



(REVIEW ARTICLE)



## Cultural variability in pain perception: A review of cross-cultural studies

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International Journal of Science and Research Archive, 2024, 11(01), 2550–2556

Publication history: Received on 14 January 2024; revised on 25 February 2024; accepted on 27 February 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.11.1.0339>

### Abstract

Pain perception is a complex phenomenon influenced by biological, psychological, and socio-cultural factors. This review presents a review of cross-cultural studies investigating the cultural variability in pain perception. Understanding how different cultures experience and express pain is crucial for providing effective healthcare interventions and improving patient outcomes. Cross-cultural research reveals significant variations in pain perception across different cultural groups. Cultural beliefs, values, and practices shape individuals' interpretation and expression of pain. Studies have shown that cultural norms dictate whether individuals express pain openly or suppress it, impacting their willingness to seek medical help and their response to pain management strategies. Furthermore, cultural differences in pain expression extend to non-verbal cues and pain-related behaviors. For instance, some cultures may perceive stoicism as a virtue, leading individuals to underreport their pain levels, while others may encourage vocal expressions of pain. These cultural nuances influence healthcare professionals' interpretation of patients' pain experiences and may lead to disparities in pain assessment and treatment. Moreover, cultural factors interact with biological mechanisms to modulate pain perception. Genetic predispositions and physiological differences contribute to variations in pain sensitivity among different ethnic groups. However, cultural factors such as coping mechanisms, social support networks, and cultural rituals also play a significant role in shaping individuals' pain experiences. The impact of culture on pain perception extends beyond individual differences to influence healthcare systems and policies. Cultural competency training for healthcare providers is essential to address disparities in pain management and ensure culturally sensitive care. Additionally, integrating cultural factors into pain assessment tools and treatment protocols can improve the accuracy of pain assessment and enhance patient care outcomes. Cultural variability significantly influences pain perception, expression, and management. Cross-cultural studies provide valuable insights into the complex interplay between culture, biology, and socio-cultural factors in shaping individuals' experiences of pain. Recognizing and addressing cultural differences in pain perception is essential for delivering equitable and effective healthcare services worldwide.

**Keywords:** Culture; Pain; Perception; Studies; Cross-Cultural; Review

### 1. Introduction

Pain perception, a multidimensional construct, encompasses the sensory, emotional, and cognitive processes involved in experiencing pain (Coninx, 2022). It is not merely a physiological response but also influenced by psychological, social, and cultural factors. Pain perception varies widely among individuals and is subject to cultural interpretation and expression (Sharma *et al.*, 2020).

Pain perception refers to the intricate process through which an individual recognizes and interprets sensory signals indicating tissue damage or potential harm to the body (Kaliyaperumal *et al.*, 2020). It involves the transmission of

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nociceptive signals through the nervous system and the brain's processing of these signals to generate the subjective experience of pain. However, pain perception extends beyond the physiological experience to encompass emotional and cognitive components, shaping how individuals interpret, express, and cope with pain (Craig and MacKenzie, 2021).

Cultural variability significantly influences how individuals perceive, express, and respond to pain. Culture encompasses shared beliefs, values, norms, and practices that shape individuals' behaviors and attitudes towards pain (Ridgeway and Markus, 2022). Cultural factors such as language, religion, social norms, and traditional healing practices profoundly impact how pain is experienced and communicated within a particular cultural context (Crockett *et al.*, 2021). Understanding cultural variability in pain perception is essential for healthcare providers to deliver effective and culturally sensitive care (Rogger *et al.*, 2023). Failure to recognize and address cultural differences in pain perception can lead to disparities in pain management, diagnostic accuracy, and treatment outcomes (Knoebel *et al.*, 2021). Therefore, exploring how culture shapes pain perception is critical for improving healthcare delivery and promoting equitable access to pain relief services.

This review aims to examine the existing literature on cultural variability in pain perception, focusing on cross-cultural studies conducted across diverse populations. By synthesizing findings from these studies, the review seeks to explore how cultural beliefs, values, and norms influence the perception and expression of pain. Investigate cultural differences in pain sensitivity and pain-related behaviors. Examine the interaction between cultural and biological factors in shaping pain perception. Discuss the implications of cultural variability in pain perception for healthcare practice, including pain assessment, management, and patient-provider communication. Identify gaps in the current research and propose directions for future studies to advance our understanding of cultural influences on pain perception.

In summary, this review provides a comprehensive overview of the role of culture in shaping pain perception, highlighting its significance for healthcare practice and outlining avenues for future research.

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## 2. Cultural Influences on Pain Perception

Cultural beliefs and values profoundly shape individuals' perceptions and experiences of pain (Mathur *et al.*, 2020). These beliefs may include interpretations of the causes and meanings of pain, as well as attitudes towards pain expression and coping mechanisms. For example, some cultures may view pain as a natural part of life or as a test of endurance, while others may associate pain with spiritual or moral concepts such as punishment or sin (Paley *et al.*, 2023). Additionally, cultural beliefs about the efficacy of various pain management strategies, including traditional remedies or spiritual interventions, can influence individuals' preferences for treatment approaches (Reis *et al.*, 2022).

