



EXAMINING THE QUALITY OF LIFE IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS: A REVIEW OF THE LITERATURE

Orthopaedics

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ABSTRACT

This literature review explores the assessment of quality of life (QoL) in postmenopausal women with osteoporosis. QoL is a multidimensional concept that encompasses various aspects of life, including health status. Health-related quality of life (HRQoL) questionnaires are commonly used to assess the physical, mental, and social well-being of individuals with osteoporosis. The purpose of the literature review examines the questionnaires, factors related to QoL of Post-menopausal women with osteoporosis. The review articles published from January 1999 to December 2022. The electronic data bases were searched and 18 articles were identified potentially relevant. The findings suggest that generic questionnaires may not adequately capture the specific aspects of the disease that significantly impact QoL. Disease-specific questionnaires may provide a more comprehensive assessment of QoL. Factors that influence the QoL of postmenopausal women with osteoporosis include physical limitations, pain, fear of fractures, and emotional distress. Addressing these factors and implementing appropriate interventions can lead to improvements in QoL and overall outcomes. Although there is some existing evidence on the QoL of postmenopausal women with osteoporosis, more research is needed to gain a deeper understanding of the specific aspects that significantly affect QoL and to develop targeted interventions.

KEYWORDS

Osteoporosis, Fracture, Post-Menopausal Women, Quality of Life (QoL), Questionnaire

INTRODUCTION

Quality of life (QoL) is a paramount consideration for postmenopausal women living with osteoporosis, and should not be ignored. Therefore, studies on QoL will be integrated into this literature review. QoL is a generic concept that refers to having a 'good life' or living with a high quality of experience.¹ It encompasses various aspects of life, such as health status, environmental, spiritual, and financial factors.² Health status is a subset of QoL which is known as health-related quality of life (HRQoL); a multidimensional concept that includes the individual's physical, social, cultural, emotional, and functional well-being.³ In clinical studies, HRQoL is often known as 'QoL'.⁴

Assessing HRQoL is imperative as an indicator of clinical development in the treatment of patients with osteoporosis and fractures. This assessment will help us to predict the functional changes which occur as a result of alteration in HRQoL as well as to understand the conditions that would lead to developing better osteoporosis management and reducing the risk of fractures. This assessment is also a fundamental aspect of health science research and clinical trials.^{4 & 5}. Therefore, it is important to assess the HRQoL of postmenopausal women with osteoporosis and fractures in an objective way by using HRQoL questionnaires.^{6 & 7}

HRQoL questionnaires reflect the impact of healthcare interventions on health aspects such as physical, mental, and social well-being and can be classified as generic or disease-specific.^{5 & 8}. Although generic questionnaires on HRQoL include unnecessary information about specific diseases, they allow for the comparison of different diseases.⁵. Those generic questionnaires which are used to assess the HRQoL of postmenopausal women with osteoporosis have limitations in assessing the detailed, specific aspects of osteoporosis.⁸. Some studies have suggested that certain relevant and important aspects to people with osteoporosis such as fear of falling, suffering a bone fracture, inability to adequately carry out activities of daily living, and despair about an uncertain future compromise the QoL of this group, and yet are not addressed in these generic questionnaires.^{5 & 9}. The omission of these osteoporosis-specific aspects could lead to unreliable evaluation of HRQoL in patients with osteoporosis. The most common generic questionnaires which are used to assess HRQoL are the Nottingham Health Profile (NHP), the Sickness Impact Profile (SIP), Short Form 36 of the Medical Outcomes Study (SF-36), and the Euro QoL.¹

Questions Of The Review

1. What are the different types of questionnaires used to assess the QoL in Post-Menopausal women with osteoporosis?
2. What are the factors affecting QoL of Post-menopausal women

with osteoporosis?

3. Is there enough evidence on the QoL of Post-menopausal women with osteoporosis from the previous studies?

Search Strategy

The authors conducted a comprehensive review of published literature on the quality of life (QoL) of postmenopausal women with osteoporosis. They utilized various online databases such as MEDLINE (Ovid), Embase, PsycINFO: Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, Applied Social Sciences Index, and British Nursing Index to search for relevant publications. The search terms employed in this review encompassed various aspects such as postmenopausal, menopause, osteoporosis, bone loss, bone weakness, bone tear, bone density, bone mass, bone fracture, and QoL/HRQoL (Health-Related Quality of Life) or Quantitative Research.

Inclusion Criteria

Publications were included in the review if (i) they were original research studies and included data obtained from QoL questionnaires, (ii) they focused on the QoL of postmenopausal women with osteoporosis/ fractures, (iii) they employed a quantitative research approach for data collection, and (iv) they were written in English. Unpublished research data (grey literature) were not included. Databases were searched for studies published from January 1999 to December 2022.

Selection Criteria

The review included articles from international peer-reviewed journals that utilized various research approaches such as cross-sectional, observational, case study, retrospective, and clinical trials. All articles published between 1999 and 2022 on the QoL of postmenopausal women with osteoporosis were considered for the review. A total of 421 relevant studies were found, with 16 identified through the search strategy and two through the references of relevant studies. Only studies that met the selection criteria were included in the literature review. Out of the 18 potentially relevant articles, data was extracted, edited, and abstracted into a standardized format. The data extraction process is illustrated in Figure 1 of the PRISMA flow diagram, indicating the flow of information.²³

Data Collection And Analysis

The reviewers all took part in examining the quality of the searched research studies and were involved in extracting the data. The authors reviewed all 18 studies to assess their research approach, sample, and population, setting, questionnaire, and factors related to the QoL of

post-menopausal women with osteoporosis. The studies also included the results and outcomes of the research.

