Quality of Life in Women over 65 Years of Age Diagnosed with Osteoporosis

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Abstract: (1) Background: Today’s society is moving towards active aging, underlining the importance of understanding and improving quality of life (QoL). This QoL in women over the age of 65 years diagnosed with osteoporosis was compared with the QoL of the general population, and risk factors for osteoporosis related to QoL were identified. (2) Methods: This is an observational, descriptive, cross-sectional study with a personal interview. The study population was 704 women over 65 years of age diagnosed with osteoporosis as of 1 November 2018, based on medical records from four health centers of the eastern Valladolid urban health area. This was a random sample of 247 women stratified by health center. Information on osteoporosis risk factors, comorbidities, daily lifestyle habits, and QoL assessed with the EQ-5D was collected. QoL was modeled using sociodemographic variables, lifestyle, and clinical variables. (3) Results: Women with osteoporosis had a positive perception of their health (EQ-5D% VAS 64.9 ± 18.31). High EQ-5D QoL scores were obtained on the dimensions of mobility: 51.6% [95% CI (44.2%, 58.9%)]; self-care: 75.3% [95% CI (68.5%, 81.2%)]; activities of daily living: 71.4% [95% CI (64.4%, 77.6%)]; pain/discomfort: 25.8% [95% CI (19.8%, 32.6%)]; and anxiety/depression: 53.8% [95% CI (46.4%, 61.0%)]. (4) Conclusions: The QoL of the study group was no worse than the QoL of the general population, except for pain/discomfort and anxiety/depression. Age, highest educational level reached, inflammatory diseases, physical activity, and insomnia were independent predictors of QoL in women with osteoporosis.

Keywords: hip fracture; menopause; osteoporosis; quality of life; risk factors

1. Introduction

The population of Spain has one of the highest life expectancies at birth in Europe: 85.7 years for women and 80.4 years for men. The population of older people has become progressively more feminine (32% more women). The population pyramid is now inverted, with people over 65 years of age now representing 19.3% of the population of Spain, and people over 80 years of age, 6.1% [1,2].

Osteoporosis is a systemic skeletal disease whose prevalence is greater in women (4:1 compared to men). Osteoporosis is characterized by a decrease in bone density and strength, originating fragility and fractures over time. It generates significant economic and social costs, increased dependency, and diminished quality of life [3–6].

The incidence of hospital morbidity due to osteoporosis in the population over 65 years of age in Spain was 57.1% in 2017, a percentage that continues to rise. Osteoporotic fractures originate higher mortality, especially in people over 75 years of age, with important
functional consequences and a diminished quality of life in this population [7,8]. The mean hospital stay after a hip fracture due to fragility is about 9.8 days in Spain, and 76% of the cases involve women. Osteo-protective treatments are not widely used to prevent fractures, although the use of calcium and vitamin D increases in post-fracture patients [9].

An assessment of the quality of life of older adults implies evaluating their health status and relationship with their environment: 45.4% of the elderly perceive their health as good or very good, but women have a less favorable perception of their health than men (40.0%, vs. 52.3%) [10,11].

Population aging has increased the incidence of long-term disability and chronic diseases, as well as inequalities related to lifestyle. The life expectancy of women is less healthy in women than in men; women receive less economic benefits due to the situation of the labor market, maternity, and loss of employment, and, in turn, they are the main recipients of aid for autonomy and dependency, remote care, and residential care services [2].

Health and economic policies should promote active aging, and optimizing opportunities for health, participation, and security as a way to improve the quality of life of people as they age [1].

Diverse studies exist on quality of life and osteoporosis, and osteoporosis guidelines to standardize action protocols for diagnosed patients, but there are not enough studies addressing the relationship between risk factors for osteoporosis and quality of life [12–15].

Numerous instruments for measuring quality of life are known, including the EuroQol-5 Dimension questionnaire (EQ-5D), which is easy to administer in a cross-sectional study, allowing the self-assessment of health status at the time of implementation; the EQ-5D was used in the National Health Survey in Spain (ENSE 2011) in 2011, which was used for purposes of comparison in this study [11,16].

The objective of the study is to assess the quality of life in women over 65 years of age diagnosed with osteoporosis in comparison with the quality of life in the general population, as well as to identify the risk factors associated with osteoporosis that have the greatest impact on quality of life.

