Annals of Gerontology and Geriatrics

Article Type: Research Article

Volume 1

Impact of primary care on health-related quality of life in older adults: Assessment using EuroQol-5D in an analytical case-control study

Josevte Carmona-Simarro*; Daniela Carrio-Mut
Department of Nursing, Faculty of Health Sciences, European University of Valencia, Spain.

***Corresponding author: Josevte Carmona-Simarro**, Department of Nursing, Faculty of Health Sciences, European University of Valencia, Building A, Paseo de la Alameda nº 7, 46010 Valencia, Spain.
Tel: +34-649-520-196;
Email: josevicente.carmona@universidadeuropea.es

Received: Jun 04, 2025; **Accepted:** Jun 19, 2025; **Published:** Jun 26, 2025

Annals of Gerontology and Geriatrics
www.annggr.org

Citation: Carmona-Simarro J, Carrio-Mut D. Impact of primary care on health-related quality of life in older adults: Assessment using EuroQol-5D in an analytical case-control study. Ann Gerontol Geriatr Res. 2025; 1(1): 1009.

Abstract

Purpose: To assess Health-Related Quality Of Life (HRQoL) in a group of cases attending primary care versus a group of controls not attending, analysing differences in their perception of physical, mental and social well-being.

Methods: Analytical case-control study. 30 cases (primary care) and 30 controls (not used in the last 12 months), matched for age, gender and geography. Sociodemographic, clinical and lifestyle data were collected. HRQoL was assessed using the EuroQol-5D (EQ-5D). Odds Ratios (OR) 95% CI were calculated and Fisher's and Mann-Whitney U tests were applied

Results: Odds ratio (OR)=0.74: patients attending primary care are less likely to have a better HRQoL than controls.

Conclusions: The sample includes cases with higher health needs and more impaired HRQoL relative to those individuals not requiring primary care.

Introduction

General context of the problem: Relevance of HRQoL

Health-Related Quality Of Life (HRQoL) is a key indicator in public health studies, as it allows for the assessment of the impact that health status has on the physical, psychological and social well-being of individuals, incorporating their subjective perspective. HRQoL is especially useful for monitoring the health of populations, identifying social inequalities, and assessing the effectiveness of health interventions and public policies [13].

Importance of assessing the impact of primary care on HRQOL

Assessment of the impact of primary care on HRQoL is essential due to the central role of primary care in health systems. Primary care acts as the gateway to the health system, providing accessibility, continuity and comprehensive care based on a biopsychosocial approach [9].

Brief description of the EuroQol-5D questionnaire as a validated tool for measuring HRQoL.

The EQ-5D questionnaire is a validated and widely used tool to measure HRQoL in various populations. This instrument consists of two main parts: a descriptive system and a VAS. The descriptive system assesses five key dimensions of health: mobility, self-care, activities of daily living, pain/discomfort and anxiety/depression. The Visual Analogue Scale (VAS) allows individuals to rate their health status on a scale from 0 (worst imaginable state) to 100 (best imaginable state) [5].

Previous studies on the use of the EuroQol-5D to assess HRQoL and its application in primary care.

Previous studies on the use of the EQ-5D to assess HRQoL have demonstrated its usefulness in a variety of settings, including primary care. This instrument has been used to measure the impact of diseases and treatments on HRQoL in patients with pathologies such as low back pain, bronchitis and knee osteoarthrosis, showing sensitivity to changes in health status resulting from medical interventions: heart failure [14], COVID [1,8] post critical [2,13].

Justification of the study

The rationale for this study lies in the need to further explore the impact of primary care on HRQOL in older people, which is crucial for improving health outcomes and promoting health equity.

Target

Assessment of HRQOL in a group of cases attending primary care versus a group of controls who do not use these services, analysing the differences in their perception of physical, mental and social well-being, as well as the biopsychosocial factors associated with their health status and access to health care.

Methods

Study design

Observational Analytical Case-Control Study. The CONSORT guideline [12] was used.

Context

Recruitment was performed between 1 and 30 November 2024 in three urban health centres in the city of Valencia, Spain, outside the institution. The 30 cases (patients exposed to primary care interventions) and 30 controls (without recent exposure to these services) were selected by consecutive sampling, with inclusion criteria based on geographical accessibility. Data collection was performed using a questionnaire of sociodemographic variables and the EQ-5D questionnaire in its validated version for the Spanish population (Herdman et al, 2013). The process included an informed consent phase with a protocolised explanation of the objectives of the study, ensuring confidentiality in accordance with data protection regulations. The Methodological design contemplated a period of exposure to primary care of at least 6 months prior to the study, with cross-curricular assessment of results.

