

Research Paper

Impact of Different Facets of Empathy on Pain Perception of College Students from Kolkata

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ABSTRACT

Aim: This study explores the role of different facets of empathy on perceived pain among college students in Kolkata. Perceived pain encompasses both physiological and psychological dimensions, influenced by an array of factors. Two primary types of empathy exist: cognitive empathy and affective empathy. While prior research has extensively examined the impact of empathy on understanding others' pain, this study delves into its effect on an individual's perception of their own pain. **Methods:** An ex-post facto-correlational type research design was used and 100 college students in Kolkata were selected through purposive sampling. Perth Empathy Scale (PES) and Bodily and Emotional Perception of Pain Questionnaire (BEEP) were administered to the sample. **Results:** The findings reveal a significant association between affective empathy and both limitations due to pain and interference with personal and social functioning. Cognitive empathy, however, did not demonstrate a significant relationship with any pain dimension. The study underscores the significance of recognizing the intricate interplay between affective empathy and personal pain perception. The implications extend to understanding pain management and the need for holistic approaches that consider emotional factors. This research also underscores the necessity for further investigation into the relationship between empathy and pain perception, and utilizing it in necessary interventions.

Keywords: Pain, Empathy, Pain Perception, Affective empathy, Cognitive Empathy

Perceived pain is the subjective encounter of pain, influenced by physiological, psychological, and social factors. As defined by the International Association for the Study of Pain (International Association for the Study of Pain (IASP), 2020), pain is an unpleasant sensory and emotional experience linked to actual or potential tissue damage. The brain's pain matrix, a network of regions involved in pain processing, is impacted by cognitive and emotional factors, affecting the intensity and duration of perceived pain (Rainville *et al.*, 1997).

Various theories explain perceived pain. The specificity theory suggests pain severity is directly linked to tissue damage, resulting from physical stimulation of pain receptors. The pattern theory posits that pain perception is determined by specific nerve impulse patterns

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sent to the brain. The gate control theory proposes a spinal "gate" that can be opened or closed by various factors, influencing pain perception. The neuromatrix theory introduces the brain's "neuromatrix," which generates pain sensations and receives inputs beyond physical harm, including emotional and cognitive aspects. The biopsychosocial model adopts a holistic perspective, acknowledging the complexity of pain involving biological, psychological, and social elements. Pain, therefore, arises from the interaction of these diverse variables (Dydyk *et al.*, 2022).

Perceived pain is a multifaceted phenomenon influenced by various factors, including biology, psychology, society, and culture. The physiological aspect of pain, known as "objective pain," represents the actual tissue damage or injury that triggers the pain response, and people with the same injury will generally experience this type of pain (Wideman *et al.*, 2019). In contrast, "subjective pain" refers to an individual's unique perception of pain, influenced by their psychological and emotional state, beliefs, and past experiences. It is a personal and individualized experience, making it impossible for others to directly observe or quantify. Different individuals may interpret the same level of objective pain differently, and even a person may experience varying levels of subjective pain in different situations (Wideman *et al.*, 2019). While objective pain helps identify the physical cause of pain, it is crucial to recognize that subjective pain holds greater significance in understanding the patient's experience and quality of life. Therefore, both the objective and subjective aspects of pain should be considered when assessing and managing pain.

Empathy is a fundamental human ability to comprehend and perceive the feelings and experiences of others. It plays a crucial role in establishing meaningful connections and fostering positive social interactions. Two primary types of empathy exist i.e., Cognitive empathy and Affective empathy. Cognitive empathy involves understanding another person's perspective and emotions without necessarily sharing the same feelings (Maibom, 2017). It allows individuals to put themselves in others' shoes and speculate about their thoughts and emotions, aiding in effective communication, conflict resolution, and social problem-solving. Affective empathy, on the other hand, refers to the ability to experience and understand the emotions of others, even without directly experiencing the same situation (Hall & Bernieri, 2001). This form of empathy enables people to emotionally connect with others and respond compassionately to their feelings.

