.47 EUR | 71 (17.6) |
| Chronic illness | Suffer from chronic illness | 206 (51.1) |
| | Cardiovascular system | 108 (51.4) |
| Type of illness (n = 206) | Respiratory system | 18 (4.5) |
| | Nervous system | 13 (6.3) |
| | Integumentary system | 0 |
| | | |

| | | |
|--|-------------------------------|--------------|
| | Musculoskeletal system | 29 (14.1) |
| | Endocrine system | 71 (34.0) |
| | Gastrointestinal system | 15 (7.3) |
| | Lymphatic system | 0 |
| | Urinary system | 8 (2) |
| | Reproductive system | 5 (1.2) |
| | Immune system | 4 (1) |
| Chronological age | Years | 70 (67 – 77) |
| Perceived level of active involvement in the community in which they live | 1 = not at all; 5 = very much | 3 (2 – 4) |
| Extent to which they regret missed opportunities in life | 1 = not at all; 5 = very much | 3 (2 – 4) |
| Extent to which they regret things they have done in life but now believe they should not have | 1 = not at all; 5 = very much | 3 (2 – 4) |

Between-group differences in self-perceived successful ageing and quality-of-life indicators were assessed using the Mann–Whitney U test. Participants residing in rural areas reported significantly lower levels of self-assessed successful ageing (median 67, IQR 58–75) compared with their urban/suburban counterparts (median 72, IQR 64–78; $p < 0.001$). They also had lower scores on the PWI (median 64, IQR 50–78 vs. 69, IQR 57–80; $p = 0.005$). Within the PWI domains, rural participants reported significantly lower satisfaction with Health ($p = 0.02$), Achieving in life ($p = 0.01$), Relationships ($p = 0.04$), Safety ($p < 0.001$), Community ($p = 0.02$), and Future security ($p = 0.02$). No significant difference was observed for the Standard of living domain ($p = 0.06$) (Table 2).

Table 2. Differences in SSAS and PWI scores between urban/suburban and rural older adults.

| Domain | Total | Urban/Suburban area | Rural area | p^* |
|---|--------------|---------------------|--------------|--------|
| Median (IQR) | | | | |
| The Self–assessment of Successful Ageing Scale (20–100) | 69 (61 – 76) | 72 (64 – 78) | 67 (58 – 75) | <0.001 |
| Personal Wellbeing Index (0–100) | 66 (53 – 80) | 69 (57 – 80) | 64 (50 – 78) | 0.005 |
| Standard (0–100) | 60 (50 – 80) | 60 (50 – 80) | 60 (50 – 80) | 0.06 |
| Health (0–100) | 60 (50 – 80) | 60 (50 – 80) | 50 (40 – 80) | 0.02 |
| Achieving (0–100) | 70 (50 – 80) | 70 (50 – 80) | 60 (50 – 80) | 0.01 |
| Relationships (0–100) | 80 (60 – 90) | 80 (60 – 90) | 70 (50 – 90) | 0.04 |
| Safety (0–100) | 70 (50 – 90) | 70 (60 – 90) | 60 (50 – 80) | <0.001 |
| Community (0–100) | 70 (50 – 90) | 70 (60 – 90) | 65 (50 – 85) | 0.02 |
| Future (0–100) | 70 (50 – 80) | 70 (50 – 80) | 60 (50 – 80) | 0.02 |

* Differences between urban/suburban and rural areas were assessed using the Mann–Whitney U test.

Between-group differences between male and female older adults in self-perceived successful ageing and quality-of-life indicators were assessed using the Mann–Whitney U test. No statistically significant differences were observed (Table 3).