Participants

Eligibility criteria: The cases selected were patients from the general population attending the primary care service (first level of care) in Valencia (Spain) for any alteration or illness, without the specific cause or other health aspects related to their access to the health system being determined. These cases included persons of legal age, of both genders, and were matched by gender, leaving other clinical factors for later analysis. Controls were drawn from the same source population that originated the cases, thus ensuring the internal validity of the study. These controls were users who had not used primary care services in the last 12 months prior to passing the questionnaire, which allowed us to verify that they had no association with the exposure studied. In addition, it was ensured that they had a similar socio-demographic profile to the cases (homogeneity in Core characteristics) and were also matched by gender to maintain comparability between the two groups.

In this study, 30 cases and an equal number of controls were selected, establishing a 1:1 matching ratio. This approach allowed us to maintain homogeneity between groups, minimising potential confounding factors and strengthening the internal validity of the analysis.

Variables and data sources

The variables considered in the study encompassed sociodemographic aspects, clinical factors and lifestyles, providing a comprehensive framework for analysis. Sociodemographic variables included marital status, number of cohabitants, role as primary caregiver, and number of children. For clinical factors, the most limiting diagnosis, the presence of comorbidities, the number of drugs prescribed, the number of hospital admissions and the duration of these (days of admission) were assessed. Lifestyle was analysed through smoking and physical activity.

On the other hand, key confounding variables that could influence both exposures and outcomes were identified: age, gender and the presence of comorbidities. Finally, chronic comorbidities were considered as effect modifying variables, as these may alter the relationship between exposures and HRQoL, modulating their impact depending on the severity or type of chronic disease present.

Response variables (dependent): HRQOL. Assessed using the EQ-5D index, which combines the scores of the 5 dimensions of the questionnaire (mobility, self-care, activities of daily living, pain/discomfort and anxiety/depression). It also includes the VAS, where participants rate their health status on a scale from 0 to 100, with 0 being the worst imaginable and 100 the best.

Bias

To ensure the validity of the results and address potential sources of bias, several rigorous measures were implemented throughout the study. Cases were selected according to clear and precise diagnostic criteria, while controls were drawn from the same source population, reducing selection bias. In addition, matching by key variables such as age, gender and geographic location was performed, ensuring comparability between groups and minimising systematic differences. To avoid measurement bias, the validated EQ-5D questionnaire was used along with uniform protocols for the assessment of variables in both groups, ensuring that differences in measurement quality did not influence the results. Surveyors were trained to avoid subjective influences during data collection and worked under a blinding scheme, not knowing whether participants belonged to the case or control group.

Sample size

The sample size was determined with the aim of exploring the feasibility of the design, identifying potential methodological issues and obtaining preliminary estimates of key parameters such as exposure frequencies and odds ratios. As this was a pilot study, the aim was not to achieve high statistical power, but to generate initial data to inform the planning of a larger study. Sample size selection was based on practical criteria, such as availability of participants, following an exploratory approach to ensure reliable initial estimates. A 1:1 case-control ratio (30 cases and 30 controls) was adopted, a common strategy in pilot studies that facilitates statistical analysis and ensures comparability between groups. In addition, the data obtained, such as the observed exposure frequencies in both groups, will be useful to calculate more accurately the sample size needed in subsequent, more robust research.

Quantitative variables

Quantitative variables were analysed using appropriate statistical procedures to ensure the validity of the results and comparability between groups. The main quantitative variable considered was the VAS, which assesses the health status perceived by the participants on a scale from 0 to 100, where 0 represents the worst imaginable health status and 100 the

best. This variable was treated as continuous in the analysis, in order to preserve all the richness of its information and to allow a more accurate assessment of the differences between the groups studied.

Statistical methods

The statistical methods employed included the calculation of OR as the main measure of association, with 95% confidence intervals and a significance level set at $p<0.05$. In the descriptive analysis, categorical variables were summarised using absolute frequencies and percentages, while continuous variables were analysed using measures of central tendency (mean) and dispersion (standard deviation). For the inferential analysis, specific tests were applied according to the type of variable: the Chi-square test or Fisher's exact test for categorical variables, and the Mann-Whitney U test for continuous variables, given that the assumptions of normality were not met for all variables.

