

Background: Neck pain is a common health condition that generates high levels of disability, consumption of healthcare services, and lost productivity. Cost-of-illness studies can provide insights into the economic impact of a specific illness, which informs policy makers and justifies intervention programs. However, there is a lack of literature summarizing the economic burden of neck pain.

Objectives: To conduct a systematic review to summarize the healthcare costs related to neck pain.

Methods: The search was conducted in seven databases (PubMed, EMBASE, CINAHL, SPORTDISCUS, EconLit, National Health Service Economic Evaluation Database, and Health Technology Assessment Database) on 18 December 2024. Cross-sectional and cohort studies that measured the healthcare costs related to neck pain, regardless of the duration of symptoms, in adults over 18 years old of both sexes were included. Healthcare costs included prescribed medication and healthcare services consumed by patients. All costs were inflated for the same reference year (2023) using the Consumer Price Index of each country and converted to International Dollar (\$). The results were presented descriptively.

Results: Four studies were included for data extraction. None of the studies reported onset or duration of neck pain symptoms. Two studies provided relevant information on the description of the components of healthcare costs of neck pain, being the costs of hospitalization and procedures the most cited. In The Netherlands (high-income country), the total healthcare costs were \$291,901,827 in a 12-month period. Separately, hospital care costs were \$31,702,814 (10.9%), medical procedures were \$3,969,432 (1.3%), medical specialist fees were \$2,901,739 (1%), ambulatory hospital care were \$1,328,099 (0.5%), general practice were \$7,973,887 (2.7%), and paramedical care costs were \$244,025,856 (83.6%). In Brazil (upper-middle-high income country), the total healthcare costs were \$6,090,870 in a 12-month period. Separately, hospital costs were \$3,730,247 (61.2%), professional costs were \$625,037 (10.3%), intensive care unit costs were \$397,926 (6.5%), companion stay costs were \$17,550 (0.3%), and outpatient costs were \$1,320,110 (21.7%). Two studies were conducted in the United States (high-income country). One study found that early physiotherapy initiation resulted in lower one-year costs per patient (\$2,438) compared to late initiation (\$5,299, $p < 0.001$), while the other study showed that total healthcare costs were \$439,681,567 in a 12-month period per patient.

Conclusion: The total healthcare costs of neck pain ranged from \$6,090,870 to \$439,681,567. Since three studies included in this systematic review were from high-income countries, further studies are needed to better estimate the healthcare costs of neck pain worldwide. Additionally, prospective cohort studies are needed to provide a more accurate assessment of the healthcare costs of neck pain and to inform and support clinical decision-making, considering a standardization of the cost estimation and reporting methods, as well as a clear definition of neck pain.

Implications: This review highlights a large variation in the healthcare costs of neck pain, which emphasizes the need to standardize cost estimation and reporting for better comparability and decision-making. Despite this, early physiotherapy initiation, compared to late, reduces costs. Policymakers can use these data to promote early physiotherapy referral and prioritize conservative treatments.

Keywords: neck pain, cost of illness, economic evaluation

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THE INFLUENCE OF PSYCHOLOGICAL FACTORS ON SHOULDER RANGE OF MOTION IN INDIVIDUALS WITH SHOULDER PAIN

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Background: Shoulder dysfunctions are among the leading causes of musculoskeletal pain, often associated with a reduced range of motion and subsequent functional impairments. Emerging evidence suggests that psychological issues, such as kinesiophobia, pain catastrophizing, and increased central sensitivity, might play a role in pain perception and shoulder functional performance. Additionally, the reduced range of motion has been significantly associated with pain severity and physical disability in these patients. However, the relationship between psychological issues and shoulder range of motion remains unclear.

Objectives: This secondary analysis aimed to investigate whether the reduced shoulder range of motion is associated with negative psychological factors in individuals with musculoskeletal shoulder pain.

Methods: A total of 159 individuals (68 females, 39 ? 12.5 years old) with musculoskeletal shoulder pain (44.5 ? 55.9 months of pain) were assessed. Sociodemographic data and pain intensity (Numerical Pain Rating Scale, NPRS, 0–10) were recorded based on self-report. Shoulder range of motion for external rotation and abduction (degrees) were measured using inclinometry (Acumar, Model ACU 360, Lafayette Instrument Company). Kinesiophobia (Tampa Scale for Kinesiophobia, TSK), pain catastrophizing (Pain Catastrophizing Scale, PCS), and central sensitivity (Central Sensitization Inventory, CSI) were the psychological factors assessed using specific Patient Reported Outcome Measures. Two multiple linear regression analyses were performed to investigate the association between each shoulder range of motion (dependent variables) and psychological factors (independent variables). The models were adjusted using the ordinary least squares regression method, with statistical significance threshold set at $p < 0.05$. The assumptions of linear regression were verified, including normality of residuals, homoscedasticity, and absence of multicollinearity.

Results: For external rotation range of motion, the model indicated that psychological factors explained 5.1% of the variation in range of motion ($R = 0.226$; $R^2 = 0.051$, $p = 0.043$). Central sensitivity's ($\beta = -0.19$; $p = 0.02$) contribution was significant for the model, while kinesiophobia ($\beta = -0.09$; $p = 0.25$), and catastrophizing ($\beta = 0.02$; $p = 0.77$) were not able to explain external range of motion. Conversely, for abduction range of motion, psychological predictors accounted for only 0.9% of the variation ($R = 0.096$, $R^2 = 0.009$, $p = 0.699$), with no contribution of any of the psychological predictors.

Conclusion: Kinesiophobia, pain catastrophizing, and central sensitivity might explain the decrease in range of motion of shoulder external rotation; however, they did not affect shoulder abduction. However, individuals with higher signs of central sensitivity are more likely to present lower external rotation range of motion. Therefore, other factors may be involved in shoulder range of motion limitations and might be better investigated.

Implications: These findings underscore the role of psychological factors in restricting shoulder external rotation, highlighting the need for therapeutic approaches that integrate both psychological and biomechanical aspects in the management of musculoskeletal shoulder pain.

Keywords: Shoulder pain, Range of motion, Psychological factors