Cultural norms dictate how individuals are expected to express pain within a given cultural context. Some cultures may encourage stoicism and discourage overt displays of pain, viewing endurance as a virtue (Langlands, 2021). In contrast, other cultures may value the open expression of pain as a means of seeking social support or demonstrating vulnerability. These cultural norms influence individuals' willingness to report pain, seek medical attention, and engage with healthcare providers (Granström *et al.*, 2020). Moreover, cultural differences in pain expression can impact healthcare professionals' perceptions of patients' pain experiences and may contribute to disparities in pain assessment and treatment (Mathur *et al.*, 2022).

Cultural practices, rituals, and customs can also influence individuals' experiences of pain (Mathur *et al.*, 2020). For example, cultural ceremonies or rituals may provide social support networks and coping mechanisms for individuals experiencing pain. Traditional healing practices, such as acupuncture or herbal medicine, may be deeply rooted in cultural beliefs and play a significant role in shaping individuals' perceptions of pain and illness (Alzahrani *et al.*, 2024). Furthermore, cultural factors such as diet, lifestyle, and environmental influences can contribute to variations in pain sensitivity and the prevalence of pain-related conditions across different cultural groups.

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## 3. Findings from Cross-Cultural Studies

Cross-cultural studies have consistently demonstrated variations in how pain is expressed and communicated across different cultural groups (Shirazi *et al.*, 2020). These variations may include differences in verbal expressions of pain, non-verbal cues such as facial expressions or body language, and cultural-specific ways of describing pain sensations. Understanding these variations is essential for healthcare providers to accurately assess and manage pain in culturally diverse patient populations (Almoallim *et al.*, 2021).

Research has shown that cultural factors contribute to differences in pain sensitivity and tolerance among various ethnic and cultural groups (Losin *et al.*, 2020; Rogger *et al.*, 2023). These differences may be influenced by genetic predispositions, cultural attitudes towards pain, and environmental factors such as diet, lifestyle, and exposure to trauma or stress. Recognizing these differences is crucial for developing culturally sensitive pain management strategies and ensuring equitable access to pain relief services (Wallace *et al.*, 2021).

Cultural factors shape individuals' behaviors and responses to pain, including their willingness to seek medical help, adherence to treatment regimens, and engagement with pain management interventions (Driscoll *et al.*, 2021). Cultural beliefs about pain causation, treatment efficacy, and the role of healthcare providers can significantly impact individuals' pain-related behaviors. Therefore, addressing cultural factors is essential for promoting patient-centered care and improving healthcare outcomes in culturally diverse populations (Wasim *et al.*, 2023).

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#### 4. Interaction of Cultural and Biological Factors

Genetic factors play a significant role in determining an individual's susceptibility to pain and their response to pain stimuli (Sessle, 2021). Studies have identified genetic variations associated with pain sensitivity, tolerance, and perception. However, the expression of these genetic predispositions can be modulated by cultural factors. For example, research suggests that certain genetic polymorphisms may be more prevalent in specific ethnic or cultural groups, leading to differences in pain sensitivity among populations (Cong *et al.*, 2020; Chadwick *et al.*, 2021). Moreover, cultural practices such as dietary habits, lifestyle choices, and traditional healing modalities can influence gene expression and contribute to variations in pain sensitivity across cultures (Wang, 2023).

Neurobiological research has elucidated the neural pathways and mechanisms involved in pain perception and modulation (Tan and Kuner, 2021). Cultural influences can modulate these neurobiological processes through various means, including cognitive appraisal, emotional regulation, and social conditioning (Abraham and Feldman, 2022). For instance, cultural beliefs and expectations can shape individuals' cognitive appraisal of pain, influencing how they perceive and interpret painful stimuli. Additionally, cultural norms surrounding emotional expression and social support can impact the activation of brain regions involved in pain processing, such as the amygdala and prefrontal cortex. Understanding the neurobiological underpinnings of cultural influences on pain perception is crucial for developing targeted interventions to address cultural disparities in pain management (Clarke *et al.*, 2022).

Socio-cultural factors such as socioeconomic status, education level, and social support networks can modulate individuals' biological responses to pain (Kerr *et al.*, 2020). For example, individuals from marginalized or disadvantaged social groups may experience increased stress, trauma, and environmental hazards, leading to heightened pain sensitivity and chronic pain conditions. Moreover, cultural beliefs and attitudes towards pain may influence coping strategies, adherence to treatment regimens, and healthcare-seeking behaviors (Huysmans *et al.*, 2020). Therefore, addressing socio-cultural determinants of health is essential for mitigating disparities in pain outcomes and improving access to equitable pain care.