Results Of The Search Strategy

The review included 18 articles from various countries including Italy, India, France, Spain, Croatia, Romania, Belgium, Brazil, UK, USA, and Canada. Table-1 presents a summary of the studies. All the included studies focused on the use of questionnaires to determine the QoL in postmenopausal women with osteoporosis. Some studies also explored the factors influencing and complications faced by these women.

DISCUSSION

There are a number of disease-specific questionnaires for osteoporosis, including the Osteoporosis Quality of Life Questionnaire (OQLQ), the Quality-of-Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO), and the Osteoporosis Assessment Questionnaire (OPAQ)⁸. However, these questionnaires have a large number of questions that take a long time to administer and are not practical to be used in clinical research and in practice, being problematic for both the healthcare personnel and patients⁸. Therefore, it has been recommended that a shorter HRQoL questionnaire be developed in order to minimise time and effort, as well as to increase patient interest⁹. Thus, the shorter form of the HRQoL questionnaire needs to be psychometrically robust, reliable, valid, and capable of detecting real changes in perceived health status among patients with osteoporosis.

The mini OQLQ is a self-reported questionnaire that requires approximately 3 minutes to complete. As a result, the Mini-Osteoporosis Quality of Life Questionnaire (mini-OQLQ) was developed from the OQLQ to assess pharmacological treatments and physical rehabilitation programmes⁸. It has only 10 items, in contrast to the original OQLQ, which has 30 items, and yet both of these questionnaires have the same five domains: symptoms, physical function, activities of daily living, emotional function, and leisure. Furthermore, the 31-item Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO-31) was developed as a shortened version of QUALEFFO in order to evaluate the QoL of patients with osteoporotic vertebral fracture⁵. Both the QUALEFFO-31 and the original QUALEFFO differ in the number of items and in their QoL domains, in that the former one has only 31 items while the longer one has 48 items. Moreover, the shorter version of QUALEFFO consists of three domains; pain, physical function, and mental function, whereas the original version of QUALEFFO comprises five domains: pain, physical function, social function, general health perception, and mental function⁵.

In addition to the above osteoporosis-specific questionnaire, the Osteoporosis Assessment Questionnaire Short Version (OPAQ SV) is a self-reported instrument that assesses QoL in postmenopausal women with osteoporosis and fractures⁵. The original OPAQ consists of five items that assess overall well-being and another 79 items that are grouped into 4 domains; physical function, psychological status, symptoms, and social interaction, whilst the OPAQSV has only 34 items addressing three domains; physical function, emotional status, and symptoms⁶. The OPAQSV has limitations because it is not able to collect data related to the patient's daily activities or social status⁸.

It is important to highlight that the choice of the appropriate questionnaire which should be used to assess the QoL of postmenopausal women with osteoporosis depends on the type of research and on the research question asked; each instrument has advantages and drawbacks. Also, the majority of these questionnaires are available in English, and therefore, it is recommended that before they could be used for people with other languages/cultures they should be translated and checked for their validity, reliability, and cultural appropriateness. Since these questionnaires are self-reported, they are not suitable for illiterate participants unless the researcher interviews the participants or reads the questions for them. To conclude, it is recommended that both a generic and disease-specific osteoporosis questionnaire is used in order to assess the HRQoL in postmenopausal women with osteoporosis.

There are very few studies that explore the influence of low bone mineral density (BMD) alone on HRQoL in postmenopausal women^{10, 11 & 12}. A cross-sectional study aimed to assess the QoL in 361 asymptomatic, ambulant, postmenopausal women who were sent by their general practitioners to check their BMD as part of a screening

program. Based on their BMD results, the participants were grouped into four categories; normal BMD, osteopenia, osteoporosis, and osteoporosis with fracture, and their HRQoL was assessed through the QUALEFFO questionnaire. The results show that there was a significant variation ($p < 0.05$) shown in three domains, including pain, physical function, and general health perception between women with normal BMD and those with osteoporosis¹⁰. However, it is important to highlight that these results were based on only one specific osteoporosis questionnaire.

In contrast, another study led to insignificant results where a correlational study assessed the relationship between change in BMD and HRQoL over a 3-year period in postmenopausal women with osteoporosis without incident of osteoporotic fracture. In this study, the specific QUALity of Life questionnaire in OSTeoporosis (QUALIOST) was used, as developed from the generic questionnaire short-form health survey 36 (SF-36) in order to focus on domains related to osteoporosis that was not covered in SF-36. After 3 years of follow-up, few postmenopausal women with osteoporosis seemed to obtain clinically significant changes with QUALIOST. However, it is important to highlight that only 432 subjects received both questionnaires (QUALIOST and SF-36), although the number of participants included at the start of the study was 1838. Moreover, only 63% of them had baseline values of BMD and HRQoL. Therefore, it is recommended that a bigger sample size is included, with the use of triangulation for HRQoL questionnaires (generic and osteoporosis specific)¹¹.