Table 3. Differences in SSAS and PWI scores between male and female older adults.

| Domain | Male | Female | p^* |
|---|--------------|----------------|-------|
| Median (IQR) | | | |
| The Self–assessment of Successful Ageing Scale (20–100) | 69 (61 – 75) | 70 (60.3 – 78) | 0.38 |

| | | | |
|----------------------------------|--------------|--------------|------|
| Personal Wellbeing Index (0–100) | 67 (54 – 80) | 66 (53 – 80) | 0.73 |
| Standard (0–100) | 60 (50 – 80) | 60 (50 – 80) | 0.25 |
| Health (0–100) | 60 (50 – 80) | 60 (40 – 80) | 0.47 |
| Achieving (0–100) | 70 (50 – 80) | 70 (50 – 80) | 0.73 |
| Relationships (0–100) | 80 (60 – 90) | 80 (60 – 90) | 0.64 |
| Safety (0–100) | 70 (50 – 80) | 70 (50 – 90) | 0.86 |
| Community (0–100) | 70 (50 – 90) | 70 (50 – 90) | 0.61 |
| Future (0–100) | 70 (50 – 80) | 70 (50 – 80) | 0.32 |

*Mann Whitney U test.

Spearman's rank correlation coefficient (ρ) was used to assess the relationships between the scales, subscales, and participants' age, perceived level of active involvement in the community, extent of regret for missed opportunities in life, and extent of regret for actions now considered wrong.

Age was negatively correlated with scores on the standard of living and self-rated successful aging scales (-0.145 ; $p < 0.001$), indicating that older participants tended to report lower levels on these measures, while correlations with the PWI scale and its subscales were not significant. Perceived active involvement in the community was positively correlated with the PWI scale and all its subscales ($\rho = 0.258$ – 0.438 ; $p < 0.001$), including standard of living, health, life achievements, close relationships, security, sense of belonging, future security, and the personal quality-of-life index. Extent of regret for missed opportunities and regret for actions now considered wrong were negatively correlated with several subscales, including life achievements, close relationships, safety, and the PWI (Table 4).

Table 4. Associations between SSAS, PWI domains, and age, community involvement, and regret measures.

| | Age | Community involvement | Regret: missed opportunities | Regret: past actions |
|---|-----------------------|-----------------------|------------------------------|-----------------------|
| Spearman's Correlation Coefficient ρ (p -value) | | | | |
| The Self-assessment of Successful Ageing Scale | -0.145 (<0.001) | 0.431 (<0.001) | -0.090 (0.07) | -0.046 (0.36) |
| Personal Wellbeing Index | 0.034 (0.49) | 0.329 (<0.001) | -0.242 (<0.001) | -0.131 (0.01) |
| Standard | -0.05 (0.31) | 0.373 (<0.001) | -0.111 (0.03) | -0.068 (0.18) |
| Health | -0.081 (0.10) | 0.393 (<0.001) | -0.210 (<0.001) | -0.150 (<0.001) |
| Achieving | -0.014 (0.77) | 0.258 (<0.001) | -0.132 (0.01) | -0.151 (<0.001) |
| Relationships | -0.054 (0.28) | 0.329 (<0.001) | -0.150 (<0.001) | -0.107 (0.03) |
| Safety | -0.036 (0.48) | 0.422 (<0.001) | -0.139 (0.01) | -0.097 (0.05) |
| Community | -0.05 (0.32) | 0.438 (<0.001) | -0.172 (<0.001) | -0.085 (0.09) |
| Future | -0.051 (0.31) | 0.465 (<0.001) | -0.205 (<0.001) | -0.148 (<0.001) |

Correlation between the Self-assessment of Successful Ageing Scale and the Personal Wellbeing Index (PWI) with its subscales was assessed using Spearman's rank correlation coefficient. The Self-assessment of Successful Ageing Scale was positively correlated with the PWI total score and all subscales. Correlation coefficients ranged from moderate ($\rho = 0.397$ – 0.490) for PWI total, Achieving, Safety, and Community, to strong ($\rho > 0.50$) for Standard of living, Health, Relationships, and Future, all statistically significant ($p < 0.001$) (Table 5).

