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Influence of social determinants of health on quality of life in patients with multimorbidity and polypharmacy

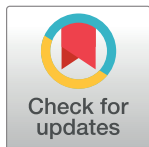José María Ruiz-Baena[1‡], Aida Moreno-Juste[2,3,4‡*], Beatriz Poblador-Plou[2,4], Marcos Castillo-Jimena[5,6,7], Amaia Calderón-Larrañaga[4,8], Cristina Lozano-Hernández[4,9,10], Antonio Gimeno-Miguel[2,4‡], Luis A. Gimeno-Feliú[2,3,4,11‡], MULTIPAP GROUP[¶]

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Abstract

Background

Multimorbidity is one of the biggest challenges faced by modern medicine, especially when managing older patients who are also often taking multiple medications. Multimorbidity is influenced by social determinants of health, giving rise to health inequalities in the population. Here, we sought to determine the influence of social determinants of health on quality of life in patients with multimorbidity and polypharmacy.

Methods and materials

This cross-sectional observational study included 573 patients aged 65–74 with multimorbidity (≥3 diseases) and polypharmacy (≥5 drugs). Corresponding data was taken drawn from the Spanish MULTIPAP study, and included social and demographic variables, and data on health-related quality of life and overall self-perceived health status, assessed using the 5-level version of the EuroQol 5-dimensional questionnaire (EQ-5D-5L). Descriptive, bivariate and multivariate analyses with logistic regression models were performed.

Results

Mean patient age was 69.7 years, 55.8% of patients were female, 59.7% belonged to low social classes (V, VI), a monthly income of €1051–€1850 predominated, and the median number of diseases in the same patient was 6. Factors associated with higher quality of life were (odds ratio, OR) male gender (OR = 1.599, p = 0.013), a higher educational level (OR = 1.991, p = 0.036), an absence of urban vulnerability (OR = 1.605, p = 0.017), and the presence of medium social support (OR = 1.689, p = 0.017). Having a higher number of diseases was associated with poorer quality of life (OR = 0.912, p = 0.017).

Conclusions

Our findings describe associations between social determinants of health and quality of life in patients aged 65–74 years with multimorbidity and polypharmacy. More illnesses, female gender, a lower education level, urban vulnerability, and less social support are associated with poorer quality of life, underscoring the need for a biopsychosocial approach in patient care.

Introduction

The last century has seen an unprecedented increase in human life expectancy. Inherent to this phenomenon is a parallel increase in the prevalence of chronic diseases for which old age is a key risk factor, including hypertension, arthrosis, and diabetes [1]. Multimorbidity, defined as the coexistence of several chronic diseases in the same patient [2], affects an estimated 81.5% of individuals aged ≥85 years, 62% of those aged 65–74 years, and 50% of those aged >65 years [3]. Coexistence of several chronic diseases is a very common phenomenon, and has turned multimorbidity into one of the greatest challenges facing modern healthcare systems.

Due to the potential fragmentation of their care between different specialties and the use of multiple disease-specific guidelines in their treatment, patients with multiple long-term conditions are in most cases prescribed several drugs. The resulting polypharmacy, defined as the use of multiple medicines, is not always appropriate. Inappropriate polypharmacy has been shown to increase the risk of adverse drug reactions and drug-drug and drug-disease interactions, all of which are some of the causes of the great impact of multimorbidity on patients' health outcomes [4, 5].

Some studies have demonstrated exponential increases in disability when the number of chronic diseases increases, and have characterized the effects of multimorbidity on health outcomes such as physical functioning, mental health, and quality of life [6]. Health-related quality of life (HRQoL) is a multi-dimensional concept used to examine the impact of health status on quality of life, and can be measured in several ways, both objective and subjective. It also includes the self-perception of the individual's living situation, and their attitudes towards modifying and improving their conditions in relation to their goals, expectations, values and interests [7].

