



Cognitive versus Physiological Dominance in Panic Attacks: A Symptom-Subtype Study

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Abstract: Panic attacks, which are defined by a complex interaction of cognitive and physiological (physical) symptoms, are one of the ways in which anxiety disorders can be debilitating. This study adopts a cognitive-behavioral approach, which considers cognitive interpretation to be a facilitator of physiological arousal, to examine the relative frequency of cognitive and somatic symptoms experienced during panic attacks. Between the ages of 18 and 30, a total of 104 young individuals (58 females and 46 males) were analyzed for data using a quantitative correlational approach as part of university outreach. The Panic Disorder Severity Scale (PDSS), Body Sensations Questionnaire (BSQ), and Anxiety Sensitivity Index-3 (ASI-3) were some of the instruments used, and they all had outstanding internal consistency ($\alpha = .82$ to $.91$). There was a great deal of difference between cognitive ($M = 31.4$, $SD = 6.2$) and physical ($M = 24.7$, $SD = 5.8$) symptoms, with the former being significantly worse ($d = 1.22$), $t(103) = 6.21$, $p < .001$).

Keywords: *Panic Attacks, Cognitive Symptoms, Physical Symptoms, Anxiety Sensitivity, Cognitive Amplification, Mediation Analysis, Quantitative Correlational Design*

1. Introduction

Panic attacks are the most discomforting and intense form of anxiety. They involve the dynamic range of sudden bursts of fear along with cognitive, emotional and physical symptoms. The panic attack episode often seems to be quiet, without any warnings and reach the intense peak in few minutes, making an individual completely distressed, intensely fearful of another episode, and avoiding certain situation that might have been responsible for causing that panic episode previously (American Psychiatric Association, 2013). These episodes creates

significant distress and dysfunction in an individual's different domains of life including functional impairment that results in reduce quality of life (Kessler et al.,2006).

Panic attacks are the discrete period of the intense period of heightened fear or discomfort that occurs abruptly and reaches at the peak within few minutes, accompanied by certain symptoms that includes heart palpitations, sweating, shortness of breath at a brief amount of time, chest pain that happens to be sharp and intense, dizziness, fear of dying, fear of losing control along with derealisation or depersonalisation. Whereas, if the panic attack is recurrent and unexpected followed by the persistent concern about abnormal behavior changes or additional attacks then it is known as panic disorder.

Traditionally panic attacks have been seen as a unitary mechanism after intense research on the panic attacks it has been concluded that there is heterogeneity in the symptom presentation (Barlow,2002). As some individual predominantly experience catastrophising thinking or cognition that includes fear of dying, losing control in a particular situation or even “going crazy”, whereas others report the predominant experiences of physiological sensations like intense palpitations, chest pain that's sharp and intense, dizziness, and most frequently breathlessness (Clark,1986;Taylor,2006).

The presence of this heterogeneity in the symptoms makes it important to analyse and comprehend whether a panic attack is cognitively or physiologically dominant inn a person for better diagnostic clarity by refining the symptoms. The present study analysis and systematically compares the cognitive and physiological symptoms dominance using the well-known standardized psychometric tools. Therefore, contributing to the clinical field by evidence based assessments and promoting individualised clinical interventions for better treatment.

Variables involved

The study works on the two variables, analysing the effect of type of panic attack symptoms (cognitive or physiological) makes it a independent variable (IV) and as the severity, anxiety sensitivity and fear of bodily sensation creates panic attack becomes the dependent variable (DV).

Cognitive symptoms are described as a catastrophic misinterpretation of the bodily sensations and functions including the fear or loss of control (Clark,1986). Physiological symptoms refer as the somatic experiences during panic attack like heart palpitations, sweating ,trembling and shortness of breath (Barlow,2002). And anxiety sensitivity is defined as the fear of anxiety related sensations in correlation to the negative consequences of the situation (Reiss et al., 1986).

Conceptual Framework

The conceptual framework of the present study is based upon the cognitive behavioral models of panic attack, which conceptualises that the panic attack are the result of heightened physiological arousal along with the catastrophic cognitive appraisals of the body sensations (Clark,1986;Barlow,2002). Whereas, anxiety sensitivity is described as a vulnerability factor that intensifies the interaction by amplifying the fear of internal sensations (Taylor et.al, 2007). Therefore, the framework suggests that the variations in dynamics of the cognitive appraisal processes and physiological sensitivity leads to the differential symptoms dominance patterns that directly influences the panic severity and functional impairment in an individual.