Research indicates that individuals with higher levels of empathy tend to be more emotionally attuned to the pain experienced by others, and this sensitivity can also impact their own perception of pain. Some studies have demonstrated that individuals with greater empathy scores tend to have lower pain thresholds and tolerance levels (Jackson *et al.*, 2005). Moreover, empathetic responses can influence how people perceive pain in social situations. Observing others in distress can lead to an enhancement in one's own perception of pain, indicating a phenomenon known as vicarious pain sharing (Chen & Wang, 2022). Being empathetic is related to sensitivity and can also lead to heightened pain perception. Green *et al.* (2009) have found that high empathy is related to a higher accuracy of perception of pain of other individuals. Some studies have found that people who are more empathetic also show a high subjective perception of pain due to their heightened emotional processing (Goubert *et al.*, 2004). It has been similarly found that high empathy and compassion are related to high perceived pain and personal distress (Gleichgerrcht & Decety, 2014; Grynberg & Konrath, 2020). On the contrary, some other studies have reported no such relationship and have considered both these variables to be independent of

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each other (Sambo *et al.*, 2010). Empathy has two facets and there have been debates on which facet of empathy is more beneficial for functioning. It has been found that affective empathy is linked to lower emotional regulation and higher sensitivity (Thompson *et al.*, 2022).

The current body of literature regarding perceived pain and empathy reveals significant gaps. While numerous studies have concentrated on the perception of pain and experiencing the pain of others, little attention has been given to one's personal pain perception. This underscores the need for research to elucidate the interplay between our empathetic responses toward others and our processing of physical pain on a personal level.

Despite the limited exploration of empathy and self-pain perception, the existing findings remain inconclusive. Some studies indicate a positive correlation between higher empathy levels and increased sensitivity to pain, whereas other investigations have failed to establish such a connection. Additionally, the examination of various types of empathy and their association with pain warrants thorough investigation. Although Affective empathy has been associated with heightened emotional reactions, and such reactions are linked to amplified pain perception, studies directly investigating the relationship between affective empathy and self-pain perception are scant. The research landscape in India is notably deficient in studies concerning the correlation between pain and empathy and no research to date has explored the relationship between empathy and an individual's own pain perception within this demographic. To bridge these significant gaps and contribute valuable insights to the existing literature, the present study aims to analyse the influence of distinct dimensions of Empathy on the perceived pain experienced by college students in Kolkata.

MATERIALS & METHODS

Objectives

- To determine whether any relationship exists between different facets of Empathy and Perception of Pain in College students in Kolkata.
- To determine whether different facets of empathy impacts different dimensions of pain perception.

Hypothesis

- H1: There lies a significant relationship between cognitive empathy and limitations caused by pain in daily life among college students in Kolkata
- H2: There lies a significant relationship between cognitive empathy and emotional reaction to pain among college students in Kolkata
- H3: There lies a significant relationship between cognitive empathy and interference with personal social functioning among college students in Kolkata
- H4: There lies a significant relationship between affective empathy and limitations caused by pain in daily life among college students in Kolkata
- H5: There lies a significant relationship between affective empathy and emotional reaction to pain among college students
- H6: There lies a significant relationship between affective empathy and interference with personal social functioning among college students
- H7: There lies a significant association between cognitive empathy and limitations caused by pain in daily life among college students in Kolkata
- H8: There lies a significant association between cognitive empathy and emotional reaction to pain among college students in Kolkata

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- H9: There lies a significant association between cognitive empathy and interference with personal social functioning among college students in Kolkata
- H10: There lies a significant association between affective empathy and limitations caused by pain in daily life among college students in Kolkata
- H11: There lies a significant association between affective empathy and emotional reaction to pain among college students
- H12: There lies a significant association between affective empathy and interference with personal social functioning among college students.

Research Design

Ex-Post facto: correlational type research design was used.

Sampling

Purposive sampling technique was used and data from 100 participants were collected from different colleges based on the following criteria:

Inclusion criteria:

- Participants must be within the age range of 18 to 25 years.
- The participants must be studying in a College or University located in Kolkata
- The participants must be a resident of Kolkata
- Participants must have an understanding of the English language.

Exclusion criteria:

- Participants who have a diagnosed severe medical or mental health disorder.
- Participants who have given data to similar kinds of research
- Participants who do not give consent for publication of research based on the data

Tools used

- **Perth Empathy Scale (Brett, Becerra, Maybery, & Preece, 2022):** This scale is a 20-item self-report test of empathy. It is intended to evaluate both the affective and cognitive aspects of empathy, as well as both positive and negative emotions. The PES has been shown to have good internal consistency, with a Cronbach's alpha coefficient of .85.
- **Bodily and Emotional Perception of Pain Questionnaire (Preti, 2019):** This scale is used to measure three aspects of distress-induced reactions to pain: the emotional reaction to pain, the limitations on daily life caused by pain, and the interference with personal and social functioning caused by pain. The Chronbach alpha reliability has been found to be 0.70.

