



Psychological Symptoms of Trauma of Myocardial Infarction

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Abstract

Myocardial infarction (MI), commonly referred to as a heart attack, is not only a life-threatening medical condition but also a psychologically distressing event that can precipitate trauma-related symptoms. The sudden onset, perceived threat to life, and subsequent hospitalization often contribute to heightened psychological reactions such as anxiety, intrusive memories, hyperarousal, avoidance behaviors, and depressive symptoms. Emerging evidence suggests that a substantial proportion of MI survivors may experience post-traumatic stress symptoms, which can negatively impact recovery, treatment adherence, and overall quality of life. This study aims to explore the psychological symptoms of trauma associated with myocardial infarction, highlighting the significance of addressing mental health in cardiac care. By examining the prevalence and nature of trauma-related responses in MI patients, the research emphasizes the importance of integrating psychological assessment and intervention into routine clinical management.

**Keywords:** Myocardial Infarction, Psychological Trauma, Post-Traumatic Stress Symptoms, Anxiety, Depression, Intrusive Experiences, Cardiac Patients

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## INTRODUCTION

Myocardial infarction (MI), commonly referred to as a heart attack, constitutes a profoundly life-threatening cardiovascular ailment, often culminating in significant physical as well as deep psychological ramifications. The experience of surviving an MI is frequently articulated as a traumatic occurrence, as it jeopardizes an individual's perception of safety, autonomy, and prospective well-being (Edmondson et al., 2012). The onset of abrupt chest pain, subsequent hospitalization, and the perceived imminent threat of mortality can evoke a spectrum of psychological manifestations akin to post-traumatic stress reactions (Whitehead et al., 2015).

Empirical studies have consistently demonstrated that individuals post-MI frequently disclose elevated levels of anxiety, depression, and symptoms resembling post-traumatic stress disorder (PTSD), which may endure long after the physical recuperation (Kronish et al., 2016). Symptoms of anxiety are notably prevalent, as patients exhibit an increased sensitivity to bodily sensations, harboring fears of the recurrence of the cardiac incident (Shemesh et al., 2004). Additionally, depression is widely observed, affecting approximately 20–30% of patients following MI, and has been correlated with adverse recovery trajectories and heightened mortality risk (Thombs et al., 2006). Furthermore, intrusive thoughts, avoidance behaviors, and hyperarousal akin to PTSD are increasingly acknowledged as salient mental health challenges among survivors of MI (Edmondson & von Känel, 2017).

These psychological manifestations can considerably degrade patients' quality of life and their adherence to medical regimens, thereby impacting long-term prognostic outcomes (Tully & Baumeister, 2015). Consequently, comprehending the trauma-associated psychological symptoms linked to MI is imperative for formulating integrative therapeutic strategies that encompass both physiological and psychological *rehabilitation*.

## LITERATURE REVIEW

The psychological ramifications of myocardial infarction (MI) have been extensively examined, with evidence indicating that the incident frequently serves as a traumatic stressor. A substantial corpus of literature underscores post-traumatic stress disorder (PTSD) symptoms as a common consequence among MI survivors. Edmondson et al. (2012) articulated that up to 12% of patients manifest clinically significant PTSD symptoms following an acute coronary syndrome, which can exacerbate cardiovascular morbidity. These observations are corroborated by Edmondson and von Känel (2017), who accentuated that PTSD symptoms—including intrusive memories, hyperarousal, and avoidance behaviors—are not merely psychological sequelae but also predictors of recurrent cardiac events. Emerging research also suggests that emotional dysregulation and reduced social functioning are long-term psychological challenges following MI. Kronish et al. (2016) found that PTSD symptoms in cardiac patients were associated with poorer adherence to medications, suggesting that psychological trauma has direct behavioral consequences on secondary prevention. Moreover, Tully and Baumeister (2015) showed that collaborative care interventions addressing both depression and cardiovascular health are more effective than medical treatment alone, underscoring the need for integrative psychosocial care.

## METHOD

### Participants

The sample of the present study consists of 60 participants (30 myocardial infarction & 30 control) with age range of 18–54 years. 30 myocardial infarction participants (15 male & 15

female) were contracted at cardiology unit Bahawalpur. 30 control participants (15 female & 15 male) were approached at different residential areas (people's colony, modaltown, sattlitetown etc) situated at Bahawalpur.