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#### 5. Implications for Healthcare Practice

Cultural variability significantly impacts the assessment and management of pain in healthcare settings. Healthcare providers must recognize and understand how cultural beliefs, values, and practices influence patients' pain experiences and expressions (Adekanmbi and Wolf, 2024). Failure to consider cultural factors in pain assessment may lead to misinterpretation of patients' pain reports, resulting in underdiagnosis, undertreatment, or inappropriate treatment interventions. Therefore, healthcare providers must employ culturally sensitive assessment tools and communication strategies to ensure accurate pain assessment and personalized pain management plans for culturally diverse patient populations (Onoyere and Adekanmbi, 2012; Pringle *et al.*, 2021).

Cultural competency refers to healthcare providers' ability to understand, respect, and effectively communicate with patients from diverse cultural backgrounds (Botelho and Lima, 2020.). Culturally competent care entails acknowledging and addressing cultural factors that influence patients' health beliefs, behaviors, and treatment preferences (Young and Guo, 2020.). In the context of pain management, cultural competency is essential for establishing trust and rapport with patients, facilitating open communication, and tailoring treatment approaches to individual cultural needs and preferences. Healthcare organizations should prioritize cultural competency training for staff members and implement policies and practices that promote culturally responsive care (Fabian *et al.*, 2023).

To address cultural disparities in pain care, healthcare providers can implement various strategies for integrating cultural factors into pain management protocols (Uchechukwu *et al.*, 2024). Conducting culturally sensitive pain assessments that consider patients' cultural backgrounds, beliefs, and values. Providing culturally relevant information about pain, treatment options, and self-management strategies to empower patients in their care (Agarwal, 2020). Collaborating with culturally diverse healthcare professionals, including interpreters, cultural liaisons, and traditional healers, to provide comprehensive pain care (Aranda *et al.*, 2021). Engaging with community organizations, religious institutions, and cultural centers to raise awareness about pain management and promote health literacy within culturally diverse communities. Supporting research initiatives that explore the intersection of culture and pain perception and develop culturally tailored interventions to address disparities in pain care (Adeleke *et al.*, 2019).

By incorporating cultural considerations into pain management protocols, healthcare providers can enhance the quality of care, improve patient satisfaction, and promote health equity for all individuals experiencing pain (Ilugbusi *et al.*, 2020; Kim *et al.*, 2021).

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## 6. Future Directions and Recommendations

While existing research has provided valuable insights into the cultural variability of pain perception, there remains a need for more in-depth studies focusing on specific cultural groups and subpopulations (Haque and Malebranche, 2020; Vincent *et al.*, 2021). By examining the unique cultural beliefs, values, and practices within different communities, researchers can gain a more nuanced understanding of how cultural factors influence pain perception and management. This targeted research can help identify cultural-specific barriers to effective pain care and inform the development of tailored interventions to address disparities in pain outcomes (Bernardes *et al.*, 2022).

To accurately assess pain in culturally diverse populations, there is a need for the development and validation of culturally sensitive pain assessment tools (Abrahams *et al.*, 2023). These tools should take into account cultural variations in pain expression, communication styles, and interpretation of pain severity. Incorporating culturally relevant language, imagery, and response options can improve the validity and reliability of pain assessments across different cultural contexts (Adaga *et al.*, 2024). Moreover, involving members of diverse cultural communities in the design and validation process can enhance the cultural appropriateness and acceptability of these assessment tools.

Education and training initiatives aimed at enhancing healthcare professionals' cultural competency in pain management are essential for improving patient care outcomes (Hunter *et al.*, 2021). Healthcare providers should receive training on cultural humility, communication skills, and cultural awareness to better understand and address patients' cultural needs and preferences. Continuing education programs should include modules on cultural competence in pain assessment, management, and patient-provider communication (Abrahams *et al.*, 2023). Moreover, healthcare organizations should prioritize diversity, equity, and inclusion initiatives to foster a culturally competent workforce and create a supportive environment for delivering culturally responsive care (White *et al.*, 2022).

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## 7. Recommendations and Conclusion

The review highlights the complex interplay between cultural and biological factors in shaping individuals' experiences of pain. Cultural beliefs, values, and practices influence how pain is perceived, expressed, and managed across diverse cultural groups. Moreover, cultural variability significantly impacts pain assessment, treatment outcomes, and healthcare disparities. Understanding and addressing cultural factors are essential for delivering equitable and effective pain care.

Recognizing and addressing cultural variability in pain perception is critical for improving healthcare outcomes and promoting health equity. By acknowledging the cultural diversity of patients' pain experiences and tailoring interventions to meet their cultural needs, healthcare providers can enhance patient satisfaction, adherence to treatment, and overall quality of care. Culturally competent care not only improves individual patient outcomes but also contributes to the broader goal of reducing health disparities and advancing health equity.

By integrating cultural considerations into pain management practices, healthcare systems can improve healthcare outcomes globally. Emphasizing cultural competency in healthcare delivery, developing culturally sensitive assessment tools, and fostering research on cultural influences in pain perception are crucial steps towards achieving equitable access to pain care for all individuals, regardless of cultural background. Through collaborative efforts across healthcare disciplines, researchers, policymakers, and community stakeholders, we can work towards a future where cultural

diversity is celebrated and healthcare services are accessible, inclusive, and responsive to the diverse needs of patients worldwide.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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