

## ORIGINAL ARTICLE

# Individual and Institutional Factors Associated With the Quality of Life of Portuguese Older Adults Living in Nursing Homes

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## ABSTRACT

**Purpose:** To identify individual and institutional characteristics that are associated with the quality of life (QoL) of institutionalized older adults aged 60 and above in Portuguese nursing homes.

**Methods:** This cross-sectional study involved 22 nursing homes from the central region of Portugal and a total of 213 institutionalized older adults aged 60 or older without cognitive impairment, selected through random cluster sampling. Participants were interviewed using a structured questionnaire to collect data on sociodemographic, lifestyle behaviours, and information related to their nursing home experience. Institutional characteristics were reported by the Technical Director of each nursing home. Multiple linear regression models were conducted to identify individual and institutional characteristics associated with QoL, controlling for potential confounders. QoL was assessed using the Portuguese version of the WHOQOL-OLD scale.

**Results:** The mean age of participants was 84.8 years, with 67.1% being female. The average WHOQOL-OLD total score was 63.3 on a 0–100 scale. Higher levels of loneliness were associated with a decrease in the QoL score ( $\beta = -0.790$ ; 95% confidence intervals [CI]:  $-0.981$ ;  $-0.599$ ). Collaborating in the institution chores ( $\beta = 7.669$ ; 95% CI: 3.220; 12.118), monthly visits ( $\beta = 7.099$ ; 95% CI: 2.450; 11.748), and the existence of outdoor spaces ( $\beta = 6.519$ ; 95% CI: 2.459; 10.579) were positively associated with participants' QoL.

**Conclusion:** QoL in nursing homes is shaped by both individual and institutional factors. Loneliness, participation in chores, family visits, and access to outdoor spaces significantly impact well-being, emphasizing the need for targeted interventions and policies to enhance the lives of institutionalized older adults.

## 1 | Background

In the last few decades, improvements in health and survival, as well as a decrease in birth rates, have driven a gradual and irreversible shift toward demographic ageing, bringing major challenges to health and social systems [1]. In response, the United Nations declared 2021–2030 as the Decade of Healthy Ageing,

aiming to enhance the health and well-being of older adults [2], including access to good-quality long-term care for older adults who need it. Similarly, in recent years the European Union (EU) has increasingly emphasized the relevance of high-quality long-term care, particularly through home care and community-based services, as outlined in the European Care Strategy [3]. The EU notes that, despite being regulated, residential care institutions

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often fall short in addressing the residents' quality of life (QoL) and their capability to maintain independence [4]. This issue is particularly relevant for Portugal, which is becoming the fastest ageing country in Europe [5] and where the number of nursing homes increased by 178% between 2000 and 2021 [6].

Increased life expectancy does not necessarily translate into healthier lives, and pursuing an active and healthy ageing for all, which goes beyond being free from disease, is imperative [7–9]. In fact, it is also crucial to focus on enhancing QoL [1, 9], which depends on the combination of social, physical, functional, and psychological factors. Particularly in older adults, QoL is often affected by the loss of family members, physical limitations and reduced social contacts, leading to a decrease in QoL as they age [10–12]. Specifically in institutionalized older adults, besides the care provided by nursing homes, QoL also depends on the social interaction with their visits, friends or family members; these help to prevent feelings of loneliness or social isolation that many experience due to a lack of meaningful relationships in their living environment [10, 13]. Despite the recognized importance of QoL for older adults living in nursing homes, the literature on this subject remains relatively limited. Most studies to date have predominantly focused on resident characteristics as predictors of QoL, analysing factors such as sociodemographics [14, 15], functional levels [16–18], cognitive impairment [14, 15, 17], pain [14], depression [17], loneliness [19], frailty, and sleep quality [20]. Other factors, such as the availability of social and family support [21, 22], frequency of visits [22], length of stay [15, 22] and reasons for admission [13, 21], have also been linked with QoL in these settings [13, 15, 21]. However, other institutional factors that can provide a more complete characterization of the QoL of this population remain understudied and with inconsistent findings, including physical characteristics such as ownership, location and facility size, and the availability of specialized professionals and activity/recreation staff [15, 23]. Access to outdoor spaces, although recognized as relevant to the wellbeing [24], remains largely unexplored as a predictor of QoL in this context.