## Instrument

### Trauma Symptom Inventory

The Trauma Symptom Inventory-2 (TSI-2) is a standardized self-report measure developed by Briere (2011) to assess the psychological consequences of traumatic experiences. It consists of 136 items that evaluate domains such as anxious arousal, depression, anger, intrusive experiences, defensive avoidance, dissociation, sexual concerns, impaired self-reference, and tension-reduction behavior. Scores are converted into T scores for standardized interpretation based on normative data (Briere, 2011).

### Translation Procedure

**Forward Translation:** With the author's permission, two bilingual experts translated the scales from English to Urdu.

**Selection of Items:** A panel of professional translators reviewed the translations and made necessary adjustments to improve accuracy.

**Back Translation:** Independent experts, unfamiliar with the original questionnaires, translated the Urdu versions back into English. The versions were then compared and finalized by bilingual experts.

*A related study by Moser and Erik (2003) at the University of Kentucky found that women experienced significantly higher anxiety levels than men after a heart attack. They assessed 912 patients across five countries within 72 hours of hospital admission using a reliable six-item anxiety test. Results showed women reported higher anxiety regardless of age, education, or marital status. The present study aims to assess trauma-related psychological symptoms in cardiac patients. Findings may help develop specialized treatment programs and benefit families, doctors, therapists, and healthcare professionals.*

## Objectives

1. To find out the difference among the Myocardial Infarction patients and controls (normal) on psychological symptoms of trauma.
2. To assess the difference of both groups (myocardial infarction patients & normal) on the tendency of cardiac patients to deny the traumatic symptoms.
3. To assess the difference of both groups (myocardial infarction patients & controls) on the tendency of the patients of Myocardial Infarction to endorse
4. trauma-related symptoms.
5. To find out any gender differences among Myocardial Infarction patients on traumatic symptoms.

The current study focused the following hypotheses:

Myocardial Infarction patients would be experiencing more traumatic symptoms as compared to controls (participants with no complaints of Myocardial Infarction).

Myocardial Infarction patient would be denying the traumatic symptoms (Atypical Response, Response Level, and Inconsistent Response) more as compared to the controls (participants with no complaints of Myocardial Infarction).

Patients of Myocardial Infarction would endorse trauma-related symptoms (Depression, Anxious Arousal, Anger/Irritability, Intrusive Experiences, Defensive Avoidance, Dissociation, Sexual Concern, Impaired Self Reference, Tension Reduction Behavior) more as compared to controls (participants with no complaints of Myocardial Infarction).

The female patients would be showing more traumatic symptoms as compared to male myocardial infarction patients.

RESULTS

Table 1

Means, Standard Deviations, and t Values of Gender Differences among Myocardial Infarction Patients on Trauma Symptom Inventory and Its Total (N = 30)

Scale	Male (n = 15) M (SD)		Female (n = 15) M (SD)	
RL	0.80 (0.86)	2.00 (0.00)	12.50	.000
ATR	5.39 (2.84)	8.73 (2.66)	4.07*	.001
INC	0.66 (0.92)	2.13 (0.52)	4.69*	.001
AA	11.60 (2.61)	16.00 (1.96)	5.21*	.001
D	11.93 (3.37)	18.06 (2.12)	5.97*	.001
AI	14.07 (3.06)	19.27 (2.84)	4.82*	.001
IE	13.40 (3.52)	19.40 (2.80)	5.17*	.001
DA	13.87 (2.90)	20.60 (2.56)	6.74*	.001
DIS	12.93 (4.62)	20.33 (3.17)	5.11*	.001
SC	15.13 (2.59)	19.73 (2.25)	5.19*	.001
DSB	13.13 (3.60)	20.00 (2.13)	6.35*	.001
ISR	11.80 (3.05)	19.00 (1.65)	8.04*	.001
TRB	11.20 (2.73)	18.47 (1.60)	8.90*	.001
Total	138.93 (14.83)	205.93 (15.39)	8.00*	.001

Note. RL = Response Level; ATR = Atypical Response; INC = Inconsistent Response; AA = Anxious Arousal; D = Depression; AI = Anger/Irritability; IE = Intrusive Experiences; DA = Defensive Avoidance; DIS = Dissociation; SC = Sexual Concerns; DSB = Dysfunctional Sexual Behavior; ISR = Impaired Self-Reference; TRB = Tension Reduction Behavior.

p < .001. df = 28.