The mechanisms underlying multimorbidity are diverse and complex. On the one hand are biological factors inherently related to the aging process itself, including gender, cellular senescence, stem cell aging, and DNA methylation. On the other hand, there are factors such as lifestyle (e.g., diet, sedentarism, sleep quality, use of harmful substances like alcohol or other

drugs), social and community-related variables (e.g., social support, loneliness, adverse child-hood experiences), and work conditions, all of which are conditioned by cultural, environ-mental and socio-economic factors (urbanism, educational level) [8].

Although multimorbidity relates to the presence of diseases, it should not be viewed solely from a biomedical perspective, and requires a biopsychosocial, patient-focused approach. Primary care can play a central role in orchestrating a multifactorial approach to the management of pluri-pathology, with the goal of maximizing patient quality of life and minimizing potential morbidity and disability [5]. Considering how social factors influence these variables is essential to help achieve this goal.

Social determinants of health (SDH) are defined as the conditions in which people are born, grow, work, live, and age, including a combination of socio-economic, environmental, community and work-related factors, apart from those related to healthcare systems. Historically, SDH have been one of the main sources of societal inequities [9]. A better understanding of the relationship between SDH and health outcomes in older patients with multimorbidity and polypharmacy is essential to help improve quality of care of these patients. The aim of this study was to examine how SDH influence quality of life in primary care patients aged 65–74 with multimorbidity.

Materials and methods

Design and setting of the study

We conducted a descriptive cross-sectional study using baseline information recorded for participants enrolled in the MULTIPAP cluster-randomized controlled trial (RCT) (clinical trial registration number NCT02866799), which sought to improve drug prescription in young-old adults with multimorbidity and polypharmacy through a complex intervention in primary care. A detailed description of the design, methods, and intervention of the MULTIPAP trial has been published elsewhere [10].

Briefly, the MULTIPAP RCT involved the voluntary participation of 117 family physicians who recruited a total of 573 patients from 38 Spanish primary care health centres in three different regions (Andalucía, Madrid, and Aragón) between November 8, 2016, and January 31, 2017 [11]. Patients were randomly included in the study if they were aged 65–74 years, had multimorbidity (defined as the presence of three or more chronic diseases [12]) and polypharmacy (defined as taking five or more different drugs during the preceding three months), had visited their family doctor at least once in the preceding year, and were able to follow the study requirements. Institutionalized patients and those with a life expectancy of less than 12 months and/or with a disease that in their physician's opinion would not allow them to follow the study requirements were excluded. The recruiting physicians provided the patient with detail information about the study, they confirmed the patient´s eligibility and obtained the patient´s written informed consent. From the 636 patients initially contacted, 63 were excluded because refused to participate in the RCT (n = 22), did not meet inclusion criteria (n = 20), did not sign the informed consent (n = 1), or did not attend the baseline patient consultation despite having signed the informed consent (n = 20). The trial was designed in accordance with the basic ethical principles of beneficence, autonomy, non-maleficence and justice, and it was conducted in accordance with the rules of Good Clinical Practice outlined in the Oviedo Convention (1997) and the most recent Declaration of Helsinki. Written informed consent of patients was required. Data confidentiality and anonymity was ensured, according to the provisions of Spanish Law 15/1999, both during the implementation phase of the project and in any resulting presentations or publications.

This study, as well as the written model form, was approved by the Clinical Research Ethics Committees of Aragón (CEICA, PI15/0217) and was favourably evaluated by the Research Ethics Committee of the Province of Malaga and by the Central Committee of Primary Care Research of the Community of Madrid.

Study variables

All data were obtained through face-to-face surveys during baseline patient consultations and recorded using an electronic case report form. The information recorded for each patient is indicated below.

