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Effect of foot health-related quality of life in rural population: A case-control study

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ABSTRACT

Background: Foot health problems can affect quality of life and general health producing a source of discomfort and pain. Low levels of foot health-related quality of life (HRQoL) are present in patients with foot disabilities, such as hallux valgus, plantar fasciitis, or minor toe deformities.
Objective: The objective was to analyze the foot health status in patients with and without foot problems in a rural population and its relationship with quality of life.
Material and methods: A prospective case-control study was developed with a sample of 152 patients, 76 subjects with podiatric pathologies and 76 without, in a rural population. HRQoL was measured through the SF-36 Health Questionnaire in the Spanish version.
Results: The case group had a mean age of 49.18 ± 14.96 and the control group 44.16 ± 11.79. Regarding the score of the lowest levels of quality of life related to foot problems, the case group compared to the controls showed: for physical function (79.86 ± 26.38 vs. 92.63 ± 11 0.17, $p < 0.001$); for the physical role (73.68 ± 41.00 vs. 88.48 ± 27.51, $p < 0.0022$); for body pain (45.81 ± 27.18 vs. 73.68 ± 41.00, $p < 0.035$); and for general health (60.36 ± 30.58 vs. 68.71 ± 18.52, $p < 0.047$). The differences between groups were analyzed using the Mann-Whitney *U* test, which showed statistical significance ($P < 0.05$).
Conclusions: In the rural population, people with foot pathologies present a worse quality of life compared to those who do not present foot pathology, especially for the health domains: physical function, physical role, body pain and health general.

1. Introduction

The anatomical characteristics of the feet play an important role in posture and gait, due to the fact that they are responsible for autonomy, independence and well-being [1]. Currently, the prevalence of foot pathologies has been increasing, ranging between 61% and 79%, representing an important public health problem [2]. Foot disabilities are one of the most frequent reasons for consultation in primary care units, and many of these are chronic, decreasing the individual's ability to perform daily living activities, affecting balance and gait, and increasing the risk of falls [3,4].

In addition, these foot problems may show an increased prevalence in women and in older age groups >65 years [4,5], and present notable health problems related to obesity, diabetes, vascular disorders, depression, risk of falls and difficulty in putting on shoes [6].

Foot health is promoted in clinical practice settings in the urban environment; however it is unknown how foot health is promoted out of this context [7], due to rural working conditions. Furthermore, agricultural workers, such as those living in rural Korea, report a high prevalence of leg and foot pain [8]. As regards diabetic foot, some prior

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research has shown the influence of rural conditions in the development of diabetes mellitus complications [9].

Foot health-related quality of life impairments have been demonstrated in patients with foot problems with respect to specific foot structures, such as hallux valgus [10], plantar fasciitis [11], or minor toe deformities [12], as well as systemic diseases, such as breast cancer [13], diabetes [14], or rheumatoid arthritis [15]. Due to the necessity of foot care, the clinician's role is important to recognize and treat, or even prevent, additional injuries or deformities and teach patients about their disease, to achieve a better quality of life and state of well-being.

Despite the importance of foot pathologies, in both prevalence and impact on daily living activities, we have not found research on the influence of quality of life in people with foot pathologies in the rural environment compared to healthy subjects and, specifically, which facets of quality of life could be more affected by these pathologies [16].

A case-control study carried out in 2021 by López-López et al., on the impact of quality of life related to foot problems in a non-rural population, concludes that foot problems have a negative impact on foot health-related quality of life, where the domains of footwear, general foot health and physical activity seem to be the factors associated with the presence of alterations and deformities of the feet [17]. We hypothesized that the rural population had better foot health according to the associated quality of life.

The general objective of this research was to analyze foot health in people in a rural population with and without foot problems, and its relationship with quality of life.

2. Material and methods

2.1. Design and sample

A prospective case-control study, carried out in a podiatry clinic in a rural region in the south east of Spain between January 2022 and April 2022. A consecutive and non-random sampling method was employed to recruit the 152 study subjects, 76 subjects with podiatric pathologies and 76 without foot disabilities. The inclusion criteria were to be over 18 years old and residents of the rural environment area around the clinic center, who present or do not present podiatric pathologies.