2. Materials and Methods

An observational, descriptive, cross-sectional study was carried out using quantitative tools to assess the quality of life of women over 65 years of age diagnosed with osteoporosis in the east Valladolid urban health area.

2.1. Population and Sample

We chose four urban health centers in the eastern area of Valladolid (La Victoria, Centro-Gamazo, Circunvalación, and Barrio España) that, in the opinion of the researchers, would serve to represent the sociodemographic variety in that area. We identified 704 women in these four centers with a diagnosis of osteoporosis in the computerized medical record (Medoracyl) as of 1 November 2018. A random sample of 247 women stratified by health center and proportionally allocated was obtained: 182 women completed the survey, 17 had severe cognitive impairment, 15 were untraceable, 13 refused to participate in the study, 8 surveys had data coding errors, and 12 were not completed due to work overload.

2.2. Inclusion Criteria

Women over 65 years of age diagnosed with osteoporosis who did not have severe cognitive impairment and who voluntarily agreed to participate in the study and gave informed consent were enrolled.

2.3. Variables and Risk Factors

A personal interview was carried out with the women in the study group, which addressed risk factors for osteoporosis and sociodemographic variables. The EQ-5D health questionnaire assesses quality of life through 5 dimensions: mobility, self-care, daily living...
activities, pain/discomfort, and anxiety/depression, each of which is scored from 1 to 3, where 1 indicates HIGH QoL, 2 MEDIUM QoL, and 3 LOW QoL for each dimension. The numerical result obtained from the combination of responses yielded an objective measure of the quality of life, called the EQ-5D health status, and a complementary value, called the Severity Index. The EQ-5D score was complemented by a visual analog scale (VAS), which each participant used to assess their subjective health status at the time of the survey. The Barthel Index for Activities of Daily Living, Lawton and Brody Instrumental Activities of Daily Living Index, and Folstein Mini-Mental State Examination were also included if they were recorded in the medical history. Healthy lifestyle habits such as exposure to sun, calcium intake, physical activity, dyslipidemia, and insomnia were considered, and measured using a Likert-type scale, which in some cases were summarized as the levels: low, medium, and high; or low and high. For alcohol consumption, physical activity, dyslipidemia, and insomnia, the results were grouped as: 0 points low; 1 to 2 points moderate; 3 to 4 points high. For sun exposure and calcium intake, it was determined that 0 to 2 points were classified as low, and 3 to 4 points were considered high [17].

2.4. Statistical Analysis

The qualitative variables were summarized as frequency and percentage (fr and %) and the numerical variables as mean and standard deviation (M ± SD). The 95% confidence intervals (95% CI) were obtained for the population percentages and means. The percentages obtained on the 5 dimensions of the EQ-5D were compared with those of the general population obtained in the ENSE 2011. Weighted estimates were obtained from the subsample of women from the ENSE 2011; the weights were based on the age distribution observed in our sample with the aim of ensuring comparability with our study. A test of equality for percentages was used to compare the equality of the frequencies on the EQ-5D dimensions between the women in the study group and those of the general population of the ENSE 2011. The EQ-5D health status obtained from the values of the 5 dimensions was categorized using quartiles. Using multinomial logistic regression models, the relationship between this categorized version of the EQ-5D health status and each explanatory variable was studied, removing the effect of age. Subsequently, a multinomial logistic regression model was estimated to predict values for the aforementioned categorized version of the EQ-5D health status as a function of the explanatory variables. The variables selected after applying a protocol to identify relevant variables, such as that described in Hosmer et al. were included in this model [18]. Based on this estimated model, a score was obtained to predict the quality of life, which is only a function of the explanatory variables. By categorizing this estimated score using quartiles, 4 groups of predicted quality of life were defined. Sensitivity and specificity values were calculated to evaluate the predictive capacity of the classification rules based on the adjusted model. p values of less than 0.05 were considered statistically significant. The statistical analyses were completed with R Analytics Software v4.0.

3. Results

The means and frequencies of the variables studied, risk factors for osteoporosis, and lifestyle and nutrition habits are shown in Table 1.

The EQ-5D survey results are summarized in Table 2. The EQ-5D health status score resulting from the objective assessment of quality of life using the five dimensions of the EQ-5D questionnaire was 66.7 ± 24.7 and the self-assessed VAS quality of life was 64.9 ± 18.31 on a scale from 0 to 100. The difference between the objective and subjective assessments was not statistically significant [p = 0.15, 95% CI (−4.3, 0.7)].