Independent variables included for each patient were as follows: date of birth; gender; nationality; marital status; family composition; housing indicators; self-perceived disturbances in the neighbourhood; social class, divided into six categories from I (highest) to VI (lowest) according to the Spanish 2017 National Health Survey and then dichotomized into high (I through IV) and low (V and VI); educational level according to the Spanish 2011 Statistical Office´s Population and Housing Census questionnaire [13]; occupation according to the Spanish Classification of Occupations CNO–11 [14]; socioeconomic status assessed based on monthly net income per household, expressed as multiples of the minimum wage; self-perceived social support measured using the Spanish version of the Duke Unc-11 Functional Social Support (DUFSS) questionnaire [15]; and the number of chronic conditions registered in the patient's electronic health records. Chronic conditions were considered as such based on the study by O'Halloran et al. [12], and were originally coded based on the International Classification for Primary Care. A list with all the chronic diseases considered for this study is provided in S1 Table.

Health-related quality of life and overall self-perceived health status, measured using the 5-level version of the EuroQol 5-dimensional questionnaire (EQ-5D-5L), was assessed as a dependent variable. The EQ-5D-5L considers five dimensions (mobility, self-care, daily activities, pain/discomfort, and anxiety/depression), and requires patients to rate their level of impairment for each item (five levels, from 1 [no problems] to 5 [being unable to do/having extreme problems]). According to the responses to each item, an overall index score (ranging from 0–1) was calculated for each patient using the EQ-5D-5L Crosswalk Index Value Calculator. This calculator is available on the EuroQol website and provides validated results for the Spanish population obtained from a matrix of transition probabilities between health states [16].

Statistical analysis

We described the characteristics of the study population as frequencies and/or the mean and standard deviation (sd). Subsequently, we analysed the distribution of patient quality of life according to the study variables. The Kolmogorov-Smirnov test indicated that quality of life followed a non-normal distribution. Therefore, the Mann Whitney U-test and the Kruskal-Wallis test were used for comparisons between 2 and >2 groups, respectively. In the case of the Kruskal-Wallis test, the Dwass-Steel-Critchlow-Fligner post-hoc test was performed for all variables for which statistical significance was found, to determine the specific pairs of variables for which the differences were significant. Results were expressed as the median and corresponding interquartile range (IQR).

Finally, we conducted a multivariate analysis to test the association between independent study variables and patient quality of life, using a logistic regression model for the EQ-5D-5L scale. To this end, the EQ-5D-5L variable was transformed into a dichotomised variable with two possible outcomes (low/high), depending on whether the patient's score was below or

above the median, respectively. This categorization was performed to obtain homogeneous groups.

All statistical analyses were conducted in STATA software (Version 17.0, StataCorp LLC, College Station, TX, USA) and Jamovi (Version 2.3.5) [17].

Results

The main sociodemographic characteristics of the study population are shown in Table 1. Mean age was 69.7 years, and 55.8% of patients were women. A large portion of the sample (59.7%) corresponded to low social classes (V, VI). Monthly income was classified as medium

Table 1. Main sociodemographic characteristics of the study population.

n	573
Age (mean (SD))	69.69 (2.68)
Gender, female (n, %)	320 (55.8)
Nationality, Spanish (n, %)	564 (98.4)
Marital status (n, %)	
Married	433 (75.6)
Separated	27 (4.7)
Single	23 (4.0)
Widower	90 (15.7)
Educational level (n, %)	
Did not complete primary studies	264 (46.1)
Completed primary studies	235 (41.0)
Degree or higher	74 (12.9)
Occupation (n, %)	
Elementary occupations	223 (38.9)
Essential sectors	241 (42.1)
Technicians, office employment	109 (19.0)
Social class (n, %)	
I—Professional occupations	35 (6.1)
II—Managerial and technical occupations	26 (4.5)
III—Skilled non-manual occupations	75 (13.1)
IV—Skilled manual occupations	95 (16.6)
V—Partly skilled manual occupations	205 (35.8)
VI—Unskilled manual occupations	137 (23.9)
Monthly income (n, %)	
Low—≤€1050	163 (28.4)
Medium—€1051–€1850	244 (42.6)
High—≥€1851	145 (25.3)
Unknown	21 (3.7)
Home size (m^2), mean (SD)	94.03 (43.39)
Lives alone, yes (n, %)	101 (17.6)
Number of cohabitants, mean (SD)	2.30 (0.68)
Urban vulnerability[1], yes (n, %)	203 (35.6)
EQ-5D-5L, mean (SD)	0.77 (0.20)
Functional social support, mean (SD)	43.82 (8.75)
Number of diseases, median [IQR]	6.00 [4.00, 7.00]

[1]Patients reported having problems with at least 4 of the 9 items assessed

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Table 2. Number of patients with some type of problem for each of the five dimensions of the EQ-5D-5L questionnaire.

