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Role of Pain Coping Strategies in Resilience among Osteoarthritis Patients

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Abstract: The current investigation explores the association between pain coping strategies and pain resilience in individuals diagnosed with osteoarthritis, employing a correlational research design. A convenient sampling technique was employed to gather data from 150 clinically diagnosed osteoarthritis patients, including 91 females and 59 males aged between 45 and 65 years. These participants were sourced from various clinics and hospitals in the Delhi-NCR region. Pain coping strategies and pain resilience were evaluated using the Coping Strategy Questionnaire and the Pain Resilience Scale, respectively. The statistical analysis employed correlation and regression methods. The study revealed noteworthy positive correlations between pain resilience factors (specifically cognitive positivity and behavioral perseverance) and adaptive pain coping strategies. Cognitive positivity exhibited a noteworthy inverse relationship with catastrophizing as well. Additionally, regression analysis highlighted that increased engagement in behavioral activities, ignoring sensations, and employing coping self-statements were predictors of pain resilience among osteoarthritis patients. This suggests that patients with chronic pain who adopt adaptive pain coping strategies and steer clear of maladaptive coping mechanisms are more likely to exhibit pain resilience or positive adaptation amidst challenges. This research contributes valuable insights into understanding the intricate relationship between pain coping strategies and pain resilience. By shedding light on this complex interplay, the study offers potential avenues for optimizing pain management and fostering resilience in individuals grappling with chronic musculoskeletal conditions like osteoarthritis. The implications of these findings extend to clinical practice, intervention development, and future research endeavors, with the prospect of enhancing outcomes and improving the quality of life for those affected by osteoarthritis.

Keywords: Pain Resilience, Cognitive Positivity, Behavioral Perseverance, Pain Coping Strategies, Osteoarthritis, Adaptive coping, maladaptive coping.

Introduction: Osteoarthritis (OA) is a common chronic degenerative joint condition that is identified by the slow deterioration of cartilage, resulting in pain, stiffness, and reduced function in

the impacted joints. (Hunter & Bierma-Zeinstra, 2019). It is a leading cause of disability worldwide, affecting millions of individuals and posing significant challenges to healthcare systems globally (Neogi, 2013). In the face of persistent pain and physical limitations associated with osteoarthritis, individuals often employ various coping mechanisms to manage their symptoms and maintain a sense of well-being. Pain management strategies encompass a diverse array of cognitive, behavioral, and emotional approaches employed by individuals to reduce the impact of pain on their daily lives (Jackson & Wang, 2019). These approaches may involve diverting attention, reinterpreting pain sensations, ignoring sensations, using coping self-talk, increasing behavioral activities, catastrophizing, and seeking solace in prayer or hope. However, the effectiveness of pain management strategies in mitigating the negative consequences of osteoarthritis goes beyond mere symptom management. Emerging evidence suggests a significant interplay between these coping mechanisms and the concept of resilience that is, the ability to adapt positively in the face of adversity (Smith et al., 2020). Resilience, in the context of osteoarthritis, encompasses not only the ability to endure pain and disability but also to thrive and maintain a satisfactory quality of life despite the challenges posed by the disease.

Despite the growing recognition of the importance of pain coping strategies and resilience in the management of osteoarthritis, the specific mechanisms underlying their relationship remain poorly understood. Consequently, there exists a critical need for research aimed at elucidating the influence of pain coping mechanisms on resilience among individuals with osteoarthritis. This paper seeks to address this gap in the literature by exploring the intricate interplay between pain coping strategies and resilience in osteoarthritis patients. By investigating how different coping mechanisms influence resilience and well-being in this group, our objective is to advance the understanding of effective strategies for improving pain management and building resilience in the context of chronic musculoskeletal conditions. This study seeks to illuminate the intricate relationship between pain coping strategies and resilience in osteoarthritis patients by conducting a thorough examination of current literature and empirical research. The findings will have implications for clinical practice, the development of interventions, and guiding future research endeavors. By clarifying the processes by which individuals suffering from osteoarthritis manage pain and challenges, we can customize strategies designed to boost resilience and enhance results among this susceptible group within the cultural setting of Haryana and Delhi NCR.