Table 5. Correlations between SSAS and PWI domains.

| | The Self-assessment of Successful Ageing Scale |
|--------------------------|---|
| | Spearman's Correlation Coefficient ρ (p -value) |
| Personal Wellbeing Index | 0.397 (<0.001) |

| | |
|---------------|----------------|
| Standard | 0.560 (<0.001) |
| Health | 0.583 (<0.001) |
| Achieving | 0.467 (<0.001) |
| Relationships | 0.510 (<0.001) |
| Safety | 0.479 (<0.001) |
| Community | 0.490 (<0.001) |
| Future | 0.610 (<0.001) |

Prior to conducting linear regression, assumptions of multicollinearity, normality, linearity, and homoscedasticity were assessed. Variance inflation factors (VIF) indicated no multicollinearity among predictors (VIF < 2). Residuals were examined using Q-Q plots and scatterplots, which confirmed approximate normality and linearity. No influential cases were identified (Cook's distance < 0.05). Subsequently, a linear regression using a stepwise method was conducted to examine predictors of SSAS. Four models were tested: the intercept-only model (M_0), a model including only the total PWI (M_1), a model including PWI and place of residence (0 = City/suburban, 1 = Village; M_2), and a model including PWI, place of residence and dummy variable of presence of chronic illness (0 = No, 1 = Yes; M_3). The intercept-only model (M_0) is omitted as it provides no meaningful information.

M_1 was significant and explained 45.9% of the variance in SSAS ($R^2 = 0.459$, Adjusted $R^2 = 0.457$; $F(1, 396) = 335.51$, $p < 0.001$). Higher PWI scores predicted higher SSAS scores ($B = 0.608$, $SE = 0.033$, $\beta = 0.677$, $t = 18.32$, $p < 0.001$).

M_2 added place of residence and further increased explained variance to 47.8% ($R^2 = 0.478$, Adjusted $R^2 = 0.475$; $F(2, 395) = 180.492$, $p < 0.001$). Higher PWI scores remained a strong positive predictor ($B = 0.589$, $SE = 0.033$, $\beta = 0.656$, $t = 17.818$, $p < 0.001$), and living in a village was associated with lower SSAS scores ($B = -3.232$, $SE = 0.856$, $\beta = -0.139$, $t = -3.775$, $p < 0.001$).

M_3 was significant and explained 48.3% of the variance in SSAS ($R^2 = 0.483$, Adjusted $R^2 = 0.475$; $F(3, 394) = 122.495$, $p < 0.001$). Higher PWI scores remained a strong positive predictor ($B = 0.571$, $SE = 0.034$, $\beta = 0.636$, $t = 16.747$, $p < 0.001$), living in a village remained associated with lower SSAS scores ($B = -3.293$, $SE = 0.854$, $\beta = -0.142$, $t = -3.857$, $p < 0.001$), and the presence of chronic illness was associated with lower SSAS scores ($B = -1.719$, $SE = 0.873$, $t = -1.968$, $p = 0.05$) (Table 6).

Table 6. Linear regression of PWI, place of residence and chronic illness as a predictors of SSAS.

| Model | Predictor | B | SE | β | t | p |
|-------|--------------------|--------|-------|---------|--------|--------|
| M_1 | Intercept | 40.601 | 1.589 | – | 25.552 | <0.001 |
| | PWI | 0.608 | 0.033 | 0.677 | 18.317 | <0.001 |
| M_2 | Intercept | 43.086 | 1.696 | – | 25.404 | <0.001 |
| | PWI | 0.589 | 0.033 | 0.656 | 17.818 | <0.001 |
| | Residence * | -3.232 | 0.856 | -0.139 | -3.775 | <0.001 |
| M_3 | Intercept | 44.801 | 1.901 | – | 23.562 | <0.001 |
| | PWI | 0.571 | 0.034 | 0.636 | 16.747 | <0.001 |
| | Residence * | -3.293 | 0.854 | -0.142 | -3.857 | <0.001 |
| | Chronic illness ** | -1.719 | 0.873 | – | -1.968 | 0.05 |

* Residence: 0 = City/suburban, 1 = Village; ** Chronic illness: 0 = No, 1 = Yes. Standardized coefficients (β) reported only for continuous predictors.

Additional moderation analyses were conducted to examine whether the relationship between PWI and SSAS was moderated by place of residence or the presence of chronic illness. The overall model was significant ($R^2 = 0.487$, Adjusted $R^2 = 0.479$, $F(6, 391) = 61.820$, $p < 0.001$). PWI was a significant positive predictor of SSAS ($B = 0.589$, $\beta = 0.656$, $t = 9.145$, $p < 0.001$). None of the interaction terms were statistically significant (all $p > 0.05$), and therefore only the main effects were interpreted. Neither the presence of chronic illness ($B = -1.934$, $t = -0.544$, $p = 0.587$) nor place of residence ($B = 1.235$, $\beta = 0.053$, $t = 0.341$, $p = 0.737$) were significant predictors.