Altogether, these facts highlight the need for a comprehensive and multi-layered understanding of the QoL and its interrelated factors among nursing home residents. This knowledge will provide crucial information to plan and design specific interventions in these settings, with clear benefits for institutionalized individuals, their families, and healthcare professionals. As such, the aim of the present study is to identify individual and institutional characteristics that are associated with the QoL of institutionalized older adults with at least 60 years of age in Portuguese nursing homes.

## 2 | Methods

### 2.1 | Study Design and Participants

This is a cross-sectional study, considering the target population of individuals aged 60 or older, institutionalized in nursing homes from public, private, or social solidarity sectors in five municipalities (Batalha, Leiria, Marinha Grande, Pombal and Porto de Mós, covering a total of 263 500 inhabitants) from the central region of mainland Portugal [25].

The sample was obtained through random cluster sampling, with each nursing home being the primary sampling unit. Thus, the sample size was calculated considering a significance level of  $p \leq 0.05$ , a 95% confidence interval (CI) and a power of 80%, adjusted for the estimated proportions of refusals (20%) and of participants who meet the exclusion criteria (30%) [6, 26].

The total number of clusters was calculated considering an average cluster size of 33, based on the mean number of residents per institution in the study population [6], and an intraclass correlation coefficient of 0.01 based on existing literature on the topic [26, 27]. Thus, data collection was required from 22 nursing homes (13 private and 9 from social solidarity sectors), selected from a total of 90 institutions, in accordance with the calculation outlined below.

$$\begin{aligned} \text{Nº de clusters} &= \frac{n}{n'} [1 + (n' - 1) * ICC] \\ &= \frac{532}{33} [1 + (33 - 1) * 0,01] = 21,28 \rightarrow 22 \end{aligned}$$

$n$ : Sample size (corrected for projected refusal and exclusion rates);  $n'$ : average cluster size; ICC: intraclass correlation coefficient.

For the purposes of the present study, individuals institutionalized aged 60 or older and without cognitive impairment were included. Cognitive impairment was assessed using the Portuguese version of the Mini-Mental State Examination (MMSE), applying the education-adjusted cut-off values [28]:  $\leq 15$  for illiterate individuals,  $\leq 22$  for individuals with 1–11 years of education, and  $\leq 27$  for those with 12 or more years of education. From the 22 nursing homes randomly selected for this study, in which a total of 749 individuals lived, 11 participants refused to participate, and 525 did not meet the age ( $n = 4$ ) and cognitive impairment ( $n = 521$ ) inclusion criteria, resulting in a final sample of 213 participants. Participants who did not meet the MMSE eligibility criteria were not enrolled in the study; therefore, no further information was collected or retained for these individuals.

The study was carried out from March to April 2022. Written informed consent was obtained from all the participants.

### 2.2 | Data Collection and Measures

For analytical purposes, the collected data were organized into two analytical levels: (i) individual-level variables (individual characteristics) and (ii) institutional-level variables (institutional characteristics), as detailed in Table 1.

- i. Individual-level variables (individual characteristics) were collected using a structured questionnaire applied by trained interviewers and comprised sociodemographic data (age, sex, years of education, marital status) and lifestyle information, such as daily pre-institutionalization tobacco use (defined as smoking at least one cigarette per day) and daily alcohol consumption (defined as consuming at least one alcoholic beverage per day). Loneliness was also assessed as an independent variable using the Portuguese version of the University of California, Los Angeles (UCLA) Loneliness Scale [29], consisting of 16

**TABLE 1** | Individual-level variables and institutional-level variables considered in this study.

| Variable level                | Variable                                              |
|-------------------------------|-------------------------------------------------------|
| Individual-level variables    | Sex                                                   |
|                               | Age                                                   |
|                               | Education                                             |
|                               | Marital status                                        |
|                               | Tobacco use                                           |
|                               | Alcohol consumption                                   |
|                               | UCLA-Loneliness Scale                                 |
|                               | Duration of institutionalization                      |
|                               | Visit frequency                                       |
|                               | Participation in sports activities                    |
|                               | Participation in cultural activities                  |
|                               | Daily television viewing time                         |
|                               | Collaboration in the institution chores               |
|                               | Room typology                                         |
|                               | Existence of another family member in the institution |
| Institutional-level variables | Type of institution                                   |
|                               | Total number of users                                 |
|                               | Full-time socio-cultural animator                     |
|                               | Physiotherapy services                                |
|                               | Availability of a facility physician                  |
|                               | Location classification                               |
|                               | Outdoor space                                         |
|                               | Access to sports activities                           |
|                               | Access to cultural activities                         |

items and presenting two dimensions (social isolation and affinity). The total score ranges from 16 to 64, with higher scores indicating greater levels of loneliness. The nursing home experience reported by the participants included participation in sports and cultural activities, visit frequency, room typology, duration of institutionalization, daily television viewing time, existence of another family member in the institution, and collaboration on the institution chores according to their preference (involvement in daily activities, such as cleaning or assisting in meal preparation).