In addition to the above studies, a cross-sectional study aimed to evaluate QoL in postmenopausal women with osteoporosis with combined QoL questionnaires; generic and specific (SF-36 & QUALEFFO 41). A total of 220 postmenopausal women were included; 110 of these participants had been diagnosed with osteoporosis, either with or without vertebral fracture (VF), and 110 were without osteoporosis. In general, the results of both questionnaires show that the women with osteoporosis with or without VF had worse QoL scores in all domains. In regard to the QUALEFFO 41 questionnaire, there was a statistically significant difference in the following domains: pain, physical function, social function, general health perception, mental function, and total score between women with osteoporosis and women without osteoporosis ($p < 0.05$). Similarly, the SF-36 questionnaire shows a statistically significant difference between the two groups ($p < 0.05$) in the following domains: physical functioning, physical aspects, pain, general health status, vitality, emotional aspects, social functioning, and mental health¹². Obesity and lack of physical activity are two factors that directly affect HRQoL in postmenopausal women with osteoporosis, and this was evident through impairment in domains including pain, physical function, and mental function in women with osteoporosis.

Those women who were in paid work had better scores on physical function, general health perception, and total scores than those who were not. However, there was no statistical difference in any domain between the women with osteoporosis either with VF or without VF. This finding differs from other studies, and this might be owing to the inclusion of women with radiologic VF, which is usually asymptomatic, and because the number of women with VF was lower compared to women with osteoporosis without VF. There was a good correlation between both questionnaires, particularly in such domains as pain, physical function, general health perception, and total scores. Therefore, it is recommended that triangulation of generic and osteoporosis-specific disease questionnaires is used in order to detect statistical differences in HRQoL domains among postmenopausal women with or without VF. Since this study did not provide data on HRQoL and the number and location of VF, more studies should be conducted to address these variables on HRQoL¹².

Another cross-sectional study was conducted in India to assess the quality of life among women without osteoporosis which used SF-36¹³. The study found that participants had lower scores in role limitations due to emotional problems (29.99±9.56) and in the domain of Mental Component Summary (MCS) compared to Physical Component Summary (PCS) (43.39±4.57 vs 47.78±4.53)¹³. The relationship between PCS and MCS scores of QoL and demographic variables such as age, religion, education, occupation, and BMD was examined. The results indicated that there was no significant association between PCS scores and age (p -value=0.84), religion (p -value=0.94), occupation (p -value=0.805), and BMD (r =-0.058, p -value>0.05)¹³.

Literature on QoL in postmenopausal women with osteoporotic fracture shows that there are variations in QoL scores, and this is related to the location, number, and severity of the fracture¹⁴. Two studies concluded that the HRQoL in postmenopausal women with VF was worse than those women without VF and that this was statistically significant even in those women who had only one fracture ($p<0.05$). However, the above two studies measured the HRQoL with both a generic and osteoporosis-specific questionnaire^{4&15}.

However, there was a progressive worsening effect on HRQoL with increasing numbers of VFs, and this was evident in declining scores for HRQoL domains including pain, physical function, general health perception, and total scores ($p<0.05$)^{4&15}. In contrast to other domains, the scores for mental function did not show progressive changes in the number of VFs¹⁵. Moreover, the number of postmenopausal women complaining of back pain and disability increased with increasing numbers of severe VFs. This finding was consistent with different age groups; below 65 years, 65-71 years, and above 71 years, and with the other two questionnaires (NHP and EQ-5D)^{4&15}.

Equally, a cross-sectional study conducted by Fechtenbaum et al.,¹⁶ found results consistent with Oleksik et al.,¹⁵ in all domains of HRQoL yet the scores for the pain domain did not show any differences among postmenopausal women with or without VF or within postmenopausal women based on the number and grade of VF^{15&16}. In spite of the fact that Fechtenbaum et al. used only one osteoporosis-specific questionnaire (QUALEFFO) and recruited a smaller sample size compared with Oleksik et al. The in-depth results highlighted that QoL was worst in those postmenopausal women with a recent VF, provided they had already sustained a previous vertebral deformity, in comparison to those who had just had a new VF without any past history of previous VF. However, cross-sectional studies have limitations in comparing the changes in QoL between postmenopausal women with fractures and those without fractures^{15&16}. In line with previous studies, Silverman et al. highlighted in both their correlational studies which aimed to identify the relationship between HRQoL and prevalent and incident VF in postmenopausal women with osteoporosis, that postmenopausal women with prevalent osteoporotic VF were significantly more affected in their physical function, emotional status, clinical symptoms, and overall HRQoL (all $p<0.01$) than those women without prevalent VF throughout at the baseline measurement of VF by radiography. However, global QoL and physical functioning showed a greater decline in those postmenopausal women with prevalent VF with each subsequent fracture over the three years follow-up with measurement of VF. Conversely, when HRQoL was compared between postmenopausal women with incident VF with those with prevalent VF, researchers found a significant decrease in OPAQ scores on physical function, emotional status, clinical symptoms, and overall HRQoL (all $p<0.001$). However, both studies used a valid, osteoporosis-specific questionnaire (OPAQ) that was administered on multiple occasions; at baseline, 12 months, and at the termination of the study, and this might enhance the rigour of the results^{5&17}.