The results of comparing the EQ-5D dimensions of the study group and those of the women from the general population (ENSE 2011) are shown in Figure 1. The frequencies for the five dimensions were: mobility, self-care, daily living activities, pain/discomfort, and anxiety/depression.
Table 1. Distribution of risk factors for osteoporosis, lifestyle habits, and nutrition.

| Variables                             | n   | Mean ± SD or Freq (%) | 95% CI         |
|---------------------------------------|-----|-----------------------|----------------|
| Age                                   | 182 | 75.08 ± 6.97          | 74.06–76.1     |
| Age of Menarche                       | 179 | 13.28 ± 1.57          | 13.05–13.51    |
| Age of Menopause                      | 175 | 49.34 ± 4.81          | 48.62–50.06    |
| No. of Children                       | 177 | 2.28 ± 1.37           | 2.07–2.48      |
| Partner                               | 182 | 109 (59.9%)           | 52.5–66.8      |
| Secondary/University Studies          | 179 | 48 (27.3%)            | 21.2–34.3      |
| BMI                                   | 166 | 26.62 ± 4.81          | 25.88–27.35    |
| Smoker                                | 181 | 18 (9.9%)             | 6.4–15.2       |
| Alcohol-Mod                           | 182 | 12 (6.6%)             | 3.8–11.1       |
| Alcohol-Heavy                         | 182 | 7 (3.8%)              | 1.9–7.7        |
| Physical Activity-Mod                 | 182 | 80 (44%)              | 36.9–51.2      |
| Physical Activity-Heavy               | 182 | 86 (47.3%)            | 40.1–54.5      |
| Sun Exposure-Low                      | 181 | 76 (42%)              | 35.4–49.3      |
| Sun Exposure-High                     | 181 | 83 (45.9%)            | 38.8–53.1      |
| Calcium Intake-Low                    | 179 | 31 (18.9%)            | 12.5–23.5      |
| Calcium Intake-High                   | 179 | 133 (81.1%)           | 74.4–87.8      |
| Barthel Index                         | 168 | 92.86 ± 14.44         | 90.66–95.06    |
| Lawton Index                          | 107 | 7.1 ± 2.32            | 6.66–7.55      |
| Mini-Mental State Examination         | 131 | 26.66 ± 4.69          | 25.85–27.47    |
| Corticoids                            | 182 | 35 (19.2%)            | 13.8–25.7      |
| Thyroxin                              | 182 | 32 (17.6%)            | 12.5–23.8      |
| Antacids                              | 182 | 56 (30.8%)            | 24.3–37.9      |
| Furosemide                            | 182 | 15 (8.2%)             | 4.7–13         |
| Previous Fractures                    | 182 | 72 (39.8%)            | 32.8–47.2      |
| History Osteoporosis                  | 182 | 71 (40.1%)            | 33–47.7        |
| Diabetes                              | 182 | 24 (13.2%)            | 8.9–18.8       |
| Hypothyroidism                        | 182 | 41 (22.5%)            | 16.9–29.3      |
| Hyperthyroidism                       | 182 | 5 (2.7%)              | 1.1–6.1        |
| Hyperparathyroidism                   | 182 | 1 (0.5%)              | 0–2.8          |
| Renal Disease                         | 182 | 12 (6.6%)             | 3.7–11.1       |
| Inflammatory Disease                  | 182 | 68 (37.6%)            | 30.6–45        |
| Dyslipidemia-Mod                      | 178 | 37 (20.8%)            | 15.5–27.3      |
| Dyslipidemia-High                     | 178 | 79 (44.4%)            | 37.3–51.7      |
| Insomnia-Mod                          | 181 | 63 (34.8%)            | 28.3–42        |
| Insomnia-High                         | 181 | 81 (44.8%)            | 37.7–52        |

The quantitative variables are expressed as means and standard deviation (SD) and the qualitative values as frequency and percentages (%). There is a 95% confidence interval.