Variable (n, %[1])	Dimensions of the EQ-5D-5L questionnaire				
	Mobility	**Personal care**	**Daily activities**	**Pain/ Discomfort**	**Anxiety/ Depression**
Total	265 (48.0)	105 (19.0)	198 (35.9)	414 (75.0)	272 (49.3)
Gender					
Female	159 (51.0)	64 (20.5)	134 (42.9)	255 (81.7)	183 (58.7)
Male	106 (44.2)	41 (17.1)	64 (26.7)	159 (66.3)	89 (37.1)
Social class					
Low (I–IV)	166 (50.2)	73 (22.1)	131 (39.6)	260 (78.5)	176 (53.2)
High (V–VI)	99 (44.8)	32 (14.5)	67 (30.3)	154 (69.7)	96 (43.4)
Lives alone					
Yes	52 (51.5)	22 (21.8)	39 (38.6)	77 (76.2)	58 (57.4)
No	213 (47.2)	83 (18.4)	159 (35.3)	337 (74.7)	214 (47.5)
Urban vulnerability[2]					
Yes	113 (57.1)	45 (22.7)	84 (42.4)	159 (80.3)	106 (53.5)
No	152 (43.2)	60 (17.0)	114 (32.4)	254 (72.2)	166 (47.2)
Monthly income					
Low ≤€1050	85 (53.5)	33 (18.8)	65 (40.9)	127 (79.9)	93 (58.5)
Medium €1051–1850	113 (48.3)	41 (17.5)	81 (34.6)	180 (76.9)	118 (50.4)
High ≥€1851	57 (41.3)	26 (18.8)	45 (32.6)	92 (66.7)	52 (37.7)
Educational level					
Did not complete primary studies	124 (48.4)	49 (19.1)	92 (35.9)	207 (80.9)	134 (52.3)
Completed primary studies	120 (53.6)	45 (20.1)	88 (39.3)	159 (71.0)	111 (49.6)
Degree or higher	21 (29.2)	11 (15.3)	18 (25.0)	48 (66.7)	27 (37.5)
Occupation					
Elementary occupations	109 (50.5)	40 (18.5)	86 (39.8)	170 (78.7)	114 (52.8)
Essential sectors	110 (48.2)	44 (19.3)	74 (32.5)	175 (76.8)	113 (49.6)
Technicians, office employments	46 (42.6)	21 (19.4)	38 (35.2)	69 (63.9)	45 (41.7)
Marital status					
Married	194 (47.0)	73 (17.7)	142 (34.4)	304 (73.6)	188 (45.5)
Separated	13 (50.0)	7 (26.9)	11 (42.3)	20 (76.9)	14 (53.8)
Single	11 (47.8)	3 (13.0)	7 (30.4)	17 (73.9)	11 (47.8)
Widower	47 (52.2)	22 (24.4)	38 (42.2)	73 (81.1)	59 (65.6)
Social support					
Lower tertile	102 (53.1)	44 (22.9)	83 (43.2)	158 (82.3)	112 (58.3)
Medium tertile	81 (41.5)	33 (16.9)	60 (30.8)	134 (68.7)	80 (41.0)
Higher tertile	82 (49.7)	28 (17)	55 (33.3)	122 (73.9)	80 (48.5)

[1]. % refers to the total number of patients in each category of the variable analysed.

[2]. Patients reported having problems with at least 4 of the 9 items assessed

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(defined as a monthly salary of €1051–€1850) in the largest proportion of patients (42.6%). Finally, the median number of diseases in the same patient was 6 (IQR 4–7).