Few researchers have also investigated the impact of the number of fractures on the QoL of postmenopausal women. It was obvious in QUALEFFO scores that QoL was worse in physical function ($p=0.055$) and social function ($p=0.027$) in postmenopausal women with one VF. However, the QoL grew worse when the number of fractures increased, as indicated by a higher score in physical function ($p=0.001$), social function ($p=0.027$), and the total score ($p=0.027$)¹⁶. In an observational prospective study, that the presence of VF in osteoporosis-diagnosed women has a low or no correlation with HRQoL scores. This might be owing to other factors such as personal, clinical, and socio-demographic issues; those women with low educational levels had low HRQoL, and also those women with high BMI had lower HRQoL than those low BMI; this finding was consistent with de Oliveira Ferreira et al. (2009), as discussed in the previous section. It is important to highlight the HRQoL of postmenopausal women with osteoporosis. Furthermore, it was measured with a newly developed questionnaire which is known as ECOS -16, and this was constructed from two valid and reliable questionnaires (QUALEFFO and OQLQ). Although ECOS-16 is a self-administered questionnaire, it was acceptable to be administered by health care personnel or experienced interviewers in special cases such as women with illiteracy or eyesight difficulties, and these strategies enhanced the response rate, which was 99.3^{8&12}.

Some osteoporosis researchers studied QoL with a fracture in more depth and compared the QoL of postmenopausal women with VFs in

different locations^{18, 19 & 20}. Many studies highlight that the QoL of postmenopausal women with lumbar fractures differs from those with thoracic fractures. Those women who had L1-L4 fracture had significantly worse HRQoL than those women with thoracic fracture (T4-T12), and this was noticeable for the following domains: pain, physical function, general health perception, and also in total scores ($p<0.05$). However, Salaffi et al.¹⁸ conducted a case-control study in which postmenopausal women with VF were matched with asymptomatic osteoporotic women their age whereas Oleksik et al. (2000) did a cross-sectional survey. In contrast, Fechtenbaum et al.¹⁶ used QUALEFFO to measure the HRQoL of postmenopausal women with VF and they found that the location of fractures had a low impact on HRQoL. Since the QUALEFFO is a disease-targeted instrument that measures characteristics relevant to osteoporosis, it may be more sensitive in detecting differences between participants with VF and those without VF as compared with a generic questionnaire. However, the potential reasons for such differences remained unexplained.

A study analysed the QoL of postmenopausal women with osteoporotic hip fractures and compared it with those without fractures with OQLQ²⁰. There was a marked decline in QoL scores for emotions, physical function, and leisure in women with hip fractures; furthermore, this finding was consistent with study⁷. However, Cvijetic et al.,²⁰ relied on interviews in their study, as the subjects were interviewed by two physicians, whilst Adachi et al.⁷ used secondary data obtained from Canadian Database Osteoporosis and Osteopenia (CANDOO) patients. In general, there have been few studies conducted to assess the HRQoL of postmenopausal women with osteoporotic hip fractures, and these were done in Canada and Croatia. Therefore, it is recommended that such studies are conducted to assess HRQoL in Western and Arab countries. A prospective cross-sectional case-control study, aimed to compare spinal curvatures between postmenopausal women with a recently diagnosed VF and women with osteoporosis with VF, with a new instrument called a curviscope. There was a significant increase in kyphosis angle in women with thoracic or thoracolumbar fracture; however, kyphosis was more common in women with osteoporosis VF than in control subjects. However, this study relied on a small number of subjects, and therefore, it is recommended that the curviscope is tested on a larger sample in order to ensure its sensitivity¹⁴.

Moreover, there are two observational cross-sectional studies supported that the QoL was affected because of Osteoporosis. The first study was investigated in India with the aim of comparing the QoL and bone mass density among normal BMD in post-menopausal women. The result revealed that women with osteoporosis have poor QoL as compared to those with normal BMD²¹. The second study was conducted in Spain for 704 women over the age of 65 years. The study revealed that the QoL of the study group was no worse than the QoL of the general population except for pain, discomfort, anxiety, and depression²².

CONCLUSION

In conclusion, assessing the QoL in postmenopausal women with osteoporosis is crucial for understanding the impact of the disease and guiding treatment strategies. HRQoL questionnaires are commonly used to measure the physical, mental, and social well-being of these individuals. However, generic questionnaires may not capture the specific aspects of osteoporosis that affect QoL, such as fear of falling and uncertainty about the future. Therefore, disease-specific questionnaires may provide a more comprehensive assessment of HRQoL in this population.

Factors that can affect QoL in postmenopausal women with osteoporosis include physical limitations, pain, fear of fractures, and emotional distress. Addressing these factors and providing appropriate interventions can improve QoL and overall outcomes for these individuals.

While there is some evidence on the QoL of postmenopausal women with osteoporosis, more research is needed to further understand the specific aspects that impact QoL and to develop targeted interventions. Future studies should focus on using disease-specific HRQoL questionnaires and exploring the effectiveness of different interventions in improving QoL in this population.

Limitations Of The Search

All 18 articles reviewed were published between 1999-2022. Few

studies were published in other than the English language and were done recently hence could not be included in the search. There are only a few updated studies on the above-said topic. There were no studies conducted in the Arabic countries on this topic to our knowledge.

Additionally, the search may have been limited by the databases and search terms used. Different databases may have different coverage and may not include all relevant articles. The search terms used may also have excluded some relevant studies if they were not included in the keywords or if they used different terminology.

Furthermore, the search may have been biased towards published studies, as unpublished studies or studies in progress may not have been included. This could lead to a potential publication bias, where only studies with significant results are published, while studies with null or non-significant results are not.