Sensitivity analyses were performed to assess the robustness of the results by testing different scenarios, such as excluding cases with incomplete data or modifying the inclusion criteria for controls. This allowed us to verify whether the observed associations were consistent under different analytical conditions.

Results

A total of 60 participants were included in the study, divided into two groups: 30 subjects in the case group and 30 in the control group. After applying the inclusion and exclusion criteria, the aforementioned 60 participants were confirmed as eligible. All subjects included in the study completed the full follow-up, with no losses in the process.

Univariate analysis

Case group: Socio-demographic characteristics. Regarding gender, 50% were men and % were women. The mean age was 81.73±4.13 years, with a range between 75 and 91 years. Forty-three percent were married and 46.4% were widowed. Forty percent lived with their partner compared to 30% who lived alone. The family type caregiver ranked first with 83.3%.

Clinical characteristics: The most limiting diagnosis was chronic pain, with 46.7%, followed by acute illnesses with 13.3% and cognitive illnesses with 10%. Specifically, lower limb pain was present in 33.3%, followed by respiratory tract infections with 10% and others in smaller proportions related to urinary incontinence and emotional problems. 90% had some degree of HTN, 23.3% had DM, 13.3% had obesity and 80% had dyslipidaemia.

In relation to medication use, the average for the sample of subjects was 8.4 medications, with a range between 1 and 20.

Hospital admissions occurred in 30% of the cases at least once, although 70% claimed not to be recent admissions. 3.3% claimed to have been admitted up to three times. Days of hospitalisation ranged from 3 days to prolonged stays of 25 days.

With regard to habits, only 10% currently smoked and 73.3% reported some degree of physical activity.

According to the specific dimensions of the EQ-5D questionnaire:

- Mobility. 63.3% report moderate problems, while *36.7%* have no problems.
- Personal care. The majority, 66.7%, have no problems; however, 30% report moderate problems and 3.3% report severe problems.
- Activities of daily living. 53.3% have no problems; however, 40% report moderate and 3.3% severe problems.
- Pain/discomfort. Some 60% have moderate and 13.3% severe problems; only 26.7% report no problems.
- Anxiety/depression. 40% have no problems, 40% have moderate problems and 20% have severe problems.

Perceived quality of life, VAS: the average score in the case group (range 0-100) was 66.7±2.51.

Group of controls

Socio-demographic characteristics. Regarding gender, 56.7% were men and 43.3% women. The mean age was 81.13±3.97 years, with a range between 75 and 90 years. 26.6% were married and 46.7% widowed. 23.3% lived with their partner compared to 16.7% living alone. The family type caregiver was in first place with 80%.

Clinical characteristics: The most limiting diagnosis was chronic pain, with 16.7%, followed by cognitive alterations with 20%. A total of 16.7% reported no limitations. Of these, 90% had some degree of hypertension, 16.7% had DM, 10% had obesity and/or dyslipidaemia, 86.7% had dyslipidaemia, and 16.7% had DM.

Hospital admissions occurred in 36.7% of cases, at least once, although 73.3% claimed not to have been admitted recently. 3.3% claimed to have been admitted up to three times. Days of hospitalisation ranged from 3 days to prolonged stays of 19 days.

With regard to habits, only 36.7% currently smoked and 80% reported some degree of physical activity.

According to the specific dimensions of the EQ-5D questionnaire:

- Mobility. 63.3% report moderate problems, while 36.7% have no problems.
- Personal care. The majority, 70%, have no problems and 30% report moderate problems.
- Activities of daily living. 33.3% have no problems and 63.3% report moderate problems.
- Pain/discomfort. 66.7% have moderate and 10% severe problems; only 23.3% report no problems.

Anxiety/depression. 50% have no problems, 36.7% have moderate problems and 13.3% have severe problems.

Perceived quality of life, VAS: the average score in the control group (range 0-100) was 77.3±1.81.

Other analysis: ODDS RATIO

The OR was 0.74, so patients attending primary care have an OR of 0.74 compared to controls, indicating that they have a lower relative probability of having a better HRQoL compared to those who do not need to go to the health centre. This suggests that we are dealing with a sample of cases with greater health needs and a more deteriorated HRQoL compared to those individuals who do not require medical attention at the primary health care level.