QoL was assessed using the Portuguese version of the “World Health Organization Quality of Life—Old” scale (WHOQOL-OLD) [30], which is an inventory for assessing QoL specifically designed for older adults. This tool consists of 28 items with a Likert-type response scale of five points (1–5), covering seven facets (each with four

items): Sensory Functioning; Autonomy; Past, Present, and Future Activities; Social Participation; Death and Dying; Intimacy; and Family/Family Life. Higher scores indicate a better QoL. Raw scores were transferred into a transformed scale score between 0 and 100. Items 1, 2, 3, 7, 8, 9, and 10 are negatively worded, and therefore, they were recoded/reversed, as defined by the scale’s authors.

- ii. Institutional-level variables (institutional characteristics) were selected based on the literature review, while also considering Portuguese legislation and the specific context of these institutions, including their structure, organization, and geographical location. A detailed assessment of institutional-level variables was conducted through a structured questionnaire applied to the Technical Director of each nursing home. The classification of nursing home locations as rural or non-rural was based on the criteria from the Portuguese Rural Development Programme [31].

### 2.3 | Statistical Analysis

Continuous variables are expressed as means and standard deviations (SD) or as medians and interquartile ranges (IQR), as applicable. Categorical variables were described as counts and proportions.

The association between the independent variables and QoL scores was initially examined using simple linear regression analyses. Subsequently, multiple linear regression analysis was performed to develop a parsimonious model for predicting QoL scores based on the independent variables analysed. Model assumptions were assessed, including normality, homogeneity, and independence of residuals, as well as multicollinearity diagnostics and the presence of influential outliers. No relevant violations were identified in the models presented. All variables showing statistical significance in the bivariate analyses were included in the multivariate model, while age and sex were retained regardless of statistical significance [32].

The overall significance of the model was evaluated using the *F*-test (ANOVA). The model’s quality was assessed through the adjusted coefficient of determination, which allowed for evaluating the proportion of the dependent variable’s variation explained by the independent variables in the model.

All statistical analyses were conducted using SPSS version 25.0 (IBM Corp., Armonk, NY), with a significance level set at  $p < 0.05$  for all tests.

The authors declare that no artificial intelligence (AI) or large language model (LLM) tools (such as ChatGPT or similar) were used in the development, writing, or editing of this manuscript.

## 3 | Results

Table 2 shows individual characteristics reported by the study participants. The mean age of the study sample was 84.8 years (SD = 8.2), and 67.1% were female. More than half had less than 4 years of education, two-thirds were widowed (68.7%), and the

**TABLE 2** | Individual-level variables—characteristics of participants and nursing homes ( $n = 213$ ).

| Individual characteristics reported by the participants from the nursing homes |                    | $N = 213$<br>$n$ (%) <sup>a</sup> |
|--------------------------------------------------------------------------------|--------------------|-----------------------------------|
| Participant-related characteristics                                            |                    |                                   |
| Sex                                                                            | Female             | 143 (67.1)                        |
| Age (years)                                                                    | Mean (SD)          | 84.8 (8.2)                        |
|                                                                                | Range              | 61–102                            |
| Education (years)                                                              | 0                  | 67 (31.5)                         |
|                                                                                | 1–3                | 56 (26.3)                         |
|                                                                                | 4                  | 55 (25.8)                         |
|                                                                                | ≥ 5                | 35 (16.4)                         |
| Marital status                                                                 | Single             | 25 (11.8)                         |
|                                                                                | Married            | 32 (15.2)                         |
|                                                                                | Divorced           | 9 (4.3)                           |
|                                                                                | Widowed            | 145 (68.7)                        |
| Tobacco use (prior to institutionalization)                                    | No                 | 198 (93.0)                        |
| Alcohol consumption (prior to institutionalization)                            | No                 | 135 (63.4)                        |
| UCLA-Loneliness Scale                                                          | Mean (SD)          | 28.3 (10.4)                       |
|                                                                                | Range              | 16–64                             |
| Nursing home-experience                                                        |                    |                                   |
| Duration of institutionalization (years)                                       | Mean (SD)          | 3.3 (4.3)                         |
|                                                                                | Range              | 0.1–38                            |
| Visit frequency                                                                | Daily              | 7 (3.3)                           |
|                                                                                | At least weekly    | 92 (43.3)                         |
|                                                                                | At least monthly   | 67 (31.6)                         |
|                                                                                | < 1 per month      | 46 (21.7)                         |
| Participation in sports activities <sup>b</sup>                                | No                 | 135 (64.0)                        |
| Participation in cultural activities <sup>b</sup>                              | No                 | 196 (92.5)                        |
| Daily television viewing time (hours)                                          | Mean (SD)          | 2.8 (2.3)                         |
|                                                                                | Range              | 0–12                              |
| Collaboration in the institution chores <sup>c</sup>                           | No                 | 160 (75.8)                        |
| Room typology                                                                  | Single             | 51 (24.1)                         |
|                                                                                | Double             | 141 (66.5)                        |
|                                                                                | Triple (or higher) | 20 (9.4)                          |