Lastly, the search may have missed relevant studies that were not indexed or were not easily accessible. The search may have also missed studies that were published in non-peer-reviewed journals or were not available online.

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Conflict of Interest

The authors declare no conflict of interest regarding the contents of this article.

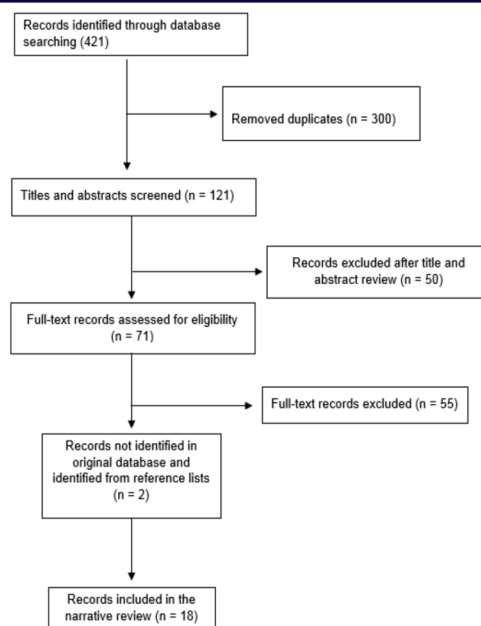


Fig. 1. Flow Diagram Of The Study Selection Process Based On PRISMA²³

Table-1: Data Extraction Tables For Quantitative Studies Of QoL Post-menopausal Women With Osteoporosis From 1999 To 2022

Title: The Burden of prevalent fractures on health-related Quality of life in postmenopausal women with Osteoporosis: the IMOF Study Author/s: Salaffi et al. Year: 2007 Country: Italy Code: 1						
Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To investigate the effect of prevalent vertebral fractures on HRQoL in patients with osteoporosis	A quantitative, cross-sectional multicentre study	234 women with vertebral fractures and 244 asymptomatic women	Three questionnaires were used to collect data (mini OQLQ, SF-36 and EQ-5D)	5 Rheumatology centres in Northern and Central Italy	Postmenopausal women with vertebral fractures had significantly lower scores which means low HRQoL than patients without fractures	Strengths: The use of three data collection tools enhances the rigour of the results. Limitations: The rigour of the study was not addressed
Title: Relationship of Health-Related Quality of Life to Prevalent and New or Worsening Back Pain in Postmenopausal Women with Osteoporosis Author/s: Silverman et al. Year: 2005 Country: USA Code: 2						
Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To examine the association between back pain and HRQoL in postmenopausal women with osteoporosis	Prospective double-blinded, placebo-controlled study	471 postmenopausal ambulatory women with osteoporosis and prior vertebral fracture. Included English-speaking women from Canada, New Zealand, Australia and USA.	HRQoL assessed by OPAQ	Not stated	The decrease in HRQoL seen in people with osteoporosis is conferred by vertebral fractures. Both prevalent and new worsening back pain has a negative impact on HRQoL.	Strengths: Subjects were recruited from different countries and the number was adequate for RCT Limitations: The rigour of the study was not addressed
Title: Relationship of Health-Related Quality of Life to Prevalent and Incident Vertebral Fractures in Postmenopausal Women with Osteoporosis Author/s: Silverman et al. Year: 2001 Country: USA Code: 3						
Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To examine the effect of both prevalent and incident vertebral fractures on health related quality of life in postmenopausal women with osteoporosis	Cross-sectional survey	A total of 1395 postmenopausal women from the 4 English speaking countries participated	HRQoL assessed by OPAQ	Not stated	Both prevalent and incident radiographic vertebral fractures were associated with decreased HRQoL	Strengths: Subjects were recruited from different countries and the number was adequate for cross-sectional study Limitations: The rigour of the study was not addressed

Title: Impact of Osteoporosis and bone fractures on health-related Quality of life in Postmenopausal Women

Author/s: Palacios et al.

Year: 2014

Country: Spain

Code: 4

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To explore the impact of osteoporosis on HRQoL	Cross-sectional survey	A total of 4157 Spanish postmenopausal women were initially diagnosed with osteoporosis according to WHO criteria within the last 2 years	Menopause-specific and generic HRQoL were assessed with the specific Cervantes Scale and the generic SF12 Health Survey.	Outpatient gynaecology clinics	Both prevalent and incident radiographic vertebral fractures were associated with decreased HRQoL	Strengths: Subjects were recruited from different countries and the number was adequate for cross-sectional study Limitations: The rigour of the study was not addressed

Title: Quality of Life among Postmenopausal Women with Osteoporosis in Southern India: A Cross-sectional Study

Author/s: Anupama et al.

Year: 2022

Country: India

Code: 5

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To assess the quality of life among postmenopausal osteoporotic women without fracture and to find out the association of quality of life with selected demographic variables.	Cross-sectional survey	120 postmenopausal osteoporotic women who belong to the age group 45-65 years.	QoL assessed by Short Form-36 (SF-36) quality of life questionnaire	Osteoporosis Clinic of Orthopaedic Outpatient Department of Kasturba Medical College Hospital, Manipal, India,	There was no significant association found between Physical Component Summary (PCS) scores and age (p-value=0.84), religion (p-value=0.94), occupation (p-value=0.805) and BMD (r=-0.058, p-value >0.05). There was no significant association between Mental Component Summary (MCS) scores and age (p-value=0.69), religion (p-value=0.86), occupation (p-value=0.70) and BMD (r-value=-0.0604, p-value >0.05).	Limitations: Small sample size and self-reported data.