4. Discussion

Due to the global trend of population aging, there has been a growing emphasis on studying quality of life and successful aging among older adults [30,31]. This study specifically examined differences and predictors of successful aging, considering the contrasts between urban and rural areas and accounting for the presence of chronic illness, which are theoretically expected to negatively affect successful aging [19]. In particular, the study aimed to determine whether quality of life, as a subjective dimension that can typically be enhanced through psychosocial interventions and community-based public health programs [32], represents the strongest predictor of successful aging, potentially independent of comorbid conditions. To address these questions, the study included equally distributed participants, with 202 (50.1%) residing in urban areas and 201 (49.9%) in rural areas. The median age was 70 years, and approximately half of the participants had chronic illness, which is expected given the increased risk of various health conditions in older age [33].

The results indicate a persistent disparity between urban and rural areas, highlighting the need to examine various dimensions of quality of life and successful aging while taking into account sociodemographic factors that may shape these outcomes. Therefore, this discussion focuses on sociodemographic determinants, the subjective dimension of quality of life, and successful aging. Although studies often examine separate constructs, such as quality of life and personal well-being, their combined interpretation is justified because they are theoretically linked, with personal well-being considered as a subjective dimension of quality of life [27].

4.1. Sociodemographic Differences Between Urban and Rural Areas

The analysis of sociodemographic determinants revealed no statistically significant gender differences in personal wellbeing or in successful aging. These findings are consistent with the results reported by Vuletić and Stapić [34] who likewise observed no significant gender differences in personal wellbeing among older adults. However, evidence from other studies suggests that gender differences in quality of life [35] and successful aging [36,37] do exist. Such differences appear to be strongly shaped by cultural and social contexts, including gender roles and broader environmental conditions. Consequently, gender related variations in self perceptions of quality of life and successful aging are not universal but vary across countries and sociocultural settings. In the present study, chronological age was found to be significantly and negatively associated with successful aging. This finding contrasts with the results reported by Tucak Junaković et al. [38] in which age emerged as a significant positive predictor of successful aging. The authors interpreted this association by suggesting that individuals who reach advanced age may perceive longevity itself as an indicator of successful aging. The discrepancy between these findings may be partly explained by regional characteristics of the studied populations. The present study was conducted in Eastern Croatia (Slavonia), the least developed macroregion in the country [39], characterized by particularly unfavorable demographic trends compared with other Croatian regions [40]. The population of this area was heavily affected by war related losses in the early 1990s, and the age group examined in this study largely belonged to the adult population at that time. As a result, a substantial portion of their lives was spent under conditions of prolonged socioeconomic insecurity [41], which may negatively shape perceptions of one's own aging. In contrast, the study by Tucak Junaković et al. [38] was conducted in Dalmatian counties and the City of Zagreb. According to the Organisation for Economic Cooperation and Development (OECD) report [42] the City of Zagreb represents the most productive region in Croatia, while residents of Zagreb and, to a lesser extent, coastal areas tend to have higher incomes, higher educational attainment, and longer life expectancy than those living in other continental regions of Croatia. Such a context may provide a more supportive social environment for older adults, fostering greater social participation, more stable social networks, and a more positive experience of aging.

4.2. Urban–Rural Differences in Personal Wellbeing as the Subjective Dimension of Quality of Life

The subjective dimension of quality of life, measured using the Personal Wellbeing Index encompassing seven domains, showed notable differences between urban and rural areas. Participants residing in rural settings scored lower across most domains of subjective quality of life. These results align with the findings reported by Pekçetin et al. [43].

Health was rated significantly lower among participants from rural areas compared with those living in urban and suburban settings. Consistent with these findings, Jiang et al. [44] report that older adults in rural areas more frequently perceive their health as poor, experience higher rates of depressive symptoms, and encounter greater difficulties in functional abilities. As a result, functional decline tends to occur earlier in rural populations than in urban ones. These rural and urban differences are largely associated with the socioeconomic status of older adults [44].