Patients were excluded if they were not adults, residents in the urban environment, people with a lack of total autonomy in daily activities, namely, who need help to develop basic task, people with cognitive disorders, subjects who did not sign their consent to participate in the research, subjects who did not respond to affiliation questions or those who did not understand the rules of participation.

2.2. Proccedure

All the data recording was carried out by a single main researcher before the evaluation, through interviews in which data on sociodemographic variables (age and sex), anthropometric variables (height, weight and BMI), social health (civil status, educational level, professional activity and sports activity) and comorbidities (presence of pathologies, previous interventions on the foot, allergies, taking drugs, and foot pathologies). The researchers explained the study procedures in detail to the participants. The interviews comprised questions on general health status, sociodemographic characteristics (sex, age, body mass index, height and weight) and comorbidities [18].

Next, the research subjects completed a validated tool to measure quality of life, the Short Form-36 Health Questionnaire (SF-36) in the Spanish version, through interviews in a podiatry clinic.

The SF-36 Health Questionnaire has 36 items that offer a general perspective of the person's state of health. It covers 8 scales, which represent the health concepts most frequently used in the main health questionnaires, as well as the aspects most related to disease and treatment. The scores for each of the 8 domains of the questionnaire range between 0 and 100, with 100 being a result indicating optimal health and 0 indicating a very poor state of health [19].

The 36 items of the instrument cover the following scales: Physical function with 10 questions, Physical role with 4 questions, Body pain with 2 questions, General health with 5 questions, Vitality with 4 questions, Social function with 2 questions, Emotional role with 3 questions and Mental health with 5 questions [20].

2.3. Sample size estimation

Sample size calculation was performed through the difference between two independent groups using the G*Power 3.1.9.2 software; a two-tailed hypothesis, an effect size of 0.50, an α error probability of 0.05, with a β level of 20%, and the desired power analysis of 80% (1-β error probability) and an allocation ratio (N2/N1) of 1 were used for the sample size calculations. A total sample size of 128 participants was calculated with at least 64 participants per group. A sample was recruited using a consecutive and non-random sampling method. Subjects were enlisted from a podiatric center in the south east of Spain. Healthy controls were matched according to age and sex.

A total sample size of at least 138 participants (69 per group) was established with a confidence level of 95%, a power of 0.80, an odds ratio to detect of 2.0, and an expected proportion exposed of 67% and 50% in the controls. The total sample (152 participants) consisted of 76 cases (30 men and 46 women) and 76 controls (35 men and 41 women).

2.4. Ethical considerations

We obtained the approval of the Ethics Committee of the Rey Juan Carlos University of Madrid in Spain, with code number 1901202202322. Informed consent was obtained from each participant after an explanation of the purpose and process of the study and that the privacy of the participants' information would be ensured. The fact that their participation was completely voluntary was also highlighted. In addition, the guidelines associated with the ethical standards for research and experimentation on people were followed as reported in the Declaration of Helsinki [21], in its last modification, and the declarations of human rights and biomedicine of the Convention of the Council of Europe.

2.5. Statistical analysis

The SF-36 questionnaire Spanish version was administered to calculate the values of quality of life related to foot health. To calculate the statistical analysis of the scores of the domains of the questionnaire, a database was created in an Excel spreadsheet with the appropriate statistics (mean, standard deviation and number of cases) of each of the dimensions of the SF-36 and of each of the comparison samples, to which the algorithms of the *t*-test were applied [22].

To calculate quantitative data, the Kolmogorov-Smirnov test was used to assess normality, and data were determined to be normally distributed if $p < 0.05$. The only variable that presented a parametric distribution (the Kolmogorov-Smirnov test showed a p value of less than 0.05) was BMI, which is described as mean ± standard deviation (SD) and range (minimum-maximum). The contrasts between both groups were compared with Student's t-test for independent samples, to determine if statistically significant differences were obtained in all the variables between the two groups, that is, the cases and the controls. The other quantitative data presented a non-parametric distribution, including the results of the health domains evaluated by the SF-36 Health Questionnaire,

Regarding the categorical data, they were calculated by applying frequencies and percentages to distinguish these values, and the differences between both groups were contrasted with the Chi square test, to determine if there was a significant difference between the observed frequencies.

A value of $p < 0.05$ with a 95% confidence interval was considered

statistically significant for all tests.