The number and proportion of patients with some type of problem for each of the five dimensions of the EQ-5D-5L questionnaire according to the different independent variables analysed is presented in Table 2. The dimension with the highest number of patients presenting some type of problem was pain/discomfort (75.0% of the patients had some problem), followed by anxiety/depression (49.3%), mobility (48.0%), daily activities (35.9%) and personal care (19.0%).

The results of the univariate analysis of the relationship between independent variables (analysed separately) and quality of life are shown in Table 3. Median quality of life was lower in women versus men; in patients from a low versus high social class; in patients in a situation of urban vulnerability; in patients with a low versus high monthly income; in patients with a lower educational level; and in patients with a lower level of social support.

Table 4 shows the results of the multivariate analysis that examined the association between quality of life and several social variables. The analysis identified the following statistically significant risk factors for worse quality of life (odds ratio [OR], p-value): female sex (OR = 1.599, p = 0.013); lower versus higher educational level (OR = 1.991, p = 0.036); a situation of urban vulnerability (OR = 1.605, p = 0.017); and low versus medium level of social support (OR = 1.689, p = 0.017). Furthermore, a higher number of diseases was associated with worse quality of life (OR = 0.912, p = 0.017).

Discussion

Main findings

We observed significant associations between several of the SDH studied and quality of life in patients aged 65–74 with multimorbidity and polypharmacy. Specifically, the following independent variables were correlated with poorer quality of life: female gender; lower educational level; living in a neighbourhood in a situation of urban vulnerability; a lower level of social support; and a higher number of concomitant diseases.

Comparison with other studies

While the literature highlights the importance of studying the influence of SDH on quality of life, data on this association in patients with multimorbidity are scarce. Lawson et al. [18] investigated the relationship between multimorbidity and quality of life using a score that combined both physical and mental health function, based on data collected in the Scottish Health Survey. In line with the present findings, those authors observed an association between poorer quality of life and (i) increasing number of comorbid diseases and (ii) greater economic deprivation. In contrast to our findings, they detected no significant influence of sex on quality of life.

Von dem Knesebeck et al. [19] also analysed the association between socioeconomic status and patient-reported outcomes, including HRQoL, in a cohort of patients aged 65–85 with multimorbidity. Among the socioeconomic variables studied, a correlation was found between a lower monthly income and poorer health status, in agreement with the present findings. However, the authors reported no significant correlations between health status and either occupation or educational level.

Park et al. [20] used the EQ-5D-5L scale to measure QoL in older patients, and observed that female sex and lower socioeconomic level were significantly associated with a lower EQ-5D-5L score. They thought that multimorbidity had higher negative impact in patients with lower socioeconomic status, as it may increase health services utilization and costs, worsening the health inequality. Another study of the relationship between educational level and quality of life [21] reported significant associations between worse quality of life and both low educational level and lower monthly income.

Greater feelings of loneliness have been related to poorer quality of life in elderly patients with multimorbidity [22]. Specifically, feeling of loneliness was found to influence the psycho-physical health of elderly individuals. This has been supported by other authors who have established that people with a small social network, negative feeling about the relationship and greater physical and functional impairments may be particularly vulnerable to being socially

Table 3. Quality of life (EQ-5D-5L) distribution according to social determinants of health: Results of the univariate analysis.