(Continues)

**TABLE 2** | (Continued)

| Individual characteristics reported by the participants from the nursing homes |    | $N = 213$<br>$n$ (%) <sup>a</sup> |
|--------------------------------------------------------------------------------|----|-----------------------------------|
| Existence of another family member in the institution (user or collaborator)   | No | 163 (76.5)                        |

Abbreviations: SD, Standard deviation; UCLA, University of California Los Angeles.

<sup>a</sup>Except if otherwise specified.<sup>b</sup>Whether promoted by the institution they are in, by other entities, or by their own initiative.<sup>c</sup>Whether the participant had the opportunity to collaborate in nursing home chores, such as cleaning and meal preparation.

majority had no previous history of tobacco or alcohol consumption (93.0% and 63.4%, respectively). The average loneliness score on the UCLA-Loneliness scale was 28.3 points (SD = 10.4).

Regarding their individual nursing experience, participants remained institutionalized for an average of 3.3 years (SD = 4.3). Most participants reported no regular participation (at least once a month) in sports (64.0%) and cultural activities (92.5%) after being institutionalized, whether promoted by the institution they are in, by other entities or by their own initiative. Daily television viewing time was, on average, 2.8 h (SD = 2.3), and two-thirds had a double room typology (66.5%). The great majority did not have another family member as a user or collaborator in the same institution (76.5%) and did not participate in the institution chores (75.8%). Approximately 46.6% reported at least a visit once a week (Table 2).

Regarding the institutional characteristics reported by Nursing Home Technical Directors (Table 3), more than half of the participants lived in private nursing homes (59.1%) and there were no public nursing homes available in the geographical area of the study. A median of 38 users per institution was observed (IQR = 30), with a minimum of 17 and a maximum of 63 users. Directors reported that 45.5% had access to a full-time socio-cultural animator, 59.1% to physiotherapy services and all users had an institutional doctor. The majority of the nursing homes were classified as non-rural locations (77.3%); more than two thirds had an outdoor space (68.2%), and more than half of them presented regular availability of sports and cultural activities (77.3% and 59.1%, respectively).

Regarding QoL, Figure 1 presents the mean and SD of the WHOQOL-OLD total score and its seven facets. The mean WHOQOL-OLD total score was 63.3 (SD = 14.5), indicating a moderate-to-high overall perception of QoL among participants. However, 13.7% ( $n = 29$ ) of participants presented a total score below 50, suggesting poorer perceived QoL in this subgroup. When examining the specific WHOQOL-OLD facets, differences were observed across the assessed dimensions. The highest mean score was observed for the Family/Family Life facet (mean = 73.6; SD = 26.3), followed by Sensory Functioning (mean = 66.3; SD = 27.5) and Death and Dying (mean = 65.5; SD = 28.7). In contrast, the lowest mean scores were observed for

Autonomy (mean=58.7; SD=21.5), Past, Present, and Future Activities (mean=60.8; SD=18.9), and Intimacy (mean=61.0; SD=27.5). Social Participation presented a mean score of 61.7 (SD=22.1). Overall, these findings suggest that participants reported more positive perceptions regarding family relationships and family life, whereas domains related to autonomy and personal activities were comparatively less favourable (Figure 1).