Bivariate analysis

P-values <0.05 were obtained for each of the EQ-5D variables between cases and controls, so there are statistically significant differences between the constructs (Table 1).

Table 1: Cross-tabulations of Eq-5D categories between cases and controls.

Variable	Statistician	*P value*
Mobility	Fisher's exact test	*0.001*
Personal care	Pearson's Chi-square	*0.000*
Daily activities	Pearson's Chi-square	*0.000*
Pain	Pearson's Chi-square	*0.000*
Anxiety	Pearson's Chi-square	*0.000*

Mann-Whitney U test

To assess statistically significant differences between the VAS of the case group and the control group, the Mann-Whitney U statistic was performed. The mean VAS of the cases was 66.7.3±2.51 (standard error measure 0.46) and that of the controls was 77.3±1.81 (standard error measure 0.33). In the paired samples correlation, a correlation index (r) of 0.399 was obtained with a p-value of 0.029. The Mann-Whitney U test showed the following results (Table 2). Statistically significant differences were obtained between the VAS of the case group and the controls, *p=0.024*.

Table 2: Paired samples test.

Par	Lower IC	Upper IC	t	gl	*P value*
EVA CA / EVA CO	-1.972	-0.1478	-2.377	29	*0.024*

Discussion

Main results of the study objectives

The case group consisted of older adults with a high average age (81 years) and complex clinical features due to comorbidities such as hypertension, dyslipidaemia and chronic pain. Most are dependent on family care and face functional limitations related to mobility, activities of daily living and self-care, as well as significant levels of pain and emotional distress. Although a considerable proportion are physically active (73%), high levels of polypharmacy (average of more than eight medications) reflect the medical burden associated with this group. The control group shows better functional indicators and lower clinical burden compared to the case group, especially in terms of mobility, self-care and regular physical activity. However, both groups share common characteristics such as high prevalence of HTN, dyslipidaemia and significant levels of pain/discomfort affecting their perceived quality of life. These results are consistent with the typical characteristics of a geriatric population with multiple clinical and social needs, highlighting the importance of integrated management to improve their quality of life and daily functionality.

The results between the crosstabs of the EQ-5D categories between cases and controls have shown a significant association (p<0.05). This implies that the presence of severe, moderate or no problems are different in these groups.

A significant difference was obtained between the VAS scores of cases and controls (p<0.05). This implies that cases have a significantly lower score compared to controls. Furthermore, the confidence interval reinforces this conclusion, as it does not include the zero value. In practical terms, these results suggest that the variable assessed (VAS) differs significantly between the case and control groups, which presents relevant implications depending on the context of the study.

Limitations

The main limitations are related to selection bias, given that cases and controls may not be representative of the general population and could underestimate or overestimate the association between attending primary care or not, for that reason this study is established as a pilot and exploratory study, giving way to a new research with a representative sample. Measurement bias, related to the information collected, and which tends to differ between cases and controls, has been minimised, given that the questionnaire used has few items. Researcher bias has also been minimised by blinding the data collection, as the researcher is an outsider to the research.

Interpretation

The data presented reflect a comparative analysis of older adults in two groups: cases with higher clinical and functional burden, and controls with better health indicators.

With regard to the clinical and functional characteristics of the group of cases, a high average age of 81 years was observed, with multiple comorbidities, such as arterial hypertension, dyslipidaemia and chronic pain. Likewise, a high dependence on family care due to functional limitations in mobility, daily activities and personal care. Significant polypharmacy is associated with an average of more than eight medications, reflecting a high medical burden. And although 73% are physically active [4], levels of pain and emotional distress are high, affecting their perceived quality of life [7].

With regard to clinical and functional characteristics, the control group showed better general functionality, especially in terms of mobility, personal care and regular physical activity. In this case, less clinical burden compared to the case group, although they share high prevalences of hypertension, dyslipidaemia and pain/discomfort (National Academies of Sciences, Engineering, and Medicine, 2021).

The results underline the clinical complexity of the case group compared to controls. Polypharmacy [3], and functional limitations [11] are clear indicators of negative impact on quality of life in cases, while controls present a more favourable profile.