Title: Comparison of Quality of Life and Bone Mass Density among Postmenopausal Women: A Cross-sectional Study

Author/s: Singh et al.

Year: 2020

Country: India

Code: 6

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To compare the QoL and bone mass density (BMD) among normal BMD, osteopenic, and osteoporotic postmenopausal women.	A cross-sectional observational study	111 postmenopausal aged 50-79 diagnosed either with osteoporosis, osteopenia or normal BMD were included.	Assessment of QoL was done by pretested and validated QUALEFFO-41 scale.	The outpatient department of physical medicine and rehabilitation at a tertiary care centre of northern India	Significant differences were noted for the mean values of the three domains, i.e., pain, physical, and social function ($P < 0.01$). Women with osteoporosis had significantly higher pain scores as compared to others. Among those with osteoporosis, the pain scores have significantly increased gradually as age increases.	Limitations: Small sample size which lacked in generalisability. The study was cross-sectional in which lacked a control group due to which no causal association can be determined between the predictors and outcome.

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

Author/s: Pastor-Robles et al.

Year: 2022

Country: Spain

Code: 7

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To compare the QoL in women over the age of 65 years diagnosed with osteoporosis with the QoL of the general population, risk factors for osteoporosis-related to QoL were identified.	An observational, descriptive, cross-sectional study with a personal interview.	A random sample of 704 women over the age of 65 were diagnosed with osteoporosis.	Assessment of QoL was done with the EQ-5D.	east Valladolid urban health area	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%)].	Strengths: The use of random samples and large sample sizes from multiple centres in which the results can be generalised. Limitations: Not all the women responded to the survey.

Title: Quality of life in osteoporotic patients with hip fracture and without fracture

Author/s: Cvijetić et al.

Year: 2002

Country: Croatia

Code: 8

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To analyse the quality of life in osteoporotic patients with hip fractures and those without fractures.	An observational, descriptive, cross-sectional study with a personal interview.	The study included postmenopausal women, 35 with hip fractures and 33 without fractures. The control group included 44 age-matched healthy women.	The Osteoporosis Quality of Life Questionnaire was used to assess the health-related quality of life (HRQL).	Not stated	Patients with hip fracture had significantly lower scores in symptoms, physical function, and leisure ($P < 0.05$), than patients without fractures. Both groups of patients had significantly lower scores than controls in all domains except Leisure. Analysing several health and social factors that could influence HRQL	Limitations: The use of a small sample size limited the generalisability of the results.

Title: The Severity of vertebral fractures and health-related quality of Life in osteoporotic postmenopausal women

Author/s: Fechtenbaum et al.

Year: 2005

Country: France

Code: 9

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To assess QOL, using QUALEFFO, in osteoporotic postmenopausal women, according to the number and the severity of the vertebral fractures.	A descriptive, cross-sectional study.	A group of 629 osteoporotic postmenopausal women (60–80 years) with symptoms that, according to a rheumatologist, could be related to a vertebral fracture, had spine X-rays with standardized procedures.	The validated French translation of QUALEFFO was used (41 items), and the evaluation was scored using for each domain a 100-point scale, with 0 representing the best QOL and 100 the worse QOL.	Not stated	The number of fractures was a determinant of a low QOL, as indicated by an increased score in physical function ($P = 0.001$), social function ($P = 0.002$) and total score ($P = 0.027$). Patients with higher grades of vertebral deformities, i.e., more severe fractures, had low QOL in these three domains, too (P	Limitations: The use of a cross-sectional study did not allow to compare the changes of QOL between patients with and without fractures.

Title: Health-related quality of life in Romanian postmenopausal women with osteoporosis and fragility fractures

Author/s: Ciubean et al.

Year: 2018

Country: Romania

Code: 10

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To evaluate the burden of osteoporosis and fragility fractures in Romanian postmenopausal women from Cluj County using the 36-Item Short Form Health Survey (SF-36) and Quality of life questionnaire of the European Foundation for Osteoporosis (QUALEFFO-41) questionnaires.	A descriptive, cross-sectional study.	The study included a total of 364 postmenopausal women, of whom 228 women had been previously diagnosed with primary osteoporosis. The rest of 136 women were healthy age-matched controls	All patients included in the study were asked to complete the Romanian version of the SF-36. Furthermore, women diagnosed with osteoporosis were asked to complete the Romanian version of QUALEFFO-41.	Clinical Rehabilitation Hospital in Cluj-Napoca, Romania.	Women with osteoporosis had significantly lower scores in the SF-36 domains ($P, 0.001$) than healthy controls. In the osteoporosis group, a significant association was found in the SF-36 pain domain, where women with a history of fracture had higher scores ($P = 0.035$). As for QUALEFFO-41, a statistical significance was found in the total score ($P, 0.05$), revealing a significantly lower QoL in osteoporotic women with a history of fracture.	Limitations: The low number of subjects who were recruited from one clinical setting limit the generalisability of the results to another context.

Title: Health-Related Quality of Life in Postmenopausal Women with Low BMD With or Without Prevalent Vertebral Fractures

Author/s: Oleksiak et al.