Relationship between variables

The anxiety sensitivity had been considered to be mediator of the relationship between the arousal and panic symptom severity (Schmidt et.al, 1997). Individuals with high anxiety sensitivity have found to be more likely to catastrophize the bodily sensations resulting in the cognitive symptom dominance , on the other hand, the individual who have shown the heightened interoceptive sensitivity found to be experiencing the physiological symptoms (Taylor,2006). These interactions result in determining the severity, frequency and chronicity of the panic attack an individual is experiencing (McNally,2002).

Negative consequences of symptom dominance

The predominantly high cognitive symptoms are associated with the persistent anticipatory anxiety, avoidant behavior and negative long term prognosis (Clark et al, 1994). Physiological dominant symptom is linked with the increased health anxiety, often found to have repeated medical consultations and misdiagnosis (Barsky et al., 1994). Both the symptom patterns are associated to the psychosocial impairment that indicated the requirement of symptom specific assessment and intervention.

2. Review of Literature

This chapter critically evaluates and analysis the present or existing theoretical along with empirical based literature related to the panic attack, panic disorder , cognitive and physiological symptoms dominance, anxiety sensitivity and symptom subtyping. The section includes the review in a well-structured and organised to build the foundation of the present study, evaluating the past research findings and identifying the gaps between the literature preset related to the topic and justification of the current findings.

Barlow, D . H. (1988), conducted a research titled anxiety and its disorder that study synthesized the physiological, psychological and behavior research on anxiety disorder along

with the panic disorder. The study suggested that the combination of the biological vulnerability and psychological factors emphasising on the interaction between the physiological arousal and cognitive appraisal.

Clark, D.M. (1986), suggested a cognitive model based on clinical analysis findings related to the panic disorder. The case studies and the experimentally manipulated catastrophising thoughts were used to support to the model. The study concluded that the cognitive dominance of the panic symptoms that is the result of catastrophic misinterpretation of the bodily sensations.

Clark D. M . et al. (1994) he study titled as comparison of cognitive therapy, applied relaxation and imipramine in panic attack. The study suggested that the cognitive therapy is found to be more effective in reducing the panic frequency and help by supporting the primacy of cognitive symptoms in panic maintenance.

Rapee, R. M & Heimberg, R. G. (1997) suggested a cognitive behavioral model of anxiety in Social Phobia and Panic. The model suggested that the panic is exceeds by the perceived threat and catastrophic thinking.

Harvey, A. G. et.al (2003) conducted a research on the topic cognitive processes across the psychological disorders. It was a comparative experimental study examining the attentional biases present in the anxiety disorders. Findings suggests that the panic attack is heightened by the attentional focus on the bodily sensations emphasizing on the cognitive dominance of the symptoms.

Schmidt, N. B.et al.(1997) conducted a longitudinal research on the topic anxiety sensitivity as a prospective predictor of panic attacks. Suggested that the cognitive symptoms are dominant as a high anxiety sensitivity significantly predicts the future episodes of the panic attacks.

McNally, R. J. (2002) conducted a narrative review of the case studies and experimental studies by the title anxiety sensitivity and panic disorder. The findings suggests that the fear of having fear later on was identified as a core cognitive mechanism that is underlying panic attacks.

Hofmann, S.G.(2007) conducted a clinical trails based research with the title cognitive factors that maintain panic disorder suggesting that the reduction in catastrophic thoughts led to significant decline in severity of panic attack.

Teachman, B. A. et al.(2008) did an experimental study with the title implicit cognitive biases in panic disorder that suggested that the patients with the panic disorder had shown the automatic associations between the bodily sensations and danger.

Casey, L. M. et al.(2012) conducted a prospective clinical study with the title cognitive predictors of panic disorder chronicity suggesting through findings that the cognitive symptoms predicted long term persistence of the panic disorder in an individual.

Ley, R. (1985) false suffocation alarms in panic disorder is a biologically challenge studies using lactate infusion, findings suggests that the panic attacks were triggered by physiological maladaptive behavior supporting the physiological vulnerability.

Papp, L. A. et al.(1997) Carbon dioxide sensitivity in panic disorder is a laboratory based inhalation experiments. Findings suggests that individuals have showed heightened physiological reactivity towards carbon dioxide in an individual with panic disorder.