Objectives:
1. To examine the correlation between pain coping mechanisms and pain resilience among individuals with osteoarthritis.
2. To determine the extent to which pain coping strategies can forecast pain resilience in osteoarthritis patients.

Hypotheses:
1. A notable association is expected to be found between pain coping strategies and pain resilience in osteoarthritis patients.
2. Pain coping strategies are anticipated to be a significant predictor of pain resilience in individuals with osteoarthritis.

Method

Research Design: The current study employed a correlational research design to explore the relation between pain coping strategies and pain resilience among patients with osteoarthritis.

Sample: The participants for this research were selected from a wide variety of healthcare facilities, encompassing orthopedic and rehabilitation departments in both government and private hospitals. Additionally, private physiotherapy and occupational therapy centers situated in Rewari, Rohtak, and the Delhi National Capital Region (NCR) were also included in the sample. The study encompassed a total of 150 osteoarthritis patients, comprising 91 females and 59 males aged between 45 and 65 years. The mean age of the sample was 61.007 years (SD = 3.48), and patients with or without co-morbidities were included based on predefined inclusion and exclusion criteria. To be eligible for participation, patients needed to have minimum diagnosis duration of 2 years and be undergoing treatments such as medication, physiotherapy, or both. Additionally, respondents were required to have at least a 12th-grade educational qualification. Patients who did not meet these criteria, including those recently diagnosed with arthritis (within two years), individuals below or above the specified age range of 45-65 years, illiterate patients, and those affected by severe medical conditions necessitating long-term therapies (such as cancer), recent injuries, or serious mental disorders alongside arthritis, were excluded from the study.

Tools: The data collection process involved utilizing the following tools:

Assessment of Pain Coping Strategies

Coping Strategy Questionnaire (CSQ): The current research utilized the Coping Strategy Questionnaire (CSQ) version one and two items, created by Jensen et al. (2003), to assess pain coping strategies. The shortened version of the CSQ is comprised of 14 items, with each of the seven pain coping strategies being depicted by two items. These strategies encompass diverting attention, reinterpreting pain sensations, ignoring sensations, coping self-statements, engaging in increased behavioral activities, catastrophizing, and resorting to prayer or hope. Responses to the questionnaire items are rated on a scale ranging from 0 to 6, with scores for the two-item CSQ scales calculated as the averages of the respective two items on each scale. Extensive research has supported the validity of this scale, demonstrating strong correlations (Pearson r = 0.78 to 0.92) with the original CSQ scales and showing associations with various criterion variables in chronic pain patient samples (Jensen et al., 2003; Tan et al., 2006). Additionally, Riddle & Jensen (2013) confirmed the sound construct and criterion-based validity of the CSQ in individuals dealing with chronic pain, specifically due to knee osteoarthritis.

Assessment of Pain Resilience

Pain Resilience Scale: The Pain Resilience Scale, created by Slepian et al. (2016), consists of 14 items and is a self-assessment tool used to measure an individual's ability to withstand pain through the examination of cognitive/affective positivity and behavioral perseverance. Participants assess each item on a scale that ranges from 0 (not at all) to 4 (to a great extent), reflecting their capacity to maintain positive emotions and cognitive regulation during painful experiences, as well as their persistence in behavioral efforts despite pain. The scale includes two distinct subscales: Cognitive or Affective Positivity, which measures the perceived ability to manage thoughts and emotions in the presence of pain, and Behavioral Perseverance, which evaluates the determination and persistence in carrying out activities despite pain intensity or duration. Scoring involves summing items 1 to 5 to derive the Behavioral Perseverance score, while the remaining items contribute to the Cognitive Positivity score. The overall Pain Resilience score is obtained by summing all 14 items. The Pain Resilience Scale has demonstrated robust psychometric properties, making it a reliable and valid instrument for evaluating pain resilience in research and clinical settings.

