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Health-Related Quality of Life in Patients Living with Osteosarcoma in Europe: A Systematic Literature Review

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INTRODUCTION

- Osteosarcoma is the most common primary malignant bone tumor, originating from mesenchymal cells and characterized by uncontrolled bone formation. It primarily affects adolescents and young adults, accounting for ~20% of all primary bone sarcomas[1,2]
- Survivors often face challenges with body image, mobility, emotional health, and late effects that extend into adulthood. Evaluating health-related quality of life (HRQoL) is therefore essential to fully capture the burden of both disease and survivorship, beyond traditional clinical endpoints[3,4]
- Validated instruments provide valuable insight into patient experiences that can be used to tailor patient-centered healthcare decision-making

OBJECTIVES

- This systematic literature review (SLR) aimed to comprehensively identify evidence on quality of life (QoL) for patients with osteosarcoma in Europe

METHODS

- Embase® and Medline® were systematically searched via Embase.com, following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, for English-language studies reporting QoL outcomes in children and adults with osteosarcoma in Europe
- Two independent reviewers screened title and abstracts, with full-text assessments performed by the same reviewers and reconciled by a third independent reviewer if needed
- The inclusion criteria for the SLR are presented in Table 1

Table 1: Inclusion criteria

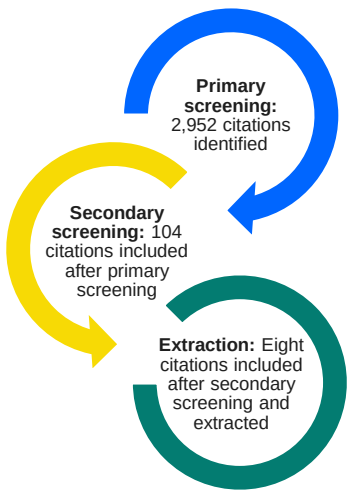
Population	Patients with osteosarcoma
Intervention and comparator	No restriction
Outcomes	▪ HRQoL/PROs: EQ-5D, EORTC QLQ-C30, FACT-Lym, disease-related PROs ▪ Health-state utilities: Disease-related utilities and generic utilities
Study designs	Observational studies
Country	European countries
Language	English
Timeframe	No time limitations

Key: EORTC QLQ-30, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30; FACT-Lym, Functional Assessment of Cancer Therapy – Lymphoma; HRQoL, health-related quality of life; PROs, patient-reported outcomes.

RESULTS

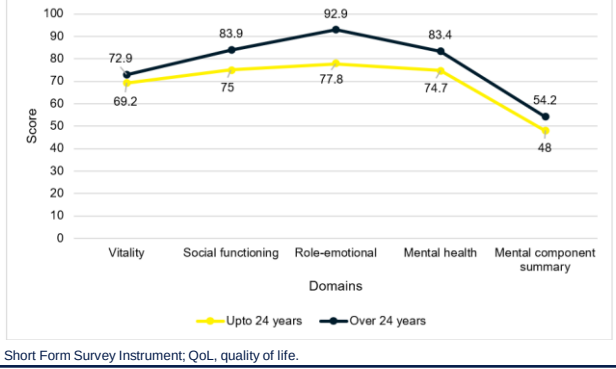
- A total of 2,952 records were screened using the predefined population, intervention, comparison, outcomes, and study (PICOS)-based criteria. Eight studies were identified and included that evaluated the HRQoL of osteosarcoma, across six countries (Figure 1)
- Among the included studies, three were conducted in the Netherlands, and one each was conducted in Germany, Italy, Switzerland, Turkey, and the UK