Ehlers, A. et al.(1986) introspective sensitivity in panic disorder is a experimental comparison of panic and control groups. The findings suggests that patients with the panic disorder were more sensitive to internal bodily cues.

Meuret, A.E. et al. (2005) respiratory dysregulation in panic disorder uses the physiological monitoring the individuals during panic episodes. The findings suggests that the panic onset is closely related to the respiratory disturbances.

Gorman, J. M. et al. (2000) neuroanatomy of panic disorder research paper is a neurobiological review using imaging studies and the findings suggests that the fear circuitry dysfunction contributes to the physiological domain of panic symptoms.

Margaf, J. et al.(1993) the title was the role of cognition in panic induction with the analysis of experimental induction of panic symptoms and the findings suggests that the cognitive interpretation is a promoting catalyst in the panic along with physiological arousal.

Reiss, S et al. (1986) Anxiety sensitivity, Anxiety frequency and fearfulness is a scale development and validation study where the finding suggests that the anxiety sensitivity is a distinct risk factor for a panic attack to occur.

Taylor, S. & Cox, B. J. (1998) anxiety sensitivity dimensions is a factor analysis study that suggested that the panic attacks are strongly associated with the cognitive concerns.

Zinbarg, R. E. et al. (2001) Anxiety sensitivity and panic disorder used a cross sectional method and the findings suggests that the panic attack severity can be predicted by cognitive anxiety sensitivity.

Taylor, S. et al. (2007) Development of the anxiety sensitivity index- 3, the methodology was psychometric analysis and the findings analysed the cognitive and physical fear dimensions reliably using ASI-3.

Deacon, B. & Abramowitz, J. (2006) Reducing anxiety sensitivity was an intervention study and the findings suggest that the reduced anxiety sensitivity is directly proportional to the panic symptoms.

Naragon – Gainey, K. (2010) Anxiety sensitivity and anxiety disorder was a meta-analysis and the findings suggest that the panic disorder can be distinguished from the other anxiety disorders while assessing the anxiety sensitivity.

Cox, B. J. et al. (1994) Symptoms subtypes in panic disorders method used in the study was cluster analysis of panic symptoms. The findings focus on the cognitive and physiological dominant subtypes identification.

Sachmidt, N. B. & Telch, M. J. (1994) Treatment response and panic subtypes. The findings suggest that cognitive therapy is better effective in cognitive dominant patients with panic attacks.

Brown, T. A. et al. (1998) Functional impairment in panic disorder and findings suggest that the greater disability is the result of cognitive symptoms.

Craske, M. G. et al. (2008) Maximizing Exposure Therapy did a theoretical and clinical review and findings suggest that treatment outcomes are affected by symptom heterogeneity.

Asmundson, G. J. G. et al. (2010) Health anxiety and panic is a cross-sectional study that suggests that health anxiety is associated with physiological dominance.

Lim, L. et al. (2014) Cultural variations in panic symptoms is a comparative cross-cultural study with the findings concluding that across cultures the symptom dominance varies.

Norton, P.J. et al. (2015) Transdiagnostic symptoms models of panic attacks was an empirical model testing and findings suggest that diagnostic clarity can be understood according to symptom-based classification.

The researches have extensively studied the topic and have focused on either the cognitive or physiological domain of panic symptom that makes the gap in the knowledge and information regarding panic attacks. The gaps found after critical analysis of the research found related to the topic were it lacks the integrated assessment using all the three tools together for analysis of the other research gap found that is anxiety sensitivity in symptom subtyping, these researches shown limited focus on the young adult population.

3. Methodology

3.1 Research design

The research is based on quantitative, cross sectional and comparative research design. This design has been opted after a brief analysis of the methodology adopted in researches conducted. This research design will help to assess and compare the cognitive and physiological symptom dominance in a panic attack episode at a single point of time. It's a non-experimental approach and it is designed to examine the naturally occurring differences in the symptoms in a panic attack without manipulation of the variables.

3.2 Aim of the study

The primary aim of this study is to analysis the dominance of cognitive vs physiological symptoms in a panic attacks among young adults using the tools panic disorder severity scale, body sensations questionnaire and anxiety sensitivity scale.