The percentage of women with osteoporosis who rated their quality of life as good in terms of the dimensions of mobility, self-care, and activities of daily life was not significantly lower than that observed in women from the general population (ENSE 2011). When making this comparison, women with severe impairment from the general population described in the ENSE 2011 cannot be eliminated because this information was not collected in the survey that year. However, even assuming a scenario in which all the women with severe cognitive impairment eliminated from our sample were outside the highest level of quality of life on these three dimensions, no statistical significance would appear in the previous comparisons. In the pain/discomfort and anxiety/depression dimensions, the percentage of women with osteoporosis with a good quality of life was at least 8.5% lower than the corresponding percentage in the general population (95% confidence). If this worst-case scenario of the women with severe cognitive impairment was eliminated from our study, the percentage of women with a good quality of life would be at least 12% higher among the women in the general population (95% confidence).
Table 2. EQ-5D. Results.

| EQ-5D                  | N   | Mean ± SD or Freq (%) | 95% CI     |
|------------------------|-----|-----------------------|------------|
| Mobility-Med CV        | 182 | 88 (48.4%)            | 41.1–55.8  |
| Mobility-Low CV        | 182 | 0 (0%)                | 0–2.1      |
| Self-Care-Med CV       | 182 | 44 (24.2%)            | 18.2–30.9  |
| Self-Care-Low CV       | 182 | 1 (0.5%)              | 0–2.8      |
| Usual Activities-Med CV| 182 | 47 (25.8%)            | 19.8–32.6  |
| Usual Activities-Low CV| 182 | 5 (2.7%)              | 1.1–6.1    |
| Pain-Med CV            | 182 | 108 (59.3%)           | 51.9–66.3  |
| Pain-Low CV            | 182 | 27 (14.8%)            | 10.3–20.7  |
| Anx/Depress-Med CV     | 182 | 68 (37.4%)            | 30.4–44.8  |
| Anx/Depress-Low CV     | 182 | 16 (8.8%)             | 5.3–13.8   |
| VAS Score              | 182 | 64.9 ± 18.31          | 62.22–67.58|
| EQ-5D Health Status    | 182 | 66.7 ± 24.7           | 63.1–70.3  |
| Severity Index         | 182 | 68.4 ± 31.1           | 63.9–73.0  |

The quantitative variables are expressed as means and standard deviation (SD) and the qualitative values as frequency and percentages (%). There is a 95% confidence interval.

Figure 1. Comparison of the EQ-5D dimensions of the women with osteoporosis in the study group with the ENSE 2011 women.

The relationship between the EQ-5D health status, or objective assessment of the quality of life of the elements of the sample, and the explanatory variables after removing the effect of age is shown in Table 3.

Age, educational level achieved, presence of inflammatory diseases, physical activity, and insomnia are independent predictors of the quality of life in women over 65 years of age. Classification rules based on this score had a sensitivity/specificity for identifying low EQ-5D health status scores of 68.1%/77.9% and 73.6%/70.9%.

The relationship between the VAS score and the groups derived from categorizing the predicted quality of life score by quartiles is shown in Figure 2.
Older women are often users of primary care services; they live longer than men; they receive fewer economic benefits; and inequalities related to lifestyle factors tend to increase among women over the years [1].

The purpose of this study was to know the quality of life of women over 65 years of age diagnosed with osteoporosis (which has a higher prevalence in women), and to identify the factors that most affect the assessments that people make of their own health and well-being in order to improve them.

The quality of life of women over 65 years of age decreases with the presence of comorbidities such as chronic diseases, increasing their level of dependency. The presence of inflammatory diseases, such as arthritis or osteoarthritis, is an independent predictor of quality of life [13].

The study of quality of life encompasses two aspects: one subjective and the other objective. No statistically significant difference was found between the two in this study.

**Figure 2.** Relationship between quality of life (VAS) and the groups resulting from categorizing the score obtained by the estimated predictive model.

| Variable       | 0/NO | 1/YES | 2  | 3  | 4  | Univariate p-Value (–Age) | Multivariate p-Value |
|----------------|------|-------|----|----|----|--------------------------|----------------------|
| Age            | 73.6 | 75.8  | 66.9| 54.3|    | <0.001 ***               | 0.005 **             |
| Menarche       | 58.5 | 71.3  | 67.1| 65.7|    | 0.895                    |                      |
| Menopause      | 65.5 | 65.3  | 67.7| 67.8|    | 0.688                    |                      |
| No. Children   | 63.4 | 71.2  | 64.6|    |    | 0.335                    |                      |
| Partner        | 62.8 | 69.3  |    |    |    | 0.851                    |                      |
| Education      | 59.1 | 64.1  | 76.0|    |    | 0.001 **                 | 0.002 **             |