The analysis of the correlational structure between UCLA Loneliness Scale scores and the different WHOQOL-OLD facets, performed using scatter plots and Pearson correlation

coefficients, showed statistically significant negative correlations across all assessed dimensions. Higher levels of loneliness were consistently associated with lower QoL scores in all WHOQOL-OLD facets. The strongest correlation was observed for Past, Present, and Future Activities ( $r=-0.527$ ;  $p<0.001$ ), followed by Family/Family Life ( $r=-0.445$ ;  $p<0.001$ ) and Autonomy ( $r=-0.371$ ;  $p<0.001$ ). Moderate negative correlations were also observed for Social Participation ( $r=-0.361$ ;  $p<0.001$ ) and Sensory Functioning ( $r=-0.319$ ;  $p<0.001$ ). The weakest, although still statistically significant, associations were observed for Death and Dying ( $r=-0.242$ ;  $p<0.001$ ) and Intimacy ( $r=-0.260$ ;  $p<0.001$ ). Overall, these findings indicate that greater loneliness is associated with poorer perceived QoL across all WHOQOL-OLD dimensions (Table 4).

For the association between individual and institutional characteristics with QoL, the multiple linear regression analysis revealed a statistically significant model ( $F_{(6,146)}=23.578$ ,  $p<0.001$ ,  $R^2=0.471$ ). After an initial assessment of the association between these characteristics and the QoL, where crude models were computed for each variable individually, the final multivariate model included age, sex, loneliness, collaborating in the institution chores, having at least a monthly visit, and the existence of outdoor spaces as associated factors explaining approximately 47% of the variance in QoL among institutionalized older adults. Additionally, higher levels of loneliness were associated with a decrease in the QoL score ( $\beta=-0.790$ ; 95% CI:  $-0.981$ ;  $-0.599$ ) (Table 5). Collaborating in the institution chores ( $\beta=7.669$ ; 95% CI: 3.220; 12.118), monthly visits ( $\beta=7.099$ ; 95% CI: 2.450; 11.748) and the existence of outdoor spaces ( $\beta=6.519$ ; 95% CI: 2.459; 10.579) were positively associated with participants' QoL.

## 4 | Discussion

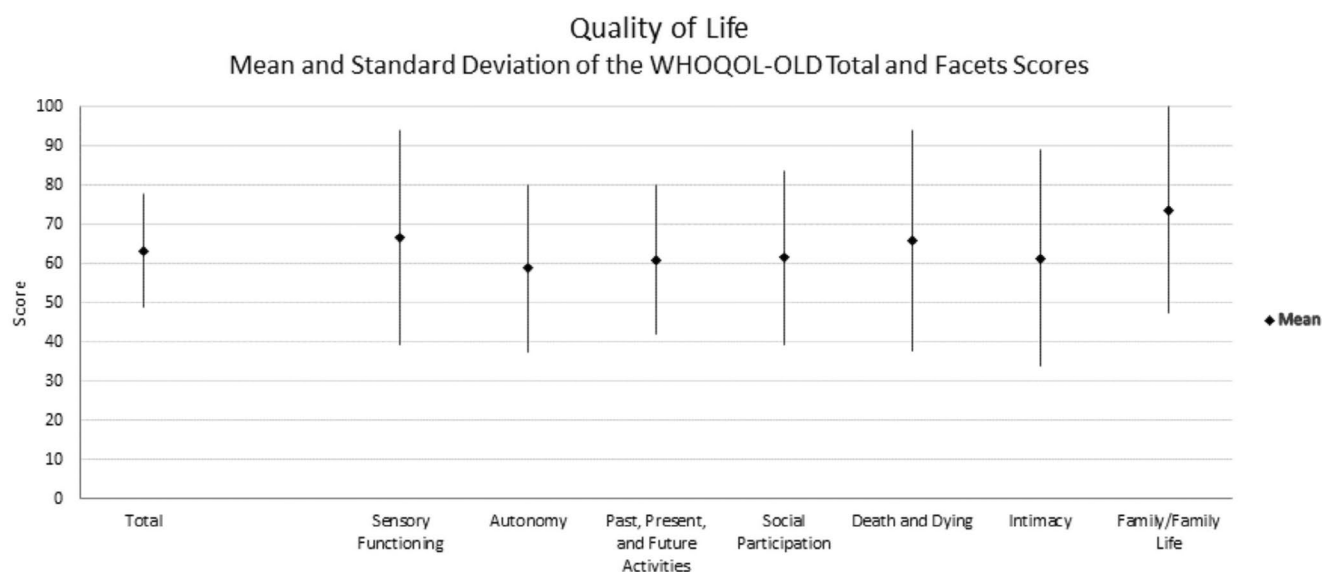
The present study identified individual and institutional characteristics that are associated with the QoL of institutionalized

