

Impact of Tolerance on Attention and Perceived Pain

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ABSTRACT

Tolerance, Attention and Perceived Pain have always been seen sharing some kind of relationship between them in such a way that either increase in one variable leads to the increased intensity of other or the other variable influences the first variable leading to some or the other thing. The study aimed at exploring the relationship between Tolerance Level, Attention and Tolerance Level and Perceived Pain. Two hypotheses pertaining to the same were postulated and tested using McGill Pain Questionnaire (MPQ-SCF), The Mindful Attention Awareness Scale (MAAS), and Distress Tolerance Scale (DTS) respectively. The sample comprised of 112 young adults (age 18-25) from Dehradun, Uttarakhand. Data was gathered through convenience sampling technique of data collection. A correlational research design was used to conduct the study. The analysis on the basis of statistical values was done using Correlational Analysis. The results of the study indicated that Tolerance level influences Attention in a low positive manner. The findings pertaining to the second hypothesis stated that Tolerance level share a very low positive relationship with Perceived Pain as well. Overall, it can be inferred by the result that Tolerance level has a positive impact on both the variables (Attention and Perceived Pain) respectively which means increase in the level of tolerance would lead to increased attention and perceived pain or vice versa.

Keywords: Tolerance, Perceived Pain, Attention

INTRODUCTION

Attention is defined as the ability to actively process specific information in the environment while tuning out other details, which possess a limitation in terms of duration and capacity. Tolerance on the other hand is defined as the permissible or allowable deviation from a specified value or standard (American Psychological Association). Whereas, Perceived pain is the perception of physiological pain, usually evoked by stimuli that cause or threaten to cause tissue damage. (American Psychological Association). We generally link low tolerance and more attention to pain perception in a way that, more is the pain stimuli attended or the lower the tolerance for pain, more will be the perceived pain. This might contribute to or account for emotional stress as highlighted by McCracken (1997) in their study on “Attention to pain in persons with chronic back pain: A

behavioral approach” explaining the positive impact of attention on pain resulting in higher intensity of pain and increased emotional distress among people. Low tolerance is also often accompanied by feelings of unpleasantness as claimed by Bushnell et.al, (1989) in their study on Effects of attention on the intensity and unpleasantness on thermal pain providing the bases of positive impact of attention on the pain intensity resulting in increased pain and unpleasantness. While attention is capable of increasing the pain intensity, it is not always an attributable factor when it comes to unbearable or extreme pain. The statement is supportive of a study conducted by Vidnyanszky et.al, (2009) on Attentional modulation of perceived pain intensity in capsaicin induced secondary hyperalgesia showcasing negligible association between attention and pain intensity, they further stated that attention might influence pain intensity through independent mechanisms.

The expression of pain is dependent upon multiple factors such as genetics, psyche, society and culture. The statement is favored by the study of Borus (2004) on Variations in Perceived Pain Associated with Emotional Distress and Social Identity in AIDS proving a positive relationship between self-reported pain and cultural factors. Another study by James (2013) provides an empirical bases to the statement through their study on Human pain and genetics: some basics explaining the positive association between differences in genetics and individual pain experiences. Severe pain not only causes misery but also affects the normal functioning of an individual accounting for poor functioning in some cases. The emotional Distress caused due to perceived pain does not only adds to negative mental health but also makes an individual susceptible for mental health conditions such as Depression, Anxiety, Post traumatic stress disorder etc. The statement is suggestive of the findings by Praag (2009) in their study on Can stress cause depression? Stating an association between emotional stress and anxiety driven depression.

Rationale:

The theories of selective attention as postulated by Broadbent, 1958 (Broadbent’s Filter Model) & Treisman ,1964 (Treisman’s Attenuation Model) claims the presence of a bottleneck filter based on which a stimulus is attended depending upon the physical characteristics of the stimuli. The present study aims at exploring the association between attended pain stimuli and perceived pain (Attention & Perceived Pain) as suggested by Brewer & Karoly (2012) in their study effects of attentional focusing on pain perception highlighting higher pain ratings in presence of painful stimulation. Perceived pain also activates emotions such as tension, worry, anxiety etc. accounting for emotional distress which negatively influences the mental health of an individual.

The GAS (General Adaptation Syndrome) model of stress also explains the body’s response to stressful stimuli / stress in three stages (alarm reaction, resistance and exhaustion), explaining the physiological signs and symptoms accompanied by emotional distress which might act as a leading factor in terms of increased pain perception.

Objectives:

1. To investigate the association between Tolerance and Perceived Pain.
2. To investigate the association between Tolerance and Attention

Hypotheses:

H₁: There will be a significant relationship between Tolerance and Attention.

H₂: There will be a significant relationship between Tolerance and Perceived Pain.