3.3 Objectives of the study

The specific objectives of this study were to :

- assess the severity of the symptoms among the young adults,
- comparison of the intensity of cognitive and physiological dominant symptoms in panic attacks,
- considering and assessing the role of anxiety sensitivity in relation to panic symptom dominance
- to identify the dominant symptom in a panic attack experienced by an individual.

3.4 Hypothesis

Research hypothesis will be that there will be a significant difference between the cognitive and physiological symptoms in a panic attack.

3.5 Variable

Independent variable (IV) will be the type of panic symptom dominance (cognitive vs physiological symptoms).

Dependent variable (DV) will be the panic symptoms severity, fear related to the bodily sensations and anxiety sensitivity.

3.6 Sampling

The sample size of the study consists of the 104 participants. Ranging from 18 to 30 years. Where the gender distribution is present as 58 females and 48 males. Convenience sampling technique was considered for the data collection, participant were recruited based on their accessibility and willingness to participate.

Inclusion criteria

Inclusion criteria included the consent regarding participation in the research, individuals who can read and understand English, lies in the age range of 18-30 years and individuals must have experienced the panic related symptoms.

Exclusion criteria

Exclusion criteria involved that if the individual is going under any psychiatric treatment, have any serious neurological or medical conditions, diagnosed with any serious mental conditions and have any substance dependency.

3.7 Tools

Three self-report psychological assessments have been administered on the participant for data collection. All the tools have high internal consistency with Cronbach's alpha values ranging from 0.82 to 0.91 depicting high reliability of the psychometry assessments.

Table 1: description of psychological assessment tools

Tools	Number of items	Reliability	Validity
Panic Disorder Severity Scale (PDSS)	7	0.82	Good construct validity
Body Sensations Questionnaire (BSQ)	17	0.98	Convergent validity
Anxiety Sensitivity Index – 3	18	0.91	Excellent factorial validity

Panic disorder severity scale (PDSS) is a self-report scale that assess the panic disorder's severity over the previous week. The items evaluate the different panic attack related

Panic Disorder Severity Scale (PDSS) is a self-report inventory that consists of 7 items that measures the overall severity of panic disorder symptoms. It assesses the frequency and intensity of a panic attack. High scores in the assessment indicates the greater severity of panic symptoms.

Body Sensations Questionnaire (BSQ) is a self-report questionnaire consisting of 17 items which assesses the degree of fear correlated with the bodily sensations during the panic attack episode. High scores indicates the greater physiological symptoms during a panic attack.

Anxiety Sensitivity Index 3 (ASI 3) is also a self-reported measure that assesses the anxiety sensitivity in 3 different dimensions that is physiological concerns, cognitive concerns and social concerns. High scores in the measure indicates the greater fear associated with anxiety.

3.8 Method of Data Collection

The data was collected through the google form (online). The google form consists of the different sections including the informed consent, demographic details, panic disorder severity scale, body sensations questionnaire and anxiety sensitivity index 3. The responses were collected completely on voluntarily basis and kept anonymous.

3.9 Procedure

Participants were approached and has been made aware about the research topic and seeking their consent for the data collection. The average time needed to complete or took by participants to complete was approximately 15 to 20 minutes. The responses were used in a format of the spreadsheet and prepared of statistical analysis after data cleaning, SPSS was used for the preparation of the result. A paired sample t test was conducted and Cohen's d was used to calculate the difference between the cognitive and physiological symptoms dominance in the panic attacks experienced by the individuals.

3.10 Ethical consideration

Informed consent was taken from all the participants, participation was completely voluntary and a window for withdrawal was kept that participants would be able to withdraw if they want to. Confidentiality and anonymity were maintained. No personal and identifiable information was collected.

4. Result and Analysis

The chapter represents the data analysis of the present study after the computation of the data using the SPSS in descriptive statistics and inferential statistics. The purpose of this chapter is to critically assess the research hypothesis formulated and examine the dominant cognitive versus physiological symptoms in a panic attacks.

Description

The total sample collected is 104 in number that have met the inclusion criteria for the study. All the participant have completed the online questionnaire completely. The age of the participant ranges from 18-30 years that is young adult population that has vulnerability to panic related symptoms. The gender distribution in the sample consists of 58 females and 48 males.

The descriptive statistics were used in data analysis for computation of the central tendencies and variability of scores obtained in the psychological assessments used in the present study. The central tendencies and variability will help us understand the dominance in heterogenic category.