**TABLE 3** | Institutional-level variables—descriptive analysis of the institutional characteristics.

| Institutional characteristics reported by Nursing Home Technical Directors |              | N = 22 n (%) <sup>a</sup> |
|----------------------------------------------------------------------------|--------------|---------------------------|
| Type of institution                                                        | Private      | 13 (59.1%)                |
|                                                                            | PSSI         | 9 (40.9%)                 |
| Total number of users                                                      | Median (IQR) | 38 (30)                   |
| Full-time socio-cultural animator                                          | Yes          | 10 (45.5%)                |
| Physiotherapy services                                                     | Yes          | 13 (59.1%)                |
| Availability of a facility physician                                       | Yes          | 22 (100.0%)               |
| Location classification                                                    | Non-rural    | 17 (77.3%)                |
| Outdoor space                                                              | Yes          | 15 (68.2%)                |
| Access to sports activities                                                | Yes          | 17 (77.3%)                |
| Access to cultural activities                                              | Yes          | 13 (59.1%)                |

Abbreviations: IQR, interquartile range; PSSI, Private Social Solidarity Institution.

<sup>a</sup>Except if otherwise specified.



**FIGURE 1** | Mean and standard deviations of the WHOQOL-OLD total and facets scores. WHOQOL-OLD, World Health Organization Quality of Life Assessment for Older Adults.

**TABLE 4** | Correlation between the UCLA Loneliness Scale and the WHOQOL-OLD facets.

| WHOQOL-OLD facet                    | <i>r</i> | Interpretation of correlation         |
|-------------------------------------|----------|---------------------------------------|
| Past, present and future activities | −0.527*  | Moderate negative correlation         |
| Family/family life                  | −0.445*  | Moderate negative correlation         |
| Autonomy                            | −0.371*  | Weak-to-moderate negative correlation |
| Social participation                | −0.361*  | Weak-to-moderate negative correlation |
| Sensory functioning                 | −0.319*  | Weak negative correlation             |
| Intimacy                            | −0.260*  | Weak negative correlation             |

Note: Higher UCLA Loneliness Scale scores indicate higher levels of loneliness. Higher WHOQOL-OLD facet scores indicate better quality of life. Pearson correlation coefficients were calculated to assess the association between loneliness and quality of life dimensions. *r*—Pearson correlation coefficient; \**p* < 0.001.

older adults in Portugal. Among individual factors, collaborating in the institution's chores and receiving at least a monthly visit were positively associated with the QoL of older adults, while loneliness demonstrated a negative association. Regarding institutional factors, outlined by the Technical Directors of the nursing homes, having outdoor spaces was related to a higher QoL of this population.

The average QoL total score in this study was 63, slightly higher than the 59 reported in a national study [30] with a similar population but drawn from across the entire country. However, when restricting the analysis to older adults in the community, our sample presents slightly lower levels of QoL, since this community sample had a mean score of 68 [30]. This difference aligns with previous research, which suggests that entering a nursing home can negatively impact QoL [33], and Portugal is no exception [34], although evidence remains limited. One review also supports this negative effect of institutionalization on QoL of older adults, but there was a note of caution in interpreting the findings due to the low quality of evidence [35].

Much of the current literature focuses on the QoL of older adults living in the community, while the factors influencing QoL of older adults in nursing homes are less clear, particularly regarding the variables under study, making cross-study comparisons difficult. The few studies conducted in this area have shown that lower functionality level [16–18], pain [14], cognitive impairment [14, 15, 17], depression [17], frailty, and lower sleep quality [20] are associated with decreased QoL among institutionalized older adults. Additionally, one study found a positive relationship between older adults' attitudes toward ageing and their QoL [36].

Our study corroborates prior research in Portugal that highlights the positive relationship of family and friends visit frequency on the QoL of older adults in nursing homes [37]. Additionally, we

found no significant association between age and QoL. Evidence regarding the influence of age on QoL research still provides mixed results. For instance, a study analysing older adults in nursing homes in Germany and Poland found a positive correlation between age and QoL [18]. However, when results were disaggregated by country, age did not show a significant impact on the QoL of German older adults [18]. Other studies have also suggested that age may not influence QoL [13, 38].

Contrary to our findings, one study in a Portuguese city found that room type showed a significant relationship with the overall QoL of older adults, with residents in private rooms reporting slightly higher QoL levels compared to those sharing double rooms, being more pronounced when contrasted to older adults sharing triple rooms [13].