Procedure: Participants in this study were recruited from diverse healthcare settings, including private and government healthcare facilities, physiotherapy, and occupational therapy centers, provided they met the predefined inclusion and exclusion criteria. Before participating in the study, individuals provided informed consent. Throughout the assessment process using the Pain Coping Strategies and Pain Resilience scales, confidentiality of participant responses was strictly

maintained. All participants completed the questionnaire items as required. The collected data underwent analysis through the utilization of SPSS-16 software, as detailed in the findings and discussion segment.

Results

The preliminary data examination employed descriptive statistics in order to investigate the attributes of osteoarthritis (OA) participants included in the research. The participants' average age was 61.007 years (SD = 3.48), falling within the specified age range of 45 to 65 years. Table 1 offers an exhaustive analysis of the mean and standard deviation for both Pain Coping Strategies and Pain Resilience, in addition to the minimum and maximum scores identified in these assessments.

Table 1.

Mean value and Standard deviation value of Pain Coping Strategies and Pain Resilience

Variables	Mean values	S. D. values	Possible range
Pain Coping Strategies			
Diverted attention	3.36	1.76	0 to 6
Reinterpreting sensations	2.36	1.50	0 to 6
Ignoring sensation	2.32	1.58	0 to 6
Coping self-statements	3.57	1.71	0 to 6
Behavioral activities	3.65	1.85	0 to 6
Catastrophising	2.93	1.68	0 to 6
Praying / hoping	3.88	1.87	0 to 6
Pain resilience	30.06	13.21	0 to 56
Cognitive Positivity	19.59	9.17	0 to 36
Behavioral Perseverance	10.47	4.63	0 to 20

The mean values for cognitive positivity and behavioral perseverance were found to exceed the midpoint of the score range, indicating relatively high levels of these traits within the sample. Specifically, participants scored an average of 19.59 (SD = 9.17) on cognitive positivity (possible range: 0 to 36) and 10.47 (SD = 4.63) on behavioral perseverance (possible range: 0 to 20). Moreover, the overall pain resilience score for the sample was 30.06 (SD = 13.21), also surpassing the midpoint of the score range. In terms of pain coping strategies, the mean scores for diverting attention, coping self-statements, behavioral activities, and praying or hoping were above the midpoint (possible range: 0 to 6), indicating a tendency among participants to employ these strategies. Conversely, the mean scores for reinterpreting pain sensations, ignoring sensations, and catastrophizing fell below the midpoint. Among the pain coping strategies, praying or hoping had the highest mean score (3.88), followed by behavioral activities (3.65), coping self-statements (3.57), and diverting attention (3.36). Catastrophizing had a mean score of 2.93, while reinterpreting sensations and ignoring sensations had mean scores of 2.36 and 2.32, respectively. The possible score range for all pain coping strategies was 0 to 6.

The primary objective of this study was to explore how Pain Coping Strategies influence Pain Resilience among osteoarthritis (OA) patients. The findings derived from the correlation analysis, as presented in Table 2, unveil a number of noteworthy results. To begin with, the analysis reveals that Cognitive Positivity exhibits significant positive correlations with various pain coping strategies. These strategies include Diverting attention (r = .657, p < 0.01), Reinterpreting sensations (r = .409, p < 0.01), Ignoring sensations (r = .533, p < 0.01), Coping self-statements (r = .634, p < 0.01), and Behavioral activities (r = .743, p < 0.01). These correlations indicate that individuals with higher levels of cognitive positivity are more likely to employ adaptive pain coping strategies. Similarly, Behavioral Perseverance also demonstrates significant positive correlations with

Diverting attention (r = .606, p < 0.01), Reinterpreting sensations (r = .381, p < 0.01), Ignoring sensations (r = .576, p < 0.01), Coping self-statements (r = .542, p < 0.01), and Behavioral activities (r = .696, p < 0.01). This indicates that individuals with higher levels of behavioral perseverance tend to utilize more adaptive pain coping strategies as well.

Table 2.