**Table 3.** Relationship between VAS and the explanatory variables. In the dichotomous variables, 0 is NO and 1 is YES. The values 0, 1, 2, and 3 for age, menarche, menopause, and BMI correspond to the respective values for the first, second, third, and fourth quartiles. For the number of children, 0 corresponds to no children, 1 to one child, and 2 to two or more children. For the variables physical activity, sun exposure, and calcium intake, the scale from 0 to 4 corresponds to a Likert-type scale where 0 indicates absence and 4 indicates maximum adherence/exposure to the associated factor.
Table 3. Cont.

|                  | 0/NO | 1/YES | 2     | 3     | 4     | Univariate p-Value (–Age) | Multivariate p-Value |
|------------------|------|-------|-------|-------|-------|--------------------------|-----------------------|
| BMI              | 68.9 | 67.0  | 69.2  | 62.8  | 62.8  | 0.03 *                   |                       |
| Tobacco          | 66.7 | 67.9  | 67.9  | 57.1  | 57.1  | 0.286                    |                       |
| Alcohol          | 66.1 | 74.4  | 65.9  | 76.0  | 76.0  | 0.652                    |                       |
| Physical Act     | 44.8 | 52.9  | 69.9  | 72.9  | 75.4  | <0.001 ***               | 0.004 **              |
| Sun Expos        | 54.0 | 65.0  | 66.5  | 63.7  | 74.1  | 0.009 **                 |                       |
| Ca Intake        | 68.2 | 50.0  | 74.4  | 64.8  | 66.6  | 0.994                    |                       |
| Corticoids       | 69.5 | 54.8  |       |       |       | 0.001 **                 |                       |
| Thyroxin         | 67.7 | 62.2  |       |       |       | 0.155                    |                       |
| Antacids         | 70.5 | 58.1  |       |       |       | 0.011 *                  |                       |
| Furosemide       | 67.1 | 62.4  |       |       |       | 0.931                    |                       |
| Fractures        | 71.2 | 59.9  |       |       |       | 0.011 *                  |                       |
| History Osteopor | 69.9 | 62.0  |       |       |       | 0.013 *                  |                       |
| Diabetes         | 67.8 | 59.5  |       |       |       | 0.357                    |                       |
| Hypothyroidism   | 68.5 | 60.5  |       |       |       | 0.042 *                  |                       |
| Hyperthyroidism  | 66.6 | 70.4  |       |       |       | 0.587                    |                       |
| Hyperparathy     | 66.7 | 70.1  |       |       |       | 0.852                    |                       |
| Renal Disease    | 68.8 | 37.9  |       |       |       | <0.001 ***               |                       |
| Inflammatory Dis | 72.3 | 57.5  |       |       |       | <0.001 ***               | 0.007 **              |
| Dyslipidemia     | 67.6 | 71.3  | 63.4  | 67.4  | 63.9  | 0.53                     |                       |
| Insomnia         | 78.5 | 67.4  | 68.5  | 58.3  | 60.9  | <0.001 ***               | 0.002 **              |

* p < 0.05; ** p < 0.01; *** p < 0.001.

4. Discussion

Older women are often users of primary care services; they live longer than men; they receive fewer economic benefits; and inequalities related to lifestyle factors tend to increase among women over the years [1].

The purpose of this study was to know the quality of life of women over 65 years of age diagnosed with osteoporosis (which has a higher prevalence in women), and to identify the factors that most affect the assessments that people make of their own health and well-being in order to improve them.

The quality of life of women over 65 years of age decreases with the presence of comorbidities such as chronic diseases, increasing their level of dependency. The presence of inflammatory diseases, such as arthritis or osteoarthritis, is an independent predictor of quality of life [13].

The study of quality of life encompasses two aspects: one subjective and the other objective. No statistically significant difference was found between the two in this study. The quality of life of the women studied was no worse than in the general population, except for the pain/discomfort and anxiety/depression dimensions [12].

Some risk factors for osteoporosis that appeared to be significantly related to quality of life, such as age, the presence of inflammatory or kidney diseases, and treatment with corticosteroids, have also been noted in articles and management guidelines on osteoporosis [7,13–15,19,20].

Healthy lifestyle habits, such as a balanced diet, regular physical activity, and avoiding a sedentary lifestyle, have been identified as protective factors in relation to osteoporosis and bone fragility, and are associated with a better quality of life [21,22]. In the survey conducted, calcium intake, the only dietary detail addressed, did not appear to be related with a better quality of life.