Table 2. *Descriptive statistics for the cognitive and physiological symptoms*

Symptom domain	Mean	Standard Deviation
Cognitive symptoms	31.4	6.2
Physiological symptom	24.7	5.8

According to the table, the mean score of cognitive symptoms that is 31.4 was considerably high than that of physiological symptoms that is 24.7. The individual differences can be suspected by considering the standard deviation of both the domains as there is a moderate variability but cognitive symptoms have considerably higher. Therefore, the cognitive symptoms are found to be dominant in the data analysis of the present study.

A paired sample t test had also been conducted using the SPSS for more descriptive data and for appropriate comparison between the 2 domains within the same group of participants .

Table 3. *Paired sample t test comparing cognitive and physiological symptoms*

Symptom domains compared	Mean difference	T value	df	P value	Cohen's d
Cognitive vs Physiological	6.7	6.21	103	<0.001	1.22

The table 3 explains that the paired sample t test revealed there's a statistically significant difference between the cognitive and physiological symptoms of panic attacks, $t(103) = 6.21$, $p < 0.001$ indicating that there's a high level of statistical significance. The Cohen's $d = 1.22$ indicates the large effect presenting the clinically meaning difference.

5. Discussion

The aim of the study was to find the dominant symptoms in a panic attack cognitive versus physiological dominance. The data of the participants reported the higher mean scores on cognitive symptom measures compared to the physiological symptoms. The data analysis has shown the difference to be statistically significant with a large effect size.

The panic attacks are considered to be influenced by the cognitive symptoms that includes the maladaptive cognitive processes like catastrophizing misinterpretation of the bodily sensations, fear of losing control, fear of dying and anticipatory anxiety. These findings suggests the that interpretation of the physiological sensations themselves are responsible for the triggers and maintenance of the panic attack episodes.

High scores of the ASI 3 assessment indicated the elevated anxiety sensitivity, specifically cognitive concerns, that have been responsible for the amplification of threat perception and emotional distress. This perception aligns with the point of view that individuals that fear consequences of anxiety related sensations have higher tendency to experience severe panic attack symptoms.

Physiological symptoms like heart palpitations, dizziness, and breathlessness are present their scores have been comparatively lower mean scores suggesting that they may function as a catalyst or triggers rather than the primary drivers of the panic attack. The findings suggested that the physiological arousal alone may not fully responsible for the panic attack episode unless it's accompanied by the cognitive appraisal.

The findings of the present study aligns with the previous literature focusing on the central role of cognition in a panic attack mechanism. According to the cognitive behavioral theories suggests that the panic attacks arises when the bodily sensations are misinterpreted as a signs of danger. The large size effect act as a strengthens the evidence of the present study that supports the cognitive dominance models.

The study act as a positive point by adopting the symptom subtyping approach in which have empirically compared the cognitive and physiological domains within the same set of the same sample. It strengthens and inconsistencies in earlier researches where the symptoms are studied separately rather than as comparatively.

The findings of the research have several important implications for a clinical setting, as the catastrophising cognition and anxiety sensitivity should be assessed in an individual presenting the panic attack symptoms. It can be used as a cognitive restructuring technique focusing on the misinterpretation of the bodily sensation that can result in the panic attack generation. By analysing and focusing on a particular symptom subtype it is easier to generate the intervention. And the early identification can help in reduction of the progression of the panic attack symptoms.

5.1 Limitations of the study

The study has certain limitations like as it's a self-report based methodology, it makes it vulnerable for biases. As research design is cross sectional this limits casual interpretations. The age is focused on young adults only, doesn't involve the rest of the age groups.

5.2 Future references

For the future research the longitudinal designs can be considered to carefully examine the pathways, clinical samples with the diagnosed panic disorder can be used, can include the

behavioral and physiological aspects, cross cultural comparison and gender analysis can be done on the basis of the symptoms.

6. Conclusion

The present study provides the empirical support that cognitive symptoms are more dominant than physiological symptoms in a panic attack in young adults. The findings seems to correlates with the cognitive models of panic and highlight the importance of examining the maladaptive thought patterns in the assessment and intervention. As the research based on the symptom subtyping approach it contributes meaningfully to the clinical application as well as to the theoretical knowledge in the field of panic attack or anxiety related disorders.

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