Review of Literature:

The study aimed at exploring the relationship between Attention and Pain Perception. The researchers Chayadi & McConnell (2019) highlighted that attention significantly impacts the level of perceived pain in their study Gaining insights on the influence of attention, anxiety and pain perception. They further proposed that effective attention strategies may help in attenuating pain. Another study was conducted by Dammea et al., (2010) on Keeping in mind: A motivational account of attention to pain. The researchers in their study emphasized on the significant relationship between pain and attention and that pain is more in individuals who focus their attention more on painful stimuli. The study gave a clarity of how pain is dependent on attention and that without a significant amount of attention the sensation of pain is not intensely experienced. The study Pain demands attention: A cognitive – affective model of the interruptive function of pain was conducted by Eccleston et al., (1999). The researchers Miron, Duncan & Bushnell (1989) conducted a study examining the effects of attention on the intensity and unpleasantness of thermal pain revealing the positive relationship between attention and pain stimuli. The researchers further proposed that changes in the direction of attention may alter the response to noxious pain stimuli.

The research was carried out emphasizing on the impact of painful stimuli on attention and distraction condition. Results indicated that while opting for distraction the participants experienced significantly lower pain than those who opted attending painful stimuli. The Study was carried out by Tracey et al., (2002). Another research was conducted highlighting the comparison of the effect of attention training on relaxation on pain responses. Researchers Sharp et al., (2010) revealed the positive association between attention training and pain intensity. The participants who received attention training reported reduction in hypervigilance to sensory pain. Keogh, Hatton & Ellery (2000) examined the attentional strategies among males and females in context of pain. The focus was to determine how the two different gender responds to induced pain. As a result of the study, gender was seen to be moderating pain, males had an upper edge in terms of tolerating induced pain than females.

As a result of the study by Bantick et al., (2002) on imaging how attention modulates pain in humans using functional MRI pain was seen to be significantly reducing in the participants who were distracted during the pain tasks, many areas of pain matrix (thalamus, insula etc.) were seen to have showing less activation during distraction. While the participants who attended the pain tasks reported significantly higher painful experiences. Ferentzi et al., (2021) discovered that males have a relatively higher pain threshold and tolerance level than females in their study ‘Interaction Between Sex and Cardiac Interoceptive Accuracy in Measures of Induced Pain’. The study was conducted on a large sample of young adults (n = 159, 50.9% female, age: 23.45, SD = 3.767), however no association was found between cardiac interoceptive accuracy and pain sensitivity.

Methodology:

Sample:

The sample comprised of young adults (all genders) from Dehradun between ages 18 to 25 respectively. A sample size of 114 young adults was incorporated for the study. The inclusion criteria required the participants to be falling between the desired ages (18-25) and to be hailing from Dehradun as they were easy to target and convenient for the study.

Sampling Technique:

The data was collected through convenience sampling technique. This type of sampling technique involves the selection of the participants based on their convenience and availability.

Research Design:

The research method that has been employed in the study is quantitative research method whereas the research design that has been used is correlational research design as it emphasizes on exploring the correlation between different variables.

Measure:

Considering the nature of the problem statement following three scales were incorporated in order to explore the correlation between the variables.

1. The Mindful Attention Awareness Scale (MAAS): The scale was developed by Brown & Ryan (2003). MAAS is a 15-item, 6-point Likert scale that ranges from 'Almost always' (1) to 'Almost never' (6) which intends at measuring the level to which individuals attend different stimulus during different tasks. It assesses the disposition of individuals for mindfulness, attention and awareness in their daily life activities. The scale has a good reliability and validity. The Cronbach's alpha reliability was seen to be .92 respectively. The MAAS correlated positively with life satisfaction and negatively with psychological inflexibility and dysfunctional attitudes.
2. McGill Pain Questionnaire (SF-MPQ): The short form of the pain questionnaire was developed by Dr. Milzack at McGill University in 1993. The scale aims at measuring the pain affection and present pain intensity. It is a 15 item, 4-point Likert scale which ranges from 'None' (0) to 'Severe' (3). The Cronbach's alpha reliability and ICC were found to be 0.93 and 0.94 respectively). A strong relationship was found between SF-MPQ and other scales ($r = 0.55$ to 0.85).
3. Distress Tolerance Scale (DTS): The scale was developed by Simons & Gaher (2005). The scale is a 15 -item ,5 point Likert scale ranging from 'Strongly Agree' (1) to 'Strongly Disagree' (5) with four subscales; Tolerance (perceived capacity to tolerate emotional suffering, Appraisal (subjective evaluation and acceptance of emotions), Absorption (Tendency to focus attention on negative emotions) and Regulation (tendency to make effort to diminish emotional suffering). The Cronbach's alpha reliability for the entire scale and tolerance, regulation, appraisal subscales were found to be .89, .90, .80 and .64 respectively. The scale was seen to have correlation at 0.01 between Tolerance Trait Anxiety Inventory and also with State Anxiety Inventory.