All analyses were performed with SPSS 25.0v statistical software (IBM Corp., Armonk, NY, USA). Referring to an alpha error of 0.05 for a 95% confidence interval.

2.6. Results

A sample of 152 subjects completed the investigation and was divided into people with podiatric pathologies (for the case group, n = 76) and matched healthy participants (for the control group, n = 76) with an age range of 20–90 years. Statistically significant differences ($p < 0.05$) were found in BMI, which are shown in Table 1.

2.7. Outcome measurements

A sample of 152 subjects completed the investigation and was divided into people with podiatric pathologies (for the case group, n = 76) and matched healthy participants (for the control group, n = 76). Statistically significant differences ($p < 0.05$) were found for the level of studies and professional activity that are shown in Table 2.

Statistically significant differences ($p < 0.05$) were found for general pathology, high blood pressure, diabetes, and other cardiovascular diseases that appear in Table 3.

Statistically significant differences ($p < 0.05$) were found for foot interventions, surgery and insoles that appear in Table 4.

Statistically significant differences ($p < 0.05$) were found for antihypertensive and antidiabetic drugs, which appear in Table 5.

Regarding the 76 subjects with foot pathologies, 25 of them (32.9%) had bone pathology, 8 (10.5%) infections, 20 (26.3%) calluses, 13 (17.1%) nail pathology, 1 (1.3%) dermatological pathology of the foot, 2 (2.6%) diabetic foot, 1 (1.3%) amputations, 7 (9.2%) flat foot, 2 (2.6%) foot cavo, 3 (3.9%) neuropathic pathology, 8 (10.5%) plantar fasciitis 4 (5.3%), and gait disturbances 4 (5.2%).

The variables that did not show a normal distribution were BMI and the domains analyzed by the SF-36 questionnaire ($p < 0.05$), while age, weight, height and sex did show a normal distribution ($p > 0.05$).

Regarding the comparison of the scores obtained with the SF-36, the results appear in Table 6. These scores were higher for the control group, indicating better health scores in all variables, although this difference was only statistically significant ($p < 0.05$) for the variables physical function, physical role, body pain and general health.

Table 1
Sociodemographic characteristics of patients with podiatric pathologies and matched healthy controls.

Sociodemographic characteristics	Whole Group Mean ± SD Range (n = 152)	Cases Group Mean ± SD Range (n = 76)	Controls Group Mean ± SD Range (n = 76)	p-value
Age (years)	46.67 ± 13.69 (20–90)	49.18 ± 14.96 (26–90)	44.16 ± 11.79 (20–85)	0.080[a]
Height (m)	1.68 ± 0.103 (1.47–1.94)	1.68 ± 0.11 (1.47–1.94)	1.69 ± 0.1 (1.50–1.88)	0.629[a]
Weight (kg)	72.72 ± 13.25 (45–107)	74.47 ± 12.49 (50–107)	70.98 ± 13.84 (45–89)	0.092[a]
BMI (kg/m2)	25.63 ± 3.93 (18.59–37.78)	26.41 ± 3.75 (18.59–37.78)	24.86 ± 3.99(20–25)	**0.015** [b]
Sex (%)				
Male	65 (42.8%)	30 (39.5%)	35 (46.1%)	0.42 [c]
Female	87 (57.2%)	46 (60.5%)	41 (53.9%)	

Abbreviations: BMI, body mass index; SD, standard deviation. In all analyses, $p < 0.05$ (with a 95% confidence interval) was considered statistically significant. The mean ± interquartile range, the range (min-max).

[a] Mann-Whitney *U* test were applied.

[b] Student's t-test for independent samples.

[c] Pearson's Chi square test was used.

Table 2
Social characteristics of the sample, patients with podiatric pathologies and control group.