Year: 2000

Country: UK

Code: 11

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
HRQOL was assessed in 751 osteoporotic (bone mineral density [BMD]T score > 22.5)	A cross-sectional epidemiological study	751 osteoporotic (bone mineral density [BMD]T score > 22.5) women from	Three types of HRQOL questionnaires were used: a general health assessment (NHP), a preference-based	European countries	In comparison with patients without VFX, those with VFX were older (66.265.9 years vs. 68.866.3 years ; $p < 0.001$), had a higher prevalence of nonvertebral fractures (25% vs. 36%; $p > 0.002$), and had higher QUALEFFO scores	Strengths: subjects were recruited from multiple European countries, and this enhances the generalisability of the results.

women from Europe with or without vertebral fractures (VFX).		Europe with or without vertebral fractures (VFX).	instrument (EQ-5D [formerly named the EuroQol]), and a disease-targeted instrument (QUALEFFO).		progressively with increasing number of VFX, especially lumbar fractures ($p<0.001$). Patients with a single VFX already had a significant increase in QUALEFFO scores ($p<0.05$).	
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Title: Spinal Curvatures and Quality of Life in Women with Vertebral Fractures Secondary to Osteoporosis

Author/s: Cortet et al.

Year: 1999

Country: UK

Code: 12

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To compare spinal curvatures in women with osteoporosis and control subjects with a new instrument, the curviscope.	A prospective cross-sectional case-control study.	Ninety-eight postmenopausal women were evaluated. They were divided into two groups, according to their bone status: women with osteoporosis with at least one vertebral fracture ($n = 51$) and control subjects ($n = 47$).	Quality of life was assessed by using a generic instrument, the Nottingham Health Profile, in patients with osteoporosis only.	Not stated	The reproducibility of the curviscope was satisfactory. For kyphosis measurements, the coefficients of variation were 2.8% and 2.4% in control subjects and women with osteoporosis, respectively. Kyphosis values were significantly higher in women with osteoporosis than in age-matched control subjects ($63^\circ \pm 13^\circ$ vs. $52^\circ \pm 11^\circ$, respectively; $P < 0.005$). Nottingham Health Profile scores were significantly different ($P < 0.05$) in women with osteoporosis with a recently diagnosed vertebral fracture, compared with other women with osteoporosis in two aspects, physical mobility, and energy.	Limitations: A small sample size might limit the generalisability of the results.

Title: Strontium ranelate Prevents the Quality of life impairment in post-menopausal Women with established vertebral osteoporosis

Author/s: Marquis et al.

Year: 2008

Country: Multicentre study (European countries)

Code: 13

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To demonstrate the effect of orally administered strontium ranelate versus placebo on the incidence of new vertebral fractures and compared impact on quality of life (QoL).	Multicentre, placebo-controlled, randomised, double-blind phase III trial in the following countries: Australia, Belgium, Denmark, France, Germany, Greece, Hungary, Italy, Poland, Spain, Switzerland, and the UK.	A total of 1,240 women were included (strontium ranelate: $n=618$ and placebo: $n=622$).	QoL was assessed 6 months over 3 years using the QUALIOST® and SF-36® questionnaires in postmenopausal osteoporotic women with prevalent fractures taking strontium ranelate or placebo 2 g/day	Multicentre study	The QUALIOST® total score decreased in the strontium ranelate group, indicating preserved QoL compared with a deterioration in the placebo group ($P=0.016$). Strontium ranelate patients had reduced QUALIOST® emotional and physical dimension scores ($P=0.019$ and 0.032 , respectively, versus placebo), indicating beneficial effects on emotional and physical functioning.	Strengths: The use of multicentre double-blind randomised controlled trials is the highest level of evidence-based research in which the results can be generalised to other populations with similar characteristics. Limitations: The key limitation commonly associated with the evaluation of QoL in clinical studies is a failure to account for missing data.

Title: The ECOS-16 questionnaire for the evaluation of health-related quality of life in postmenopausal women with osteoporosis

Author/s: Badia et al.

Year: 2004

Country: Spain

Code: 14

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To validate the questionnaire ECOS-16 (Assessment of health-related quality of life in osteoporosis) for the evaluation of health-related quality of life (HRQoL) in post-menopausal	An observational, prospective, and multicentre study	316 women were consecutively included, 212 from primary care centres and 104 from hospital outpatient clinics.	In all visits, ECOS-16, EUROQoL-5D (EQ5D) and four 7-point items about health status (general health status, back pain, limitation in daily activities and emotional status) were administered, whereas only outpatients were given MINI-OQLQ (Mini Osteoporosis	Multicentre study 212 patients were recruited from 49 Primary Care Centres and 104 patients who attended in	HRQoL. Moderate to high correlations were found between the ECOS-16 score and the other health status questionnaires (0.47–0.82). Reliability: internal consistency (Cronbach's α) was 0.92 and test-retest reliability (ICC) was 0.80. Responsiveness to change: ECOS16 scores increased	Strengths: The use of multicentre and large sample size enhances generalisability.

women with osteoporosis.			Quality of Life Questionnaire), besides all clinical variables; and sociodemographic variables at baseline	outpatient clinics from 14 hospitals were consecutively selected and eval	according to change perceived by the patient, as well as the effect size (ranges between 1.35 to 0.43), the greater the perception of change in patients' general health status, the greater the changes in patients' scores.	
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Title: Quality of life in women with postmenopausal osteoporosis: Correlation between QUALEFFO 41 and SF-36

Author/s: de Oliveira Ferreira et al.