Procedure:

As a part of the procedure, before handing over the questionnaire to the participants it was made sure that the participants has given their consent to be a part of the study. The participants were briefed about the study and their role as potential participants. After an ice breaking session with the participants each questionnaire was one by one handed over to them along with the instructions. A small break of 1 minute (inclusive of general conversation) was given after every questionnaire.

Data Analysis:

Data was analyzed using Correlation Analysis.

Result:

Table 1: Impact of Tolerance Level on Attention

Correlations

		TOLERANCE LEVEL	ATTENTION
TOLERANCE LEVEL	Pearson Correlation	1	.337**
	Sig. (2-tailed)		<.001
	N	112	112
ATTENTION	Pearson Correlation	.337**	1
	Sig. (2-tailed)	<.001	
	N	112	112

** . Correlation is significant at the 0.01 level (2-tailed).

The table above represents the correlation analysis of a sample (112) from Dehradun. The Correlation analysis was done to examine the impact one variable (Tolerance Level) has on another (Attention) or the relationship both the variables share. Pearson Correlation method plus two tailed test was brought in use in order to investigate the relationship. The data in the table above represents a low positive correlation between the variables Tolerance Level and Attention which indicates that the level of tolerance has an impact on attention or influences it in a positive manner. The significant value was at .001 which is less than 0.01 which indicates that it is significant statistically. Hence the hypothesis; There will be a significant relationship between Tolerance and Attention (H₁) gets accepted.

Table 2: Impact of Tolerance Level on Perceived Pain

		TOLERANCE LEVEL	PERCEIVED PAIN
TOLERANCE LEVEL	Pearson Correlation	1	.232*
	Sig. (2-tailed)		.014
	N	112	112
PERCEIVED PAIN	Pearson Correlation	.232*	1
	Sig. (2-tailed)	.014	
	N	112	112

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 again represents the correlation analysis of a sample from Dehradun (112). The correlation analysis again in this case was implied to examine the impact of one variable (Tolerance Level) on another (Perceived Pain) and to investigate the relationship two of the variables share. Pearson Correlation method plus two tailed test was brought in use in order to investigate the relationship. The data in the table above represents a very low positive correlation between the variables Tolerance Level and Perceived Pain which indicates that the level of tolerance has an impact on Perceived Pain or influences it in a positive manner. The significant value was at .014 which is less than 0.05 which indicates that it is significant statistically. Hence the hypothesis; There will be a significant relationship between Tolerance and Perceived Pain (H₂) gets accepted.

Discussion:

Tolerance is generally considered as an essential component of functioning democracy and stable world order. People have been debating over whether better tolerance level leads to better happiness levels or not? Alexander (2020) examined the impact of tolerance and stress on quality of life revealing that people who have better tolerance level experience less stress which further leads to a better life quality. Lower level of tolerance accounts for negative experiences which might further makes an individual prone to mental health conditions like anxiety and depression as highlighted by Felton et al. (2018) in their study on ‘Distress Tolerance Interacts with Negative Life Events to Predict Depressive Symptoms across Adolescence’.

The aim of the present study firstly, was to explore the impact of Tolerance level on Attention. The results indicated that Tolerance level has a positive impact on attention depicting a positive relationship between two of the variables. A low positive relationship between two variables can be decoded as the increase in the intensity of one variable will lead to increase in the intensity of the other variable as well, both the variables work in the same direction, the increase in the level of tolerance will lead to increased attention, the more is the tolerance level the more will the individual attend to the stimuli/stimulus or will pay attention to the stimuli more. The result is supported by one of the studies conducted by read & Loewenstein (2016) highlighting the positive associations between attention and tolerance in context of pain, participants with high tolerance were distracted during the task showed higher level of attention even after being distracted the painful experience

still was seen to grab the attention. The second focus of the study was to examine the impact of Tolerance level on perceived pain. The results pertaining to this case indicated that both the variables that are tolerance level a perceived pain share a very low positive relationship with each other which can further be elaborated as increase in the level of tolerance will lead to increased level of pain perception, the more is the tolerance level or the ability to tolerate in an individual more will the individual experience pain perception/perceived pain. The results in both the cases were seen to be standing in the direction they were expected to be in.

Conclusion:

The findings of the study explicitly indicate the low positive association between Tolerance Level and Attention. It can be inferred from the findings that the tolerance level of an individual has an impact on the attention in a positive manner, that is with increase in the level of tolerance the attention will also increase or be more or vice versa.

The other finding of the study is the very low positive association that was found between the variables Tolerance level and Perceived Pain which also indicates that the increase in the level of tolerance will lead to increased perceived pain/pain perception or vice versa respectively. The level of tolerance has been seen to be an essential skill for a better quality of life hence one should work towards increasing the tolerance level as it makes an individual resilient and less prone to psychopathologies.

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