	Social Features	Whole Group n = 152	Cases Group n = 76	Controls Group n = 76	p-value
Marital status	**Married**	62 (40.8%)	32 (42.1%)	30 (39.5%)	0.096 [a]
	Single	45 (29.6%)	20 (26.3%)	25 (32.9%)	
	Couples	29 (19.1%)	12 (15.8%)	17 (22.4%)	
	Divorced	10 (6.6%)	6 (7.9%)	4 (5.3%)	
	Widowers	6 (3.9)	6 (7.9%)	0 (0.0%)	
Studies Level	**Incomplete Primary Ed.**	41 (27%)	26 (34.2%)	15 (19.7%)	0.048 [a]
	Complete Primary Ed.	4 (2.6%)	4 (5.3%)	0 (0.0%)	
	Secondary Ed.	43 (28.3%)	19 (25.0%)	24 (31.6%)	
	Degree	53 (34.9%)	22 (28.9%)	31 (40.8%)	
	Master	9 (5.9%)	5 (6.6%)	4 (5.3%)	
	Doctorate	2 (1.3%)	0 (0.0%)	2 (2.6%)	
Professional activity	**Self-employed**	23 (15.1%)	9 (11.8%)	14 (18.4%)	0.004 [a]
	Employees	87 (57.2%)	38 (50%)	49 (64.5%)	
	Unemployed	24 (15.8%)	13 (17.1%)	11 (14.5%)	
	Retirees	18 (11.8%)	16 (21.1%)	2 (2.6%)	
Sports activity	**Yes**	82 (53.9%)	36 (47.4%)	46 (60.5%)	0.104[a]
	No	70 (46.1%)	40 (52.6%)	30 (39.5%)	

Abbreviations: N, number.

[a] Pearson's Chi square test was used.

2.8. Discussion

The objective of the study was to analyze foot health in people with and without foot problems presenting in a rural population and its relationship with quality of life, with normalized reference scores, in light of the values recorded with respect to the state of foot health and general health.

The results of this research show that people with foot pathologies have a worse quality of life than those without foot pathology, in the rural population analyzed. The group of cases showed lower scores in quality of life, as did López-López et al. in another case-control study of quality of life related to foot health: Impact of quality of life related to foot problems: a case-control study [23].

The results obtained are consistent with other studies that point to the negative impact of quality of life and its relationship with the presence of foot pathology, as we concluded in our research [11,12,15,16,23–29].

Regarding the sociodemographic characteristics of the sample, we found statistically significant differences in age ($p < 0.05$), as did Matthew West et al. in a foot health study of Aboriginal and Torres Strait Islander peoples in regional and rural New South Wales, Australia. However, in this study they concluded that the quality of life related to specific foot health was on average generally good, with low rates of peripheral arterial disease and neuropathy. We agree on the low rate of neuropathy 8 (10.5%) [30].

In the case group of our research, the most frequent foot pathology was that of the bone pathology group, 25 subjects from the case sample (32.9%) with a mean age of 49.18 ± 14.96 (26–90). In a study by López López et al., on the impact of quality of life related to foot health in a sample of older people with hallux valgus, in which they used the Foot

Table 3
Comorbidities of the sample, patients with podiatric pathologies and control group.

Comorbidities		Whole Group n = 152	Cases Group n = 76	Controls Group n = 76	p-value
General pathology	**Yes**	63 (41.4%)	38 (60.3%)	25 (39.7%)	**0.032** [a]
	No	89 (58.6%)	38 (42.7%)	51 (57.3%)	
Arterial hypertension	**Yes**	19 (12.5%)	14 (73.7%)	5 (26.3%)	**0.027** [a]
	No	133 (87.5%)	32 (46.6%)	71 (53.4%)	
Diabetes	**Yes**	7 (4.6%)	7 (100%)	0 (0.0%)	**0.007** [a]
	No	145 (95.4%)	69 (45.4%)	76 (52.4%)	
Other cardiovascular diseases	**Yes**	14 (9.2%)	11 (78.6%)	3 (21.4%)	**0.025** [a]
	No	138 (90.8%)	65 (47.1%)	73 (52.9%)	
Dermatological Diseases	**Yes**	3 (2%)	2 (66.7%)	1 (33.3%)	0.560[a]
	No	149 (98%)	74 (49.7%)	75 (50.3%)	
Rheumatic diseases	**Yes**	14 (9.2%)	10 (71.4%)	4 (28.6%)	0.092[a]
	No	132 (90.8%)	66 (47.8%)	72 (52.2%)	
Oncological diseases	**Yes**	3 (2%)	2 (66.7%)	1 (33.3%)	0.560[a]
	No	149 (98%)	74 (49.7%)	75 (50.3%)	
Neurological diseases	**Yes**	4 (2.6%)	3 (75%)	1 (25%)	0.311[a]
	No	148 (97.4%)	73 (49.3%)	75 (50.7%)	
Smoking	**Yes**	5 (3.3%)	4 (80%)	1 (20%)	0.172[a]
	No	147 (96.7%)	72 (49%)	75 (51%)	
Digestive diseases	**Yes**	3 (2%)	2 (66.7%)	1 (33.3%)	0.560[a]
	No	149 (98%)	74 (49.7%)	75 (50.3%)	
Respiratory diseases	**Yes**	6 (3.9%)	4 (66.7%)	2 (33.3%)	0.405[a]
	No	146 (96.1%)	72 (49.3%)	74 (50.7%)	
Other general pathologies	**Yes**	20 (13.2%)	8 (40%)	12 (60%)	0.337[a]
	No	132 (86.8%)	68 (51.5%)	64 (48.5%)	