Variable	Median [IQR]	p-value
Gender		<0.001
Female	0.790 [0.659–0.887]	
Male	0.857 [0.744–0.911]	
Social class		0.005
Low (I–IV)	0.799 [0.662–0.910]	
High (V–VI)	0.838 [0.737–0.924]	
Lives alone		0.244
Yes	0.800 [0.653–0.910]	
No	0.818 [0.694–0.910]	
Urban vulnerability[1]		<0.001
Yes	0.769 [0.642–0.887]	
No	0.838 [0.711–0.910]	
Monthly income		0.004[2]
Low ≤€1050	0.799 [0.641–0.893]	
Medium €1051–1850	0.818 [0.694–0.910]	
High ≥€1851	0.846 [0.743–0.932]	
Educational level		0.005[3]
Did not complete primary studies	0.818 [0.692–0.910]	
Completed primary studies	0.800 [0.662–0.910]	
Degree or higher	0.877 [0.781–0.932]	
Occupation		0.075
Elementary occupations	0.817 [0.662–0.910]	
Essential sectors	0.818 [0.694–0.910]	
Technicians, office employments	0.841 [0.723–0.932]	
Marital status		0.083
Married	0.818 [0.699–0.910]	
Separated	0.756 [0.649–0.910]	
Single	0.781 [0.682–0.921]	
Widower	0.809 [0.600–0.857]	
Social support		<0.001[4]
Lower tertile	0.784 [0.649–0.874]	
Medium tertile	0.857 [0.740–0.919]	
Higher tertile	0.818 [0.694–0.910]	

[1]. Patients reported having problems with at least 4 of the 9 items assessed

[2]. After applying the corresponding post-hoc pairwise comparison, significant differences were observed between the *Low* and *High* groups (p = 0.003)

[3]. After applying the corresponding post-hoc pairwise comparison, significant differences were observed between the groups *Did not complete primary studies* and *Degree or higher* (p = 0.003), as well as *Completed primary studies* and *Degree or higher* (p = 0.01)

[4]. After applying the corresponding post-hoc pairwise comparison, significant differences were observed between the *Lower tertile* and *Medium tertile* groups (p <0.001)

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Table 4. Association between quality of life (EQ-5D-5L) and variables related to social determinants of health: Results of the multivariate analysis.

Predictor	OR	95% CI		p-value
		Lower	Upper	
Number of diseases	0.912	0.846	0.984	0.017
Gender				
Female	(ref)			
Male	1.599	1.104	2.317	0.013
Social class				
Low (I–IV)	(ref)			
High (V–VI)	1.101	0.737	1.646	0.638
Urban vulnerability[1]				
Yes	(ref)			
No	1.605	1.103	2.335	0.013
Monthly income				
Low ≤€1050	(ref)			
Medium €1051–1850	0.989	0.645	1.516	0.960
High ≥€1851	1.240	0.729	2.107	0.427
Educational level				
Did not complete primary studies	(ref)			
Completed primary studies	0.856	0.577	1.271	0.442
Degree or higher	1.991	1.048	3.783	0.036
Social support				
Lower tertile	(ref)			
Medium tertile	1.689	1.096	2.601	0.017
Higher tertile	0.948	0.598	1.504	0.822

Note. Estimates represent the log odds of "QoL EQ-5D-5L = High" vs. "QoL EQ-5D-5L = Low"

[1] Referred as having problems with at least 4 of the 9 items assessed

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isolated and lonely, worsening their quality of life. While the present study did not include any variables related to social loneliness, we observed a correlation between a lower level of social support and poorer quality of life. It should be necessary to promote psychosocial and multidimensional interventions to improve the perception of relationships between patients and family members, as they could promote a good quality of life [22].

As stated above, few studies have analysed the relationship between multimorbidity, SDH, and quality of life, highlighting the need for greater research in this area to better understanding the underlying contributing factors and the types of interventions required to address multimorbidity. Older patients with low socioeconomic status experience a 'double burden of disease'. They are at higher risk of multimorbidity and, compared with matched patients with a higher socioeconomic status, are worse off in terms of key outcomes such as functional status, health related quality of life, and self-rated health [19].

The relationship between socioeconomic factors and quality of life is influenced by psychosocial factors including self-efficacy, coping behaviours, social contacts, social support, and psychosocial stress; behavioural factors such as activity level, smoking, and alcohol consumption; and material factors including living conditions [19]. Although supporting scientific evidence is limited, interventions on SDH, specifically on psychosocial and lifestyle-related factors, applied at the patient level, may improve quality of life and physical function and it could help minimize multimorbidity [8]. A clinical trial is currently underway in Ireland to

evaluate the effectiveness of social interventions at the primary care level on patients' health in disadvantaged areas of the country, and in the preliminary results general practitioners recommended included in the selection criteria the psychosocial need of the patients [23].