Adequate nocturnal rest has not typically been related to osteoporosis, although it has been related to optimal quality of life, and was also identified in the study [23,24].

The higher the level of education attained, the better the perceived quality of life is among the elderly; however, the Spain Health System Report in 2018 indicates that its influence has decreased in the last 10 years [25].
Rules based on osteoporosis risk factors can be defined to predict quality of life. Furthermore, if these risk factors are controlled, the effects of osteoporosis will be lessened. It would be advisable to treat inflammatory pathologies that cause pain, as well as anxious-depressive symptoms in these women in order to improve their quality of life. To this end, it is advisable to apply pharmacological and non-pharmacological programs; the latter is based on nursing care and promotion of the active patient [26].

**Limitations**

The study was not completed with all the women in the sample because only 79% of the selected women responded. As the ENSE survey did not consider severe cognitive impairment until 2017, when the EQ-5D was not used, we could not eliminate the women with cognitive impairment for comparison with the general population.

**5. Conclusions**

Except for having pain and anxiety or depression, the quality of life of osteoporotic women was no worse than that of the general population.

The results of the study confirm that age, educational level achieved, presence of inflammatory diseases, physical activity, and insomnia are five multivariate predictors of quality of life.

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**References**

1. La Evaluación del Envejecimiento Activo—EnR. Available online: [https://envejecimientoenred.es/la-evaluacion-del-envejecimiento-activo/](https://envejecimientoenred.es/la-evaluacion-del-envejecimiento-activo/) (accessed on 29 March 2022).
2. Pérez Díaz, J.; Abellán García, A.; Aceituno Nieto, P.; Ramiro Fariñas, D. Un Perfil de las Personas Mayores en España, 2020. Indicadores Estadísticos Básicos; Informes Envejecimiento en red: Madrid, Spain, 2020; pp. 1–39.
3. WHO Quality of Life Assessment Group. What quality of life? *World Health Forum* **1996**, *17*, 354–356.
4. Díaz Curiel, M.; Garcia, J.J.; Carrasco, J.L. Prevalence of osteoporosis assessed by densitometry in the Spanish female population. *Med. Clin.* **2001**, *116*, 86–88. [CrossRef]
5. Aizpurua, I.; Álvarez, M.; Echeto, A.; Etxebarria, I.; Fernández, J.; Gardeazabal, M.J.; Martínez, L.; Mendoza, C.; Ruibal, A.; Quintan, M.; et al. *Consenso Sobre la Osteoporosis Postmenopáusica en la CAPV*; Osakidetza-Servizo Vasco de Saúd: Bilbao, Spain, 2015; pp. 1–16.
6. Hernlund, E.; Svedbom, A.; Ivergård, M.; Compston, J.; Cooper, C.; Stenmark, J.; McCloskey, E.V.; Jönsson, B.K.J.A.; Kanis, J.A. Osteoporosis in the European Union: Medical management, epidemiology and economic burden. A report prepared in
collaboration with the International Osteoporosis Foundation (IOF) and the European Federation of Pharmaceutical Industry Associations (EFPIA). Arch. Osteoporos. 2013, 8, 136. [CrossRef] [PubMed]

7. Aguilera-Barreiro, M.A.; Rivera-Márquez, J.A.; Trujillo-Arriaga, H.M.; Ruiz-Acosta, J.M.; Rodríguez-García, M.E. Impact of risk factors for osteoporosis on bone mineral density in perimenopausal women of the City of Querétaro, México. Arch. Latinoam. Nutr. 2013, 63, 21–28.

8. Díaz Curiel, M. Osteoporosis: Concept. Pathophysiology. Clinical. Epidemiology. Rev. Osteoporos. Metab. Miner. 2018, 10, 2–4.

9. Sáez López, P.; González Montalvo, J.I.; Ojeda Thies, C.; Pareja Sierra, T. National Registry of Hip Fractures. Annual Report; IdiPAZ: Madrid, Spain, 2019; pp. 1–88.

10. INE. Instituto Nacional de Estadística. Available online: https://www.ine.es/dyngs/INEbase/es/categoria.htm?c=Estadistica_P&cid=1254735572981 (accessed on 29 March 2022).