Abbreviations: N, number.
[a] Pearson's Chi square test was used.

Health Questionnaire, we did not coincide on the average age of the sample (20–90) compared to (65–96 years), but we did show similar results for the sociodemographic characteristic of weight 72.72 ± 13.25 (45–107) vs. 71.38 ± 12.1 (48–105). The study concludes that older people present foot problems that have a negative impact on quality of life related to foot health. We can say that in our study, bone disease is associated with a worse quality of life compared to people who do not have it [10].

In another case-control study of the impact of chronic plantar heel pain on health-related quality of life, Irving et al. coincide with our research in that the case group showed a worse quality of life than the control group. It also demonstrated statistically significant differences for general health and physical function, consistent with our results [11].

In our research, it stands out that in all categories of general disease, the proportion of these patients who presented foot pathology was at least twice as high, highlighting diabetics in that 100% of them reported foot pathology and had a lower quality of life than the control group. Another study by Hog et al. reflects that people with diabetes have a lower quality of life compared to the general population [14].

Table 5
Allergies and pharmacology of the sample, patients with podiatric pathologies and control group.

Drugs		Whole Group n = 152	Cases Group n = 76	Controls Group n = 76	p-value
Allergies	**Yes**	39 (25.7%)	19 (48.7%)	20 (51.3%)	0.853[a]
	No	113 (74.3%)	57 (50.4%)	56 (49.6%)	
Drugs	**Yes**	60 (39.5%)	35 (58.3%)	25 (41.7%)	0.097[a]
	No	92 (60.5%)	41 (44.6%)	51 (55.4%)	
Antihypertensives	**Yes**	20 (13.2%)	15 (75%)	5 (25%)	**0.016** [a]
	No	132 (86.8%)	61 (46.2%)	71 (53.8%)	
Antidiabetics	**Yes**	7 (4.6%)	7 (100%)	0 (0.0%)	**0.007** [a]
	No	145 (95.4%)	69 (47.6%)	76 (52.4%)	
Other cardiovascular drugs	**Yes**	10 (6.6%)	8 (80%)	2 (20%)	0.050[a]
	No	142 (93%)	68 (47.9%)	74 (92.1%)	
Diuretics	**Yes**	3 (2%)	3 (100%)	0 (0.0%)	0.080[a]
	No	149 (98%)	73 (49%)	76 (51%)	
Hormonal	**Yes**	9 (5.9%)	2 (22.2%)	7 (77.8%)	0.086[a]
	No	143 (94.1%)	74 (51.7%)	69 (48.3%)	
Chemotherapy	**Yes**	2 (1.3%)	1 (50%)	1 (50%)	1.000[a]
	No	150 (98.7%)	1 (50%)	1 (50%)	
Anticoagulants	**Yes**	1 (0.7%)	0 (0.0%)	1 (100%)	0.316[a]
	No	151 (99.3%)	76 (50.3%)	75 (49.7%)	
Antiaggregants	**Yes**	5 (3.3%)	2 (40%)	3 (60%)	0.649[a]
	No	147 (96.7%)	74 (50.3%)	73 (49.7%)	
Analgesics	**Yes**	9 (5.9%)	7 (77.8%)	2 (22.2%)	0.086[a]
	No	143 (94.1%)	69 (48.3%)	74 (51.7%)	
Other drugs	**Yes**	30 (19.7%)	19 (63.3%)	11 (36.7%)	0.103[a]
	No	122 (80.3%)	57 (46.7%)	65 (53.3%)	

Abbreviations: N, number.
[a] Pearson's Chi square test was used.