Statistical analysis

For the present study, the following statistical analysis was conducted:

- **Mean:** This was used to measure the average scores on different facets of empathy and pain perception obtained from the participants.
- **Standard Deviation:** This was used to measure the extent to which individual scores deviate from the mean for each variable.
- **Shapiro Wilk Test:** This was used to determine the normality of the distribution.
- **Pearson Product Moment Correlation:** This was used to determine whether there lies a relationship between different facets of empathy and different dimensions of pain perception.

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- **Multiple Regression Analysis:** This was used to measure the impact of different facets of empathy on different dimensions of pain perception.

Ethical Consideration

Informed consent was taken from all the participants before the collection of responses and their permission was also taken for the possible publication of data. They were informed that their identity would be kept confidential and they could opt out of the research whenever they wished.

RESULTS

Table 1: Sample Characteristics

Categories	N%
Age	
18-21 years	42%
22- 25 years	58%
Sexual Identity	
Males	50%
Females	50%
Educational Qualification	
Pursuing Under graduation	40%
Pursuing Postgraduation	60%

Table 2: Shapiro Wilk Test for Normality

Variables	Shapiro Wilk value	Significance level
Cognitive Empathy	.979	.153*
Affective Empathy	.993	.905*
Emotional reaction to pain	.982	.259*
Limitation due to pain	.987	.534*
Interference with personal social functioning	.980	.183*

* The significant levels indicate that all the variables are normally distributed

Table 3: Mean and Sd of variables under study

	Mean	Std. Deviation
Cognitive Empathy	31.2472	5.96635
Affective Empathy	28.7978	6.82772
Emotional Reaction to Pain	36.2022	15.99373
Limitation due to pain	10.0112	3.91528
Interference with personal social functioning	12.3708	4.63529

Table 4: Correlation of different facets of empathy with different aspects of Perceived Pain

Different Facets of Empathy and Emotional Reaction due to pain	Correlation coefficient
Cognitive Empathy and Emotional Reaction due to pain	0.150
Affective Empathy and Emotional Reaction due to pain	0.202
Different Facets of Empathy and Limitation due to pain	
Cognitive Empathy and Limitation due to pain	0.104
Affective Empathy and Limitation due to pain	0.213*
Different Facets of Empathy and Interference with personal social functioning	
Cognitive Empathy and Interference with personal social functioning	0.126
Affective Empathy and Interference with personal social functioning	0.225*

*Correlation coefficients are significant at 0.05 level of significance

From the above table, Affective Empathy has significant relationships with Limitation due to pain and Interference due to pain. On the other hand, Affective empathy has no significant relationship with emotional reaction to pain. Similarly, cognitive empathy also does not have any significant relationship with the three aspects of perceived pain. Therefore, we can say that hypotheses H5 and H6 are accepted and hypotheses H1, H2, H3 and H4 are rejected.

Table 5: Linear regression analysis to find out the association of Affective Empathy with Limitation due to pain and Interference with personal social functioning

Criterion Measures	Regression Coefficient	R square
Limitation due to pain	0.213*	0.046
Interference with personal social functioning	0.225*	0.051

*Regression coefficients are significant at 0.05 level of significance

From the above table, Affective Empathy has significant associations with both Limitation due to pain and Interference with personal social functioning. Therefore, hypotheses H11 and H12 have been accepted and hypotheses H7, H8, H9, and H10 have been rejected.

DISCUSSION

The present study is aimed at understanding the impact of different facets of empathy on different aspects of the perceived pain of college students from Kolkata. Table 1 indicated that the sample was equally distributed among two sexual identities (male and female) and there were similar numbers of students from undergraduate and postgraduate courses. Table 2 indicated that the data received for different variables are normally distributed and therefore, we could conduct parametric testing in the later stages of data analysis. Table 3 suggests that the average sample is more cognitively empathetic than affectively. It also suggests that the majority of the sample has an average level of perceived pain and its aspects.