Loneliness emerged in this study as an individual factor decreasing the QoL of older adults living in nursing homes, which is consistent with previous research [34, 39, 40]. While loneliness impacts people of all ages, research suggests that nursing home residents experience higher levels than older adults living in the community [19]. Despite the variance in prevalence estimates, a recent systematic review found that approximately 61% of older adults in nursing homes experience moderate levels of loneliness [19]. The authors also noted that in southern Europe loneliness rates among community-dwelling older adults ranged from 10% to 18% [41, 42]. However, among institutionalized individuals in the same region, their review showed rates as high as 63%. Although nursing homes may appear socially engaging, the loss of friends and family, limited meaningful resident interactions, and staff's lack of time for purposeful conversations can lead to sadness and loneliness [43]. Our findings reinforce the need to address loneliness in nursing homes, given its link to negative health outcomes and reduced wellbeing [44], with nursing home residents appearing to be particularly vulnerable.

Receiving at least a monthly visit was another factor in this study associated with increased QoL. Other studies have similarly emphasized the importance of social support from family or others in enhancing QoL among institutionalized older adults [21]. The positive impact of receiving visits on QoL, as observed in this and other studies [22, 37, 38], is consistent with the predominant personal social networks among Portuguese older adults, where family and friendship networks are the most common [24].

Access to outdoor spaces was also positively associated with QoL in our study. This may be explained by the fact that outdoor environments can foster a sense of home and freedom [45], promoting overall well-being. Additional research also supports this, suggesting that gardens are associated with better self-perceived health, reduced loneliness, and increased life satisfaction [46, 47]. Future work could explore in depth the impact of different types of outdoor spaces on QoL in these institutions.

Lastly, another relevant finding is that older adults who collaborated in the institution demonstrated significantly higher levels of QoL. Engaging in household chores, according to their preference, such as assisting with cleaning or meal preparation, may reflect the importance of remaining active in older age and continuing to perform purposeful daily activities in their current home. A study employing a service-learning methodology

**TABLE 5** | Crude and adjusted beta coefficients and the respective 95% confidence intervals for the association between individual and institutional characteristics with QoL.

| Individual and institutional characteristics                                 | QoL (WHOQOL-OLD score)         |                                        |
|------------------------------------------------------------------------------|--------------------------------|----------------------------------------|
|                                                                              | Crude $\beta$ (95% CI)         | Adjusted $\beta$ (95% CI) <sup>a</sup> |
| Participants-related characteristics                                         |                                |                                        |
| Sex (Reference: Female)                                                      | −0.679 (−6.011; 4.654)         | 0.940 (−3.044; 4.924)                  |
| Age (years)                                                                  | 0.240 (−0.062; 0.541)          | 0.182 (−0.040; 0.405)                  |
| Education (years)                                                            | −0.070 (−1.664; 1.524)         | —                                      |
| Married (Reference: all others)                                              | −3.309 (−10.360; 3.743)        | —                                      |
| Tobacco use (prior to institutionalization)                                  | −3.3494 (−13.136; 6.147)       | —                                      |
| Alcohol consumption (prior to institutionalization)                          | −1.310 (−6.679; 4.059)         | —                                      |
| UCLA-Loneliness Scale                                                        | <b>−0.966 (−1.160; −0.772)</b> | <b>−0.790 (−0.981; −0.599)</b>         |
| Nursing home-experience                                                      |                                |                                        |
| Duration of Institutionalization (years)                                     | 0.230 (−0.337; 0.797)          | —                                      |
| Sports activities <sup>b</sup>                                               | 3.863 (−1.824; 9.550)          | —                                      |
| Cultural activities <sup>b</sup>                                             | 1.636 (−8.041; 11.313)         | —                                      |
| Daily television viewing time (hours)                                        | 0.458 (−0.861; 1.776)          | —                                      |
| Collaboration in the institution chores                                      | <b>8.429 (2.637; 14.222)</b>   | <b>7.669 (3.220; 12.118)</b>           |
| Existence of another family member in the institution (user or collaborator) | 1.759 (−4.085; 7.603)          | —                                      |
| Visit frequency                                                              | <b>12.590 (6.754; 18.427)</b>  | <b>7.099 (2.450; 11.748)</b>           |
| Institutional characteristics                                                |                                |                                        |
| Type of institution (Reference: PSSI)                                        | −0.164 (−5.327; 4.999)         | —                                      |
| Total number of users                                                        | −0.039 (−0.214; 0.137)         | —                                      |
| Full-time socio-cultural animator                                            | 2.356 (−2.801; 7.513)          | —                                      |
| Physiotherapy services                                                       | −3.094 (−8.290; 2.103)         | —                                      |
| Location classification (Reference: rural)                                   | −1.138 (−7.190; 4.914)         | —                                      |
| Outdoor space                                                                | <b>9.247 (4.122; 14.372)</b>   | <b>6.519 (2.459; 10.579)</b>           |
| Access to sports activities                                                  | 1.671 (−5.232; 8.573)          | —                                      |
| Access to cultural activities                                                | 3.773 (−1.386; 8.931)          | —                                      |
| Constant                                                                     | —                              | 92 815 (70.903–114.727)                |
| Statistical significance (ANOVA)                                             | —                              | $F_{(6,146)} = 23.578$                 |
| Adjusted coefficient of determination                                        | —                              | $R_a^2 = 0.471$                        |