Figure 1: Flow of citations across different phases of the review



- Among knee-surgery survivors, QoL remained stable over time, with no significant changes in Physical Component Summary (PCS; 42.3 versus 39.2; p = 0.41) or Mental Component Summary (MCS; 56.6 versus 57.5; p = 0.74) between 2-year and long-term follow-up[5]
- QoL assessment with the SF-36 showed marked impairment in physical domains, including physical functioning, physical role functioning, and vitality, with pain and general health moderately affected in patients with osteosarcoma. In contrast, social functioning and mental health were relatively preserved, although the role-emotional scores were lower. The low PCS (20.4) compared with a higher MCS (45.7) suggest that physical limitations have a greater impact on QoL than psychological domain[6]
- Overall, survivors of the lower extremity osteosarcoma demonstrated impaired physical health (PCS: 35.3) but maintained good mental wellbeing (MCS: 55.8)[7]
- Patients over 24 years who underwent childhood rotationplasty demonstrated significantly higher MCS scores than those aged up to 24 years (54.2 versus 48.0; p = 0.04), alongside better vitality, social functioning, emotional role functioning, and mental health outcomes (Figure 2)[8]

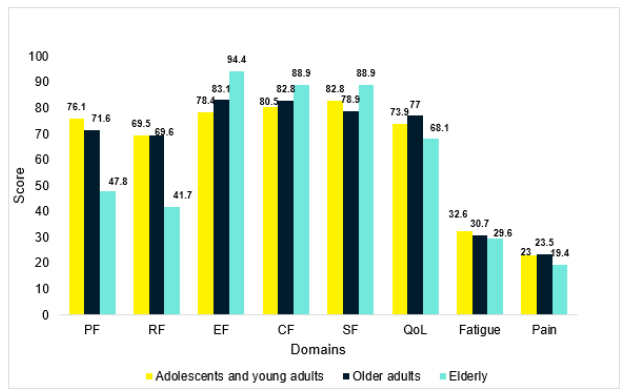
Figure 2: SF-36 scores by age group



Key: SF-36, 36-Item Short Form Survey Instrument; QoL, quality of life.

- Among osteosarcoma survivors, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30 (EORTC QLQ-C30) scores demonstrated an age-related decline in physical functioning (76.1 to 47.8) and role functioning (69.5 to 41.7), whereas emotional functioning showed improvement from 78.4 to 94.4 (Figure 4)[9]
- In a multivariable regression analysis, patients demonstrated significantly poorer outcomes across several domains of the EORTC QLQ-C30, highlighting functional impairment (physical, role, social, and emotional) alongside a significant symptom burden (pain and fatigue)[10]

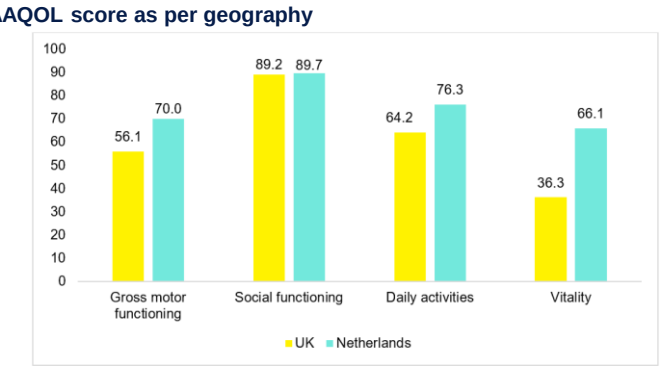
Figure 4: EORTC-QLQ-C30 scores by age group



Key: CF, cognitive functioning; EF, emotional functioning; PF, physical functioning; QoL, quality of life RF, role functioning; SF, social functioning.

- TNO-AZL Questionnaire for Adult's Quality of Life.(TAAQOL) scores remained stable between 2-year and long-term follow-up, with PCS of 43.8 versus 42.3 (p = 0.68) and MCS of 52.3 versus 50.6 (p = 0.47), indicating no significant changes over time[5]
- Mean TAAQOL domain scores varied from 36.3 to 89.2 in the UK and from 66.1 to 89.7 in the Netherlands, as shown in Figure 5[6]

Figure 5: TAAQOL score as per geography



Key: TAAQOL, TNO-AZL Questionnaire for Adult's Quality of Life.

CONCLUSIONS

- Survivors of osteosarcoma of the lower extremity often experience physical limitations and pain-related challenges, though their psychological and social well-being generally remain stable
- Notably, older patients, particularly those with childhood rotationplasty, show better emotional functioning and social participation compared with adolescents and young adults
- While many survivors adapt well emotionally and socially, persistent physical symptoms highlight the importance of long-term follow-up, rehabilitation and regular HRQoL assessments

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