Table 4
Interventions in the foot of the sample, patients with podiatric pathologies and control group.

Foot interventions		Whole Group n = 152	Cases Group n = 76	Controls Group n = 76	p-value
Foot interventions	**Yes**	18 (11.8%)	16 (88.9%)	2 (11.11%)	**<0.001** [a]
	No	134 (88.2%)	60 (44.8%)	74 (55.2%)	
Surgeries	**Yes**	13 (8.6%)	11 (84.6%)	2 (15.4%)	**0.009** [a]
	No	139 (91.4%)	65 (46.8%)	74 (53.2%)	
Infiltrations	**Yes**	1 (0.7%)	1 (100%)	0 (0.0%)	0.316[a]
	No	151 (99.3%)	75 (49.7%)	76 (53.3%)	
Orthotics	**Yes**	4 (2.6%)	4 (100%)	0 (0.0%)	**0.043** [a]
	No	148 (97.4%)	72 (48.6%)	76 (51.4%)	

Abbreviations: N, number.
[a] Pearson's Chi square test was used.

Table 6
Characteristics of Quality of Life in people with and without foot problems.

SF-36 Domains	Whole Group Mean ± SD Range (n = 152)	Cases Group Mean ± SD Range (n = 76)	Controls Group Mean ± SD Range (n = 76)	p-value
Physical function	86.25 ± 21.18 (0–100)	79.86 ± 26.38 (0–100)	92.63 ± 11.17 (60–100)	**<0.001***
Physical role	81.08 ± 35.58 (0–100)	73.68 ± 41.00 (0–100)	88.48 ± 27.51 (0–100)	0.022*
Body pain	52.21 ± 30.70 (0–100)	45.81 ± 27.18 (0–100)	58.60 ± 32.81 (12–100)	0.035*
General health	64.53 ± 19.96 (0–100)	60.36 ± 30.58 (0–97)	68.71 ± 18.52 (30–100)	0.047*
Vitality	62.66 ± 19.92 (10–100)	61.05 ± 19.31 (15–100)	64.27 ± 20.52 (10–100)	0.262*
Social function	78.86 ± 22.89 (0–100)	75.98 ± 23.78 (12.5–100)	81.74 ± 21.74 (0–100)	0.115*
Emotional role	80.48 ± 36.48 (0–100)	78.07 ± 38.31 (0–100)	82.89 ± 34.63 (0–100)	0.433*
Mental health	69.57 ± 18.98 (24–100)	67.63 ± 18.85 (24–100)	71.52 ± 10.03 (32–100)	0.192*

Abbreviations: SF-36 = Quality of Life Questionnaire; SD, standard deviation. The mean ± interquartile range, (min-max) and the Mann-Whitney *U* test * were used. In all analyses, $p < 0.05$ (with a 95% confidenc confidence interval) was considered statistically significant.

In another case-control study titled Foot Health-Related Quality of Life Among Older People with and without Minor Toe Deformities, comparing the impact of foot health-related quality of life on foot health and health in general, López López et al. showed a normal distribution ($p > 0.05$) for the sociodemographic characteristics of the sample, in our research, these characteristics showed a distribution that was not normal ($p < 0.05$), except for BMI, which did show a normal distribution. Regarding the variables of the questionnaire, we agree that there was no normal distribution for physical function and general health. There were no significant differences in both groups regarding the variables age, height and weight [16].

The alteration of quality-of-life factors related to foot health, especially in the population with podiatric pathologies, requires adequate measurement mechanisms. The SF-36 Health Questionnaire was used as a valid tool to assess the health level of the population. A sample of 152 individuals from a rural population in south eastern Spain were interviewed, divided into 2 groups of equal size, one of them with foot pathology and the other without foot pathology. In another study carried out by Palomo López et al. titled: Simultaneous Validity of Foot Health Status Questionnaire and Study Short Form 36 for Measuring Health-Related Quality of Life in Patients with Foot Problems, they used the SF-36 Health Questionnaire as a reliable and validated tool in Spanish that can provide a measurement of health-related quality of life for specific foot conditions and general condition, to correlate the domains of the Questionnaire on the health status of feet and the SF-36 Health Questionnaire in patients with foot problems. Regarding the sociodemographic characteristics of the sample, all the data were not normally distributed, except for weight and BMI, we coincide in that the BMI had a normal distribution. We have similar results in age (20–90) compared to (21–80). Regarding the social characteristics of the sample, we agree that no statistically significant differences were found for marital status; on the contrary, we present discrepant results for professional activity and educational level. The foot pathologies found are consistent with all, except: infections, diabetic foot, amputations and gait disturbances [24].