SDH are undoubtedly key contributors to social inequity, which in turn arise as a consequence of sociopolitical and socioeconomic factors. They also generate vulnerabilities that affect all aspects of the individual's life, including health [9]. Moreover, synergies between different factors can exponentially increase the risk of multimorbidity, beyond their expected additive effects [24]. This is the reason why multimorbidity requires interventions that take into account the socioeconomic, psychosocial and behavioural determinants [8].

One such example is the association between lower quality of life and both socioeconomic level and deprivation index: this relationship is influenced by multiple factors, one of which is the "inverse care law" [25, 26]. This law reflects the fact that health service availability does not correspond to the greater needs of disadvantaged populations, resulting in insufficient health resources to manage patients' conditions. Furthermore, this effect can be exacerbated by the fact that disadvantaged social groups often have reduced personal capacity, community support [18], and access to healthy food [20], factors that could potentially mitigate the impact of multimorbidity.

Knowledge of the influence of social variables on health behaviours, and consideration by healthcare providers of patients' socioeconomic context, health-related quality of life, and preferences, can help ensure a more effective approach to the management of multimorbidity. Understanding of factors that influence quality of life can enable implementation of strategic measures based on SDH. Consideration of quality of life as perceived by the patient is also important to improve the care of elderly patients with multimorbidity, and to facilitate individualized therapy and increased involvement in self-care.

Strengths and weaknesses

A key strength of this study is the use of data derived from a multicentre study in which primary care professionals participated. The availability of these data enabled a broader assessment of participating patients, including data relating to a range of psychosocial variables that are frequently omitted from such studies (e.g. quality of life, social support, and urban vulnerability).

Limitations of this study are those intrinsically related to the measurement of social variables. Subjectivity in responses can lead to a higher degree of interpatient variability. Furthermore, it is difficult to separately analyse closely interrelated variables that are ultimately part of larger, multidimensional concepts. To maximise internal validity, we used the version of the DUFSS questionnaire validated for use in non-institutionalized elderly individuals [15], a population that closely corresponds to that of the present study.

Measurement of variables that may affect quality of life is important, as poorer self-perceived quality of life can be associated with poorer adherence to treatment, which in turn is related to greater urban vulnerability and lower functional support [27]. Other independent variables that may be related to quality of life but that were not considered in our analysis include psychosocial factors such as self-efficacy, coping behaviour, social contacts, and psychosocial stress, and behavioural factors such as physical activity, smoking, and alcohol consumption [19].

Regarding the definition of multimorbidity, it should be taken into account in the interpretation of the results obtained that in the RCT from which this study is derived we defined multimorbidity as the presence of three or more chronic conditions instead of using a cut-off point of two conditions that is usually used in the literature.

Lastly, limiting the study to patients aged 65–74 with multimorbidity can result in a loss of external validity if the results are extrapolated to the rest of the population. However, the population aged 65–74 corresponds to an increasingly larger stratum of the population, not only in Spain but in developed countries in general [27]. Furthermore, the large sample size and the fact that this study was conducted via coordinated efforts in three different regions in Spain lend greater validity to our findings in terms of potential for extrapolation to the broader population in this age range.

Conclusion

Our findings showed the association between SDH and quality of life in patients aged 65–74 with multimorbidity and polypharmacy. A greater number of illnesses, female gender, lower educational level, urban vulnerability, and reduced social support were all identified as variables associated with poorer quality of life in this population, underscoring the need for a biopsychosocial approach to the care of these patients. Consideration by healthcare professional of the socioeconomic context, quality of life, and living conditions of these patients can help ensure a more effective approach to the management of multimorbidity.

Supporting information

S1 Table. List of chronic conditions analysed for the definition of multimorbidity based on the study by O'Halloran et al.
(DOC)

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