Note: Bold values indicate statistically significant associations ( $p < 0.05$ ).

Abbreviations:  $\beta$ , regression coefficient; CI, confidence interval; PSSI, Private Social Solidarity Institution;  $R_a^2$ , adjusted coefficient of determination; UCLA, University of California Los Angeles; WHOQOL-OLD, World Health Organization Quality of Life Assessment for Older Adults.

<sup>a</sup>All variables there were significant in the crude model were included in the multivariate model.

<sup>b</sup>Whether promoted by the institution they are in, by other entities, or by their own initiative.

also found that involving nursing home residents in household chores might enhance their sense of usefulness [48]. Even among nursing home residents with dementia, participation in daily activities, such as making coffee, setting the table, or watering plants, has been linked to improved QoL [49]. In this study, we gathered data on individual participation in different nursing home activities. However, given the cross-sectional nature of this study, these findings should be interpreted cautiously, as

reverse causation cannot be excluded. Future longitudinal research should clarify the directionality of this relation, and further explore how these activities are planned and the extent to which individuals take on an active role.

Several strengths can be found in this study. First, it contributes to the limited research on factors associated with QoL of cognitively preserved older adults living in nursing homes, a group

that can be considered difficult to reach. They are often considered a hard-to-reach or interview group due to barriers such as protective gatekeepers, as well as language barriers or functional or cognitive impairment of respondents [50]. However, it is not an unattainable goal [50], and older adults should be represented despite their living conditions [51]. Additionally, this study employed an instrument measurement widely used with older adults worldwide.

Some limitations of this study need to be considered. This study only evaluated nursing homes from the Center region of Portugal, which may limit generalizability to other regions. Nonetheless, it is worth noting that the study region had the highest old-age dependency ratio in 2022 [52].

Apart from data scarcity, the use of different methodologies to measure QoL in older adults makes the comparisons between studies challenging. WHOQOL-OLD, as used here, is a validated instrument capable of assessing the specific dimensions of older adults' QoL that are normally not included in QoL scales used for the general adult population, such as sensory problems and communication [53]. Future studies should continue exploring a broader range of individual and institutional factors affecting the QoL of older adults in nursing homes, using validated tools like WHOQOL-OLD.

Finally, we recognize that excluding individuals with cognitive impairment means these findings apply to cognitively healthier residents and may not be representative of the frailest older adults in nursing homes. Further research should be designed to include participants with cognitive impairment to understand if the relation of QoL with these individual and institutional factors remains the same.

Although they are often perceived as asexual, many residents in long-term care remain sexually active [54]. However, since sexuality and sexual expression are often overlooked in nursing homes; future studies should address its implication for the QoL in this population.

To conclude, the present study suggests that individual factors, such as collaborating on the institution chores and receiving at least a monthly visit can enhance QoL of older adults in nursing homes, while loneliness appears to contribute to its decrease. The existence of outdoor spaces might be an important factor associated with a higher QoL in this population. Due to the increasing number of older adults facing the need for nursing homes, understanding these factors is crucial to guide interventions and policies to improve their well-being. Research in this area can inform best practices and might, particularly in Portugal, alleviate the negative public perceptions of nursing homes, where nursing home admission is often seen as a step that substantially reduces QoL.

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## Ethics Statement

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Portuguese Central Regional Health Administration (Ref.: 10-2022).

## Consent

Written informed consent was obtained from all individual participants included in the study. No details of individual participants are described in this paper.

## Conflicts of Interest

The authors declare no conflicts of interest.

## Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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