Nicolò Martinelli et al. in their case-control study in which they measure the quality of life in young adults after flat feet surgery, found lower quality of life levels for most of the parameters of the SF-36 Health Questionnaire for the cases group compared to the control group, except in the subscales related to physical function, social function and emotional role. In our study, all the scales of the questionnaire had a lower score in the case group. They found significant correlations for the physical role, body pain, general health, vitality, and mental health domains ($p < 0.05$), coinciding with our research in the physical role, body pain, and general health domains [31].

In another nationwide case-control study discussing dependency, life satisfaction, general mental and physical status of victims of the Iran-Iraq war, to study the health status of patients with ankle-foot osteomyelitis and provide information on better management of this disease and suggest appropriate measures to improve the quality of life of affected patients, Maryam Hosseini et al. used the SF-36 Health Questionnaire as a tool to measure quality of life. The entire population of the case group had a lower quality of life in the eight dimensions of health compared to the control group; these data coincide with those of our study [32].

In our research, a significant association was found between the two groups with respect to BMI ($P < 0.015$), as was the case with Roy Gigi et al. in a case-control study on deviations in gait metrics in patients with chronic ankle instability, in which significant differences were found in BMI between the two groups ($p < 0.035$). Our scores on the health domains of the SF-36 Health Questionnaire are also similar to those of this study, since all the domains of the questionnaire had a lower score in the case group than in the control group, as well as pain. Body pain and physical functioning subscales were statistically significant [33]. These results are also consistent with those obtained by Mazlina et al. in a study on health-related quality of life in patients with foot problems in Malaysia, where SF-36 scores were lower in patients with foot problems [32]. Like Mickle et al. in a cross-sectional analysis of foot function, functional capacity, and health-related quality of life in older people with disabling foot pain, the group of participants presenting with foot pain scored significantly lower on the SF-36 total and all subcomponents [12].

In this investigation, the most frequent podiatric pathology was bone with 32.9%. Menz HB et al. in their study on the impact of hallux valgus severity on quality of life in general and specific to the foot, show in their results that this pathology was present in 36.3% of the study population and they obtained lower scores in all domains of the SF-36 Health Questionnaire, being significant for the domains physical function, body pain, general health, social function and mental health. These results are similar to those of our research; however, we did not show significant values for the social function and mental health domains.

Bergin et al. in another study on the impact of the first metatarsophalangeal joint osteoarthritis on health-related quality of life, show that the physical function domain of the SF-36 Questionnaire was significant. In our results, this domain was also significant [34].

Finally, regarding special populations with foot disabilities and poor health related problems, our achievements go in the same direction as prior research as regards foot health status in the case of diabetic populations [35] or subjects with Parkinson's disease [36].

This study has several limitations. The first is that all the patients in the sample were collected from the same podiatry practice. The control group, although they did not present pathologies in the foot, had also consulted in the same clinic in the form of companions, so they may have a biased perception of the disease and therefore of their quality of life. On the other hand, the research was carried out by a single researcher in a podiatry clinic for the population of a small town in the Autonomous Region of Murcia. It may not be representative which limits its external validity. More robust studies would require a larger sample, collected from several centers with participants from different municipalities, regions or countries that could be matched according to sociodemographic characteristics of sex, age or BMI.

Future studies should include more participating clinics, a larger subject sample, and participants from different municipalities in order to improve the external validity of the study.

2.9. Conclusions

In rural population, people with foot pathologies present a worse quality of life compared to the population that does not present foot pathology, these differences are significant for the health domains of the SF-36 Questionnaire: physical function, physical role, body pain and general health.

Declaration of competing interest

Maria Victoria Andreo-García, Emmanuel Navarro-Flores, Marta Elena Losa-Iglesias, Ricardo Becerro de Bengoa Vallejo, Juan Gómez Salgado, Daniel López-López, declare that they have no conflict of interest.

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