Correlation Coefficients between Pain resilience and Coping Strategies to Pain

Variables	Pain Coping Strategies						
	DA	RP	IS	CSS	BA	CT	PH
Pain resilience							
Cognitive Positivity	.657**	.409**	.533**	.634**	.743**	-.196*	-.072
Behavioral Perseverance	.606**	.381**	.576**	.542**	.696**	-.082	-.056

**p<0.01   *p<0.05*

Note. DA= Diverted attention; RP= Reinterpretation of pain sensations; IS= Ignoring pain sensations; CSS= Coping statements to self; BA= Behavioural activities; CT= Catastrophising; PH= Praying/hoping.

However, it's noteworthy that cognitive positivity (r = -.196, p < 0.05) exhibited a significant negative correlation with Catastrophizing. This suggests that higher levels of cognitive positivity are associated with lower tendencies toward catastrophizing, which is considered a maladaptive pain coping strategy. Overall, these correlation findings shed light on the intricate relationship between pain coping strategies, cognitive positivity, behavioral perseverance, and pain resilience among OA patients, highlighting the importance of adaptive coping mechanisms in managing chronic pain effectively. The correlation coefficients between Pain Resilience and Pain Coping Strategies indicate a strong relationship, ranging from .381 to .743. These findings suggest that osteoarthritis patients who use adaptive pain coping methods such as diverting attention, reinterpreting pain sensations, ignoring pain, employing coping self-statements, and engaging in behavioral activities are more likely to demonstrate high levels of cognitive positivity, motivation, and behavioral tenacity in managing chronic pain or more pain resilience. On the other hand, patients who catastrophizes about pain are less likely to feel capable of regulating their thoughts and emotions, thus showing lower levels of pain resilience.

In order to gain a more comprehensive understanding, a regression analysis was conducted to ascertain the key factors that contribute to Pain Resilience. Specifically, the study focused on examining the influence of pain coping strategies on cognitive positivity and behavioral perseverance in individuals suffering from osteoarthritis. The results, as outlined in Table 3, indicate that behavioral activities emerged as the most influential predictor, explaining a substantial variance in both cognitive positivity (55.2%) and behavioral perseverance (48.5%) when entered in step 1 of the regression model. Ignoring pain sensations also contributed significantly to cognitive positivity and Behavioral perseverance, entering at step two and explaining additional variances of 8.8% and 13% respectively. Coping self-statements, although entering at step three, predicted cognitive positivity alone, accounting for 2.2% of the variance.

The positive regression coefficients ('B') for behavioral activities, ignoring pain sensations, and coping self-statements suggest a beneficial influence on regulating emotions, cognition, and displaying greater behavioral and motivational resilience in chronic pain management among osteoarthritis patients.

Table 3.

Predictors of Pain Resilience (cognitive positivity and behavioural perseverance)

Criterion Variables	Predictor variables	Multiple R	R Square	R Square Change	B	F

Cognitive Positivity	Behavioural activities	.743	.552	.552	3.68	182.66**
	Ignoring sensations	.800	.641	.088	1.84	131.07**
	Coping self - statements	.814	.662	.022	1.05	95.49**
Behavioural Perseverance	Behavioural activities	.696	.485	.485	1.74	139.25**
	Ignoring sensations	.784	.615	.130	1.13	117.32**

***p< .01*

The regression analysis findings indicate that osteoarthritis patients who are more involved in activities and ignore painful sensations are more likely to regulate their emotions and cognition, also display greater behavioral and motivational tenacity in chronic pain. However patients who use more of self-statements in order to cope up with pain also tend to regulate their emotions and cognition or we can say have more cognitive positivity. The findings from correlation and regression analyses provide strong evidence in favor of the hypothesis that pain coping strategies significantly contribute to improving pain resilience in individuals with osteoarthritis.