11. ENSE. Encuesta Nacional de Salud. España. 2017. Available online: https://www.sanidad.gob.es/estadEstudios/estadisticas/encuestaNacional/encuestaNac2017/ENSE2017_notatecnica.pdf (accessed on 29 March 2022).

12. Lizán Tudela, L.; Badia Llach, X. Quality of life evaluation for osteoporosis. Atención. Primaria 2003, 31, 126–133. [CrossRef]

13. Manterola, C.; Urrutia, S.; Otzen, T. Health-related Quality of Life. Measurement Tools to Assessing Upper Gastrointestinal Surgery Outcomes. Int. J. Morphol. 2013, 31, 1517–1523.

14. Cosman, F.; de Beur, S.J.; LeBoff, M.S.; Lewiecki, E.M.; Tanner, B.; Randall, S.; Lindsay, R. Clinician’s Guide to Prevention and Treatment of Osteoporosis. Osteoporos. Int. 2014, 25, 2359–2381. [CrossRef] [PubMed]

15. Kanis, J.A.; McCloskey, E.V.; Johansson, H.; Cooper, C.; Rizzoli, R.; Reginster, J.Y.; The Scientific Advisory Board of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO); The Committee of Scientific Advisors of the International Osteoporosis Foundation (IOF). European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporos. Int. J. Establ. Result Coop Eur. Found. Osteoporos. Natl. Osteoporos. Found. USA 2013, 24, 23–57. [CrossRef] [PubMed]

16. Cabasés, J.M. The EQ-SD as a measure of health outcomes. Gac. Sanit. 2015, 29, 401–403. [CrossRef] [PubMed]

17. Fabila Echaury, A.M.; Minami, H.; Izquierdo Sandoval, M.J. La Escala de Likert en la evaluación docente: Acercamiento a sus características y principios metodológicos. Perspect. Docentes 2012, 50, 31–40.

18. Hosmer, D.W., Jr.; Lemeshow, S.; Sturdivant, R. Applied Logistic Regression, 3rd ed.; Wiley: Hoboken, NJ, USA, 2000; pp. 1–528.

19. Urruña, M.A.; Caqueo-Urquiola, A. Quality of life: A theoretical review. Ter. Psicol. 2012, 30, 61–71.

20. Antón Jiménez, M.; Van Kan, G. Tratado de Geriatria para Residentes, 1st ed.; Sociedad Española de Geriatría y Gerontología SEGG: Madrid, Spain, 2006; pp. 1–782.

21. de Hoyos Alonso, M.C.; Gorroño-Gotita Iturbe, A.; Martín Lesende, I; Baena Díez, J.M.; López-Torres Hidalgo, J.; Magán Tapia, P.; Benito, M.A.A.; Herreros, Y.H.; Grupo de Actividades Preventivas en los Mayores del PAPPS. Actividades preventivas en los mayores. Actualización PAPPS 2018. Atención. Primaria 2018, 50, 109–124. [CrossRef]

22. Narango, A.; Rosas, J.; Ojeda, S.; Salas, E. Management of osteoporosis in primary care before and after the result of densitometry: Treatments in real practice versus the recommended by guidelines. CANAL study. Reumatol. Clin. 2013, 9, 269–273. [CrossRef] [PubMed]

23. Lampio, L.; Polo-Kantola, P.; Kauko, T.; Aittokallio, J.; Saarensranta, T. Sleep in midlife women: Effects of menopause, vasomotor symptoms, and depressive symptoms. Menopause 2014, 21, 1217–1224. [CrossRef] [PubMed]

24. Baker, F.C.; Lampio, L.; Saarensranta, T.; Polo-Kantola, P. Sleep and sleep disorders in the menopausal transition. Sleep Med. Clin. 2018, 13, 443–456. [CrossRef] [PubMed]

25. Bernal-Delgado, E.; Garcia-Armesto, S.; Oliva, J.; Sánchez Martínez, F.I.; Repullo, J.R.; Peña-Longobardo, L.M.; Ridaolópez, M.; Hernández-Quevedo, C.; World Health Organization. Spain: Health system review. Health Syst. Transit. 2018, 20, 1–179. [PubMed]

26. Lata, P.F.; Elliott, M.E. Patient Assessment in the Diagnosis, Prevention, and Treatment of Osteoporosis. Nutr. Clin. Pract. 2007, 22, 261–275. [CrossRef] [PubMed]