In relation to Perceived Quality of Life, a significant association was found between the EQ-5D categories and the two groups (p<0.05). This indicates that the severity or absence of problems differed between cases and controls. VAS scores were significantly lower in the case group (p<0.05), reinforcing the perception of a poorer quality of life in this group.

These differences reflect how clinical conditions negatively affect the subjective perception of well-being in the case group. The significant association suggests that interventions should focus on improving functionality and reducing emotional distress.

Conclusions

The results highlight the complex needs of the geriatric

group with high clinical burden. Polypharmacy, functional limitations and emotional distress significantly impact their quality of life. On the other hand, although controls present better indicators, they share common challenges such as chronic comorbidities. This reinforces the importance of integrated management focused on: reducing polypharmacy through regular Assessments, promoting personalised physical activity programmes and addressing emotional distress to improve subjective perception of well-being. This approach can contribute to optimising daily functioning and perceived quality of life in this vulnerable population.

General

Generalisation of these results to other geriatric populations should be considered with caution due to the following limitations: the specificity of the clinical and social profile of the group studied, potential differences in healthcare systems and cultures, and methodological restrictions such as inclusion and exclusion criteria. To improve external validity, future studies could: expand the sample to include older adults with different age and clinical profiles, assess populations in diverse geographical and cultural contexts, and design studies with less restrictive criteria to capture greater diversity.

References

1. Armas A, Santana Ayala JR, Román Castillo Y, Hardisson de la Torre A, Rubio Armendáriz C. Quality of life assessment in patients using benzodiazepines during the COVID-19 pandemic in a community pharmacy using Euroqol 5D-3L. Pharmacy. 2023; 11: 19.
2. De Silva S, Neto AS, Sathe A, Higgins AM, Hodgson CL. The psychometric properties of the EuroQol 5D five level in survivors of critical illness. Crit Care Med. 2025; 53: e151–60.
3. Dovjak P. Polypharmacy in elderly people. Wien Med Wochenschr. 2022; 172: 109–13.
4. El Assar M, Álvarez-Bustos A, Sosa P, Angulo J, Rodríguez-Mañas L. Effect of physical activity/exercise on oxidative stress and inflammation in muscle and vascular aging. Int J Mol Sci. 2022; 23: 8713.
5. Feng YS, Kohlmann T, Janssen MF, Buchholz I. Psychometric properties of the EQ-5D-5L: a systematic review of the literature. Qual Life Res. 2021; 30: 647–73.
6. Gutiérrez-Valencia M, Herce PA, Lacalle-Fabo E, Escámez BC, Cedeno-Veloz B, Martínez-Velilla N. Prevalence of polypharmacy and associated factors in older adults in Spain: data from the National Health Survey 2017. Med Clin (Barc). 2019; 153: 141–50.
7. Hajek A, Kretzler B, König HH. Determinants of frequent attendance in primary care: a systematic review of longitudinal studies. Front Med (Lausanne). 2021; 8: 595674.
8. Hegde S, Sreeram S, Bhat KR, Satish V, Shekar S, Babu M. Evaluation of post-COVID health status using the EuroQol-5D-5L scale. Pathog Glob Health. 2022; 116: 498–508.
9. Kunvik S, Kanninen JC, Holm A, Suominen MH, Kautiainen H, Puustinen J. Nutritional status and health-related quality of life among home-dwelling older adults aged 75 years: the PORI75 study. Nutrients. 2024; 16: 1713.
10. National Academies of Sciences, Engineering, and Medicine. Implementing high-quality primary care: rebuilding the foundation of health care. Washington (DC): National Academies Press. 2021.
11. Puto G, Repka I, Muszalik M. Factors correlating with functional capacity in older people with chronic pain. Int J Environ Res Public Health. 2023; 20: 2748.
12. Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. J Pharmacol Pharmacother. 2010; 1: 100–7.
13. Sharshar T, Grimaldi-Bensouda L, Siami S, Cariou A, Salah AB, Kalfon P, et al. A randomized clinical trial to evaluate the effect of post-intensive care multidisciplinary consultations on mortality and the quality of life at 1 year. Intensive Care Med. 2024; 50: 665–77.
14. Ventoulis I, Kamperidis V, Abraham MR, Abraham T, Boultadakis A, Tsioukras E, et al. Differences in health-related quality of life among patients with heart failure. Medicine (Baltimore). 2024; 60: 109.