Year: 2009

Country: Brazil

Code: 15

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To evaluate the quality of life (QoL) in women with postmenopausal osteoporosis, correlating the QUALEFFO 41 with the short-form health survey 36 (SF-36) and evaluated some factors that can influenced the QoL of women with osteoporosis.	A cross-sectional study	Total 220 postmenopausal women (ages ranging from 55 to 80 years). Of the total number, 110 women had osteoporosis and 110 women did not have osteoporosis and these women were age-matched (± 3 years).	Two questionnaires were administered to all subjects for evaluation of QoL: the quality-of-life questionnaire of the European foundation for Osteoporosis 41 (QUALEFFO 41) and the short-form health survey 36 (SF-36).	Menopause Outpatient Facility in the Women's Integral Healthcare Centre (CAISM) and Osteoporosis Outpatient Facility of the Hospital das Clínicas (HC), both in the State University of Campinas (Unicamp), São Paulo, Brazil.	Women with osteoporosis had a worse QoL both in the QUALEFFO 41 and in the SF-36, in all domains studied. Data was adjusted for BMI, race, school education and use of HT ($p < 0.001$). There was a significant correlation between all domains in the QUALEFFO 41 questionnaire and their corresponding domains in the SF-36 ($p < 0.001$).	Limitations: One of the limitations of the present study refers to the type of design used. Since this is a cross-sectional study, it evaluates the association between variables without considering their chronological order.

Title: Quality of life in ambulatory postmenopausal women: the impact of reduced bone mineral density and subclinical vertebral fractures

Author/s: Romagnoli et al.

Year: 2004

Country: Italy

Code: 16

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To investigate the QOL perception in 361 asymptomatic ambulant postmenopausal women who came to our centre for an osteoporosis screening program planned with their general practitioners	A cross-sectional study	361 asymptomatic ambulant postmenopausal women	The Quality-of-Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO) was administered to all subjects.	Mineral Metabolism Centre	When we segregated both osteopenic and osteoporotic women according to whether or not they had vertebral fractures, a significant difference was found only in osteoporotic patients for domains that explore physical function.	Limitations: One of the limitations of the present study refers to the type of design used. Since this is a cross-sectional study, it evaluates the association between variables without considering their chronological order.

Title: Bone Mineral Density and Health-Related Quality of Life: a 3-Year Follow-Up Study of Osteoporotic Postmenopausal Women

Author/s: Bruyere et al.

Year: 2009

Country: Belgium

Code: 17

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To evaluate the relationship between change in bone mineral density (BMD) and change in health-related quality of life (HRQoL) over a 3-year period, in patients without incident of osteoporotic fracture	Placebo data from two randomized, double-blind, placebo-control trials were used to assess the effect and safety of a new anti-osteoporotic drug	1838 osteoporotic postmenopausal women aged over 50 years, 967 had no fractures and the remaining had vertebral fractures	(432) women received both the SF-36 and QUALIOST questionnaires	Not stated	Multivariate regression analysis showed a significant association between the lumbar BMD and the mental component of the SF-36 ($p < 0.001$). However, the relationship was not significant with the global score of the QUALIOST ($p = 0.098$) and the physical component of the SF-36 ($p = 0.051$). Multivariate regressions did not show a significant relationship between HRQoL and proximal femur BMD at baseline. After 3 years of follow-up, multivariate regression analysis showed no significant association between change in lumbar BMD and the main HRQoL items (global score of the QUALIOST, physical and mental components of the SF-36; p between 0.437 and 0.942).	Strengths: One of the strengths is the inclusion of a large number of participants which enhances the generalisability of the results. Limitations: Despite the large sample recruited only a small fraction of the patients (432) received both the SF-36 and QUALIOST questionnaires.

Title: The impact of incident vertebral and non-vertebral fractures on health-related quality of life in postmenopausal women

Author/s: Adachi et al.

Year: 2002

Country: Canada

Code: 18

Aim/s	Design	Sample	Method	Setting	Key Findings/Themes	Strengths and Limitations
To examine the relationship between HRQL and the incidence of fractures in postmenopausal women.	Prospective correlational study.	A total of 2009 postmenopausal women 50 years and older who were seen in consultation at our tertiary care, university teaching hospital-affiliated office and who were registered in the Canadian Database of Osteoporosis and Osteopenia (CANDOO) patients.	The disease-targeted mini-Osteoporosis Quality of Life Questionnaire (mini OQLQ) was used to measure HRQL.	Tertiary care, university teaching hospital-affiliated office.	Multiple regression analyses revealed that subjects who had experienced an incident vertebral fracture had lower HRQL difference scores as compared with non-fractured participants in total score (- 0.86; 95% confidence intervals (CI): -1.30, -0.43) and the symptoms (-0.76; 95% CI: -1.23, -0.30), physical functioning (-1.12; 95% CI: -1.57, -0.67), emotional functioning (-1.06; 95% CI: -1.44, -0.68), activities of daily living (-1.47; 95% CI: -1.97, -0.96), and leisure (-0.92; 95% CI: -1.37, -0.47) domains of the mini OQLQ.	Strengths: One of the strengths is the inclusion of a large number of participants which enhances the generalisability of the results.

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