From Table 4, Affective Empathy has a significant positive relationship with Limitation due to pain and Interference with personal social functioning. This means that individuals with

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higher affective empathy also get highly limited due to pain and pain interferes majorly with their personal and social domains of functioning. This finding has been supported by the studies of Grynberg & Konrath (2020) and Thompson *et al.* (2022) who also found that high affective empathy is related to lower higher pain perception. On the other hand, it has been found that Affective empathy does not have a significant relationship with Emotional reaction to pain. It has also been found that Cognitive empathy does not have a significant relationship with any aspect of perceived pain. Similar findings have been observed in the study of Sambo *et al.* (2010) who opined that no facet of empathy is related to perceived pain.

In terms of the connection between affective empathy and the limitation due to pain, it can be suggested that individuals with elevated levels of affective empathy tend to be more attuned to their own emotional ordeals, like distress, as well as the struggles of others. This heightened sensitivity could potentially lead to an increased recognition and responsiveness towards limitations posed by pain in their daily lives. Conversely, concerning the correlation between affective empathy and interference in personal social functioning, it can be posited that greater emotional distress and deeper emotional investment in social connections might arise due to affective empathy, which involves personally experiencing and partaking in the emotions of others (Dor-Ziderman *et al.*, 2021).

Table 5 indicates a significant association between affective empathy and both pain-related limitations and interference in personal and social functioning. This underscores the considerable influence of affective empathy on these aspects. Moreover, it becomes apparent that approximately 4.6% and 5.1% of the variation in limitation due to pain and interference with personal social functioning, respectively, can be ascribed to affective empathy. This observation aligns to some extent with a study by Goubert *et al.* (2004), which similarly revealed a link between empathy and perceived personal pain, suggesting that heightened empathy could magnify the experience of pain.

From this standpoint, it can be inferred that individuals with heightened affective empathy might be predisposed to reacting to pain with adverse emotions like anxiety or apprehension. Such emotional responses could impede daily tasks and exacerbate impairments, leading to amplified limitations in functioning due to pain. Furthermore, individuals with strong affective empathy might face emotional burdens that hamper their social interactions on an individual level. The association of elevated affective empathy with burnout and other detrimental consequences resulting from heightened emotional involvement in social connections, such as emotional exhaustion and interpersonal conflicts stemming from heightened emotional sensitivity, can be highlighted (Tang & Gibson, 2005).

Affective empathy has also been linked to heightened levels of anxiety, sadness, and other mental health challenges, further compromising an individual's social functionality. These factors could render an individual more susceptible to negative stimuli. Consequently, when experiencing physical pain, such individuals might exhibit an intensified reaction and struggle to cope due to their heightened sensitivity (Rotheram-Borus, 2000). This, in turn, contributes to escalated personal and social detriments. Eventually, the impact of this pain experience on personal and social functioning can be attributed to their heightened and exaggerated response to the pain stimulus.

Though, in this study there exist certain limitations such as a small sample, use of purposive sampling, and lack of effective generalizability yet the study has answered some questions

for the first time by being one of the first research on the effect of different facets of empathy of perception of personal pain. It can finally be said that high affective empathy might make all kinds of emotional processing quicker and more active and as pain has a lot of emotional components attached to it, therefore, such people process pain in an exaggerated manner leading to increased limitations in life and eventually hindrance in their personal and social functioning.

CONCLUSION

Based on the findings of this current study, it can be concluded that affective empathy significantly impacts limitations arising from pain and disruptions in personal and social functioning. Approximately 4.6% and 5.1% of the respective variations in these outcomes can be linked to affective empathy. As a result, hypotheses H4, H6, H10, and H12 have been affirmed within this study. Several noteworthy implications and avenues for future research emerge from these findings:

- Affective empathy doesn't solely shape our understanding of others' emotions, but it may also influence how we perceive our own experiences, such as pain.
- While empathy is generally regarded as a positive trait, an excessive level of affective empathy could potentially lead to adverse consequences by heightening emotional sensitivity to both mental and physical pain.
- The dearth of comprehensive research on the relationship between empathy and pain perception underscores the need for further investigation in this domain.
- Medical facilities specializing in pain management, including palliative care units, recognize that pain perception is subjective and influenced by one's mental state. Incorporating mental health professionals to assist individuals in achieving an optimal level of affective empathy might indirectly contribute to improved pain processing and management.
- This study underscores the necessity for research into pain perception and its subjective correlates, such as empathy, within the Indian population. This is particularly relevant given the tendency for numerous mental health issues to manifest as somatic symptoms due to prevailing mental health stigmas in the culture.

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Conflict of Interest

The author(s) declared no conflict of interest.

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