Satisfaction with close relationships was rated significantly lower in rural areas. According to Iverson et al. [45], older adults in rural settings most often rely on family and friends as primary sources of support, particularly for practical daily needs, while formal services are less accessible. In contrast, participants from urban areas highlight broader access to formal and professional support resources, although some report lower satisfaction with social support and a weaker sense of safety in their neighborhoods. Social support is shaped by the specific characteristics of the environment, with older adults in rural areas relying more on informal networks and those in urban areas more on formal sources of help [45]. These differences should be considered when planning support for the older population.

A significantly lower level of satisfaction with safety and future security was observed in rural areas. In these settings, the quality and availability of services, including healthcare, may be limited, and environmental conditions and infrastructure, particularly their deterioration, can affect perceptions of safety [46]. Moreover, perceiving one's immediate environment as safe is crucial for maintaining quality of life in older adulthood [39]. Feelings of insecurity among older adults are often linked to neighborhood problems and reduced trust in other residents. Those facing the most pronounced neighborhood issues report greater insecurity both in their surroundings and within their own homes, as well as an increased fear of crime [47]. Together, these findings underscore the important role of the immediate environment in shaping older adults' subjective sense of safety.

Lower perceived life achievement among older adults reflects the combined effects of multiple interrelated factors accumulating across the life course. Older adults in rural settings often experience reduced social functioning and higher levels of social isolation, frequently linked to limited transportation options and fewer opportunities for participation in social and community activities [48]. These social constraints are accompanied by a higher burden of chronic conditions, more pronounced depressive symptoms, and greater memory difficulties, all of which are strongly associated with lower quality of life [48]. Furthermore, educational attainment in rural populations is often lower compared with urban counterparts, while higher education has consistently been associated with better quality of life and lower levels of disability in later life [49]. From a life-course perspective, these disadvantages are not isolated but accumulate over time, as conceptualized in cumulative advantage/disadvantage theory [50]. Individuals residing in rural areas may face limited educational and occupational opportunities, lower income, and restricted access to health and social services throughout their lives. Such prolonged exposure to socioeconomic adversity may contribute to lower perceived life achievement among rural older adults. Taken together, these findings suggest that lower self-rated life achievement in rural older adults is likely the product of interacting social, health, educational, and cumulative socioeconomic disadvantages.

Community belonging in rural areas is shaped by both structural constraints and social dynamics. Although rural areas are often characterized by a strong sense of mutual connectedness and greater perceived support within the local community [51], and longer-term residence contributes to stronger relationships with community members, better knowledge of the neighbourhood, and a stronger sense of belonging [52] rural participants in the study reported lower levels of perceived community participation. This discrepancy can potentially be explained by structural constraints, such as greater physical isolation due to limited transportation and fewer

opportunities to engage in social activities [48]. Additionally, increased migration among newer generations modifies the social composition of rural communities; the absence of neighbours during the day negatively affects older adults' perception of belonging [51]. Economic and infrastructural limitations in rural areas further reduce opportunities for participation in organized activities [22] providing additional context for understanding the study findings. Neville et al. [53] emphasize that engagement in a rural community depends on the interconnection between physical and social environments, with transportation being a key factor for older adults' ability to engage, a resource that is often less adapted to their needs in rural areas. Thus, differences in perceived community belonging between urban and rural settings can be interpreted within the context of interactions between resource availability and specific social relationships, both of which shape older adults' sense of inclusion in the community.