 Discussion: The study sheds light on the intricate relationship between pain resilience and various pain coping strategies among osteoarthritis (OA) patients. With correlation coefficients ranging from .381 to .743, it emphasizes the importance of understanding how individuals manage chronic pain and its impact on their resilience (Jones et al., 2020; Woby et al., 2021). One key insight is the predictive power of pain coping strategies in determining levels of pain resilience. Adaptive coping mechanisms includes diverted attention, reinterpretation of painful sensations, ignorance of pain sensations, coping statements to self, and engagement in the behavioural activities, are associated with higher levels of cognitive positivity, motivational tenacity, and behavioral perseverance in the face of chronic pain. Regression analysis highlights the specific contributions of different coping strategies to pain resilience, with behavioral activities emerging as the most influential predictor. This underscores the role of active engagement in physical and social activities in coping with pain and fostering resilience (Jones et al., 2020; Woby et al., 2021). Additionally, the significance of ignoring pain sensations underscores the importance of selective attention and cognitive regulation in coping with pain. Individuals who can disengage from or minimize the salience of pain sensations may exhibit greater adaptability and resilience in their responses to pain stimuli. Coping self-statements also emerge as a significant predictor of cognitive positivity, suggesting the role of internal cognitive processes in shaping individuals' perceptions of pain and maintaining a positive outlook in the face of adversity (Gauthier et al., 2019). However, the study highlights the negative impact of pain catastrophizing on perceived ability to regulate cognitions and emotions, as well as on overall pain resilience. Maladaptive coping strategies, such as magnification of pain-related distress and helplessness, can detrimentally affect psychological adjustment and functional outcomes (Sullivan et al., 2001).

The findings highlight the complex nature of pain resilience and the crucial importance of employing effective pain coping mechanisms to reduce the negative effects of chronic pain on overall quality of life. By elucidating the mechanisms through which specific coping strategies contribute to resilience, this research provides valuable insights for the development of targeted interventions in chronic pain management. Future research could explore the longitudinal trajectories of pain coping strategies and resilience outcomes to better understand the dynamic interplay between coping processes and psychological adaptation to chronic pain over time (Smith et al., 2022; Patel et al., 2023). Investigating the moderating effects of demographic and clinical variables may provide further insights into individual differences in pain resilience and coping

efficacy among OA patients. Recent studies have highlighted the importance of incorporating mindfulness-based interventions and cognitive-behavioral therapy techniques in pain management programs for OA patients, showing promising results in improving pain coping skills and enhancing resilience to chronic pain. Despite the multifaceted nature of patients' lives, resilience stands out as a stable individual resource. Future longitudinal studies employing sophisticated modeling techniques are warranted to elucidate the complex interplay between pain coping and resilience in OA (Smith et al., 2022; Patel et al., 2023).

Nevertheless, several limitations should be acknowledged when interpreting the findings of this study. These include a relatively small sample size, gender imbalance, the sampling technique employed, and the omission of demographic variables such as gender, age, and socio-economic status. The presence of a correlational design restricts the ability to examine the connection between pain coping and pain resilience in patients with osteoarthritis. To gain a better understanding of this relationship, it is necessary to conduct longitudinal studies that explore the temporal associations as well as identify any potential mediators and moderators involved. Moreover, relying solely on self-report measures may introduce response bias and social desirability effects, which could impact the validity and generalizability of our findings. Future research should consider these complexities to enhance the generalizability and robustness of future studies in this domain.

Conclusion: In conclusion, our study highlights the intricate relationship between pain resilience and various coping strategies among osteoarthritis (OA) patients. Adaptive coping mechanisms, particularly engagement in behavioral activities and cognitive regulation, significantly contribute to higher levels of resilience in managing chronic pain. Maladaptive strategies, such as pain catastrophizing, negatively impact resilience and psychological adjustment. Incorporating mindfulness-based interventions and cognitive-behavioral therapy techniques in pain management programs shows promise in enhancing pain coping skills and resilience. However, limitations including sample size, sampling technique and reliance on self-report measures should be addressed in future research to enhance the generalizability and robustness of findings in this domain. Longitudinal studies are warranted to elucidate temporal associations and better understand the interplay between pain coping and resilience among OA patients. Future research should delve into the mechanisms linking pain resilience and pain coping offering more personalized treatment approaches for this population.

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