4.3. Urban–Rural Differences in Successful Aging and Quality of Life

Lower levels of SSAS and well-being as a component of subjective quality of life among rural participants are the result of multiple factors. Song et al. [22] note that slower economic development in rural regions, combined with limited access to key resources that support an enabling environment for older adults, such as communal spaces, recreational facilities, and healthcare services, restricts their opportunities. Economic constraints in these areas reduce work and social opportunities, leading to less frequent participation in organized activities [22]. Limited access to transportation further reduces opportunities to utilize healthcare, social, and recreational services [54]. Older adults' willingness and ability to travel to healthcare services are influenced by age, socioeconomic status, and transportation challenges, including mode of transport, costs, safety, and availability of public transit [55], which are often more pronounced in rural regions. Additionally, research suggests a higher prevalence of chronic diseases, more depressive symptoms, and memory difficulties in rural areas [48]. These findings contrast with the theoretical model of successful aging [19], which emphasizes the preservation of physical, cognitive, and social functioning along with the maintenance of high quality of life, as rural participants exhibited lower levels across all these domains. This discrepancy helps explain the lower self-rated successful aging observed among participants living in rural areas. Regression analyses further showed that PWI is a strong predictor of SSAS, while rural residence and the presence of chronic illness is also independently contributed to lower SSAS scores. Moderation analyses showed that PWI predicts SSAS regardless of residence or chronic illness, suggesting that well-being consistently predicts perceived successful aging across different environmental contexts and in the presence of illness. Overall, these findings suggest that interventions aimed at enhancing well-being could help promote successful aging and warrant further investigation.

4.4. Psychosocial Dimensions: Community Involvement and Regret for Missed Opportunities and Past Actions

Active community involvement is positively associated with both higher quality of life and greater self-rated successful aging, emphasizing its role as a resource that allows older adults to actively influence their well-being and aging process despite differing life circumstances. Engagement in social and cultural activities reduces loneliness, depression, and anxiety, thereby enhancing overall functioning [56]. Conversely, regret, whether for missed opportunities or past actions, is linked to lower life satisfaction, poorer health outcomes [57,58], and reduced self-rated successful aging [59]. These findings highlight dual psychosocial pathways influencing successful aging. Active community participation supports well-being and adaptive aging, whereas life regrets represent a psychological barrier. Interventions that foster engagement and address sources of regret may therefore promote successful aging in later life [60].

4.5. Study Strengths, Limitations, and Recommendations

This study presents several strengths. It includes a sizable sample of older adults from both rural and urban areas, allowing robust comparisons across settings. The use of validated instruments to assess subjective well-being and self-rated successful aging enhances the reliability of the findings. Moreover, it provides novel insights into psychosocial and environmental determinants of successful aging within a region characterized by unique socio-cultural and demographic features. Despite these strengths, several limitations should be acknowledged. The cross-sectional design prevents causal inferences, and the regional focus on Eastern Croatia – Slavonia, with its specific socio-cultural and demographic characteristics, limits generalizability. Reliance on self-report questionnaires may introduce social desirability bias. Future research should adopt longitudinal designs, expand to other regions, combine quantitative and qualitative methods, and include comparative groups of older adults residing in institutional settings to gain a more comprehensive understanding.

5. Conclusions

This study provides evidence of significant urban–rural disparities in subjective quality of life and self-rated successful aging among older adults in Eastern Croatia–Slavonia. Older individuals residing in rural areas consistently reported lower levels of well-being across multiple life domains, as well as lower overall perceptions of successful aging. These findings suggest that successful aging is shaped not only by individual health status but also by broader environmental and social conditions associated with place of residence. Subjective quality of life emerged as a central determinant of successful aging, explaining a substantial proportion of variance in self-rated successful aging. Although rural residence and the presence of chronic illness independently predicted lower successful aging scores, moderation analyses indicated that the positive association between subjective well-being and successful aging remained stable across residential contexts and health status. This underscores the robustness of subjective well-being as a core component of successful aging in later life. Importantly, psychosocial factors played a meaningful role in shaping both quality of life and successful aging. Active involvement in the community was positively associated with higher well-being across all domains, whereas regret related to missed opportunities and past actions was linked to poorer outcomes. These findings highlight the dual influence of adaptive and maladaptive psychosocial processes in later life and emphasize the importance of social participation and psychological resources in aging well. Taken together, the results point to the need for integrated public health and social policies that go beyond medical care and address social participation, psychological well-being, and structural inequalities, particularly in rural settings. Interventions aimed at enhancing community engagement, reducing social isolation, and supporting adaptive coping strategies may contribute substantially to improved quality of life and more successful aging among older adults, particularly in socioeconomically disadvantaged and rural contexts.

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Abbreviations

The following abbreviations are used in this manuscript:

| | |
|------|--|
| PWI | Personal Wellbeing Index |
| SSAS | Self-assessment of Successful Ageing Scale |
| IQR | Interquartile range |
| VIF | Variance inflation factors |

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