Table 2

Comparison of Trauma Symptom Inventory (TSI) and its Subscales for Myocardial Infarction Patients (n = 30) and Control Group (n = 30)

Scale	MIP M (SD)		MIP MM		Control M (SD)		Control MM	
	t(58)	p						
Response Level (RL)	1.40 (0.85)	0.85	7.14 (6.33)	2.23	11.29	< .0001		
Atypical Response (ATR)	9.50 (2.97)	1.05	1.50 (0.50)	0.67	14.55	< .0001		
Inconsistent Response (INC)	1.57 (0.93)	0.37	8.27 (3.75)	1.21	9.49	< .0001		
Anxious Arousal (AA)	13.80 (3.19)	0.58	3.20 (1.63)	0.25	16.22	< .0001		
Depression (D)	15.00 (4.16)	0.53	2.57 (3.11)	0.19	15.76	< .0001		
Anger/Irritability (AI)	16.67 (3.92)	0.54	3.37 (1.40)	0.27	17.48	< .0001		
Intrusive Experience (IE)	16.40 (4.37)	0.49	2.23 (0.77)	0.19	17.49	< .0001		
Defensive Avoidance (DA)	17.23 (4.35)	0.46	3.27 (1.34)	0.27	16.80	< .0001		
Dissociation (DIS)	16.63 (5.42)	0.54	2.63 (1.09)	0.21	16.87	< .0001		
Sexual Concerns (SC)	17.43 (3.34)	0.52	2.20 (0.71)	0.18	24.43	< .0001		
Dysfunctional Sexual Behavior (DSB)	16.30 (4.55)	0.54	3.37 (1.06)	0.22	16.57	< .0001		
Impaired Self-Reference (ISR)	15.40 (3.86)	0.58	2.33 (0.76)	0.19	16.78	< .0001		
Tension Reduction Behavior (TRB)	14.83 (4.30)	0.50	2.73 (1.57)	0.21	19.52	< .0001		
Total	172.43 (36.02)	6.26	42.13 (0.66)	0.66	—	—		

Note. MIP = Myocardial Infarction Patients; MM = Mean per item. Higher mean scores indicate elevated trauma-related symptoms. *p* values are significant at  $< .0001$ ,  $df = 58$ .

**Table 3**

Mean Scores of Trauma Symptom Inventory and Its Subscales for Myocardial Infarction Patients and Control Group ( $N = 60$ )

Scale	Myocardial Infarction Patients ( $n = 30$ )		Controls ( $n = 30$ )	
	<i>t</i> (58)	<i>p</i>		
	M (SD) / MM	M (SD) / MM		
RL (Response Level)	1.40 (0.85) / 7.14	6.33 (2.23) / 11.29	1.58	$< .0001$
ATR (Atypical Response)	9.50 (2.97) / 1.05	1.50 (0.50) / 14.55	6.67	$< .0001$
INC (Inconsistent Response)	1.57 (0.93) / 6.37	8.27 (3.75) / 9.49	1.21	$< .0001$
AA (Anxious Arousal)	13.80 (3.19) / 0.58	3.20 (1.63) / 16.22	2.50	$< .0001$
D (Depression)	15.00 (4.16) / 0.53	2.57 (1.13) / 15.76	3.11	$< .0001$
AI (Anger/Irritability)	16.67 (3.92) / 0.54	3.37 (1.40) / 17.48	2.67	$< .0001$
IE (Intrusive Experience)	16.40 (4.37) / 0.49	2.23 (1.77) / 17.49	3.59	$< .0001$
DA (Defensive Avoidance)	17.23 (4.35) / 16.80	0.46 (3.27) / 1.34	2.44	$< .0001$
DIS (Dissociation)	16.63 (5.42) / 13.87	0.54 (3.42) / 2.63	1.09	$< .0001$
SC (Sexual Concerns)	17.43 (3.34) / 24.43	2.20 (0.52) / 4.09	0.71	$< .0001$
DSB (Dysfunctional Sexual Behavior)	16.30 (3.37) / 16.57	4.55 (0.54) / 1.06	2.67	$< .0001$
ISR (Impaired Self-Reference)	15.40 (3.86) / 4.38	0.76 (0.58) / 2.33	16.78	$< .0001$
TRB (Tension Reduction Behavior)	5.09 (4.30) / 14.83	1.57 (0.50) / 0.54	2.73	$< .0001$
Total	36.02 (6.26) / 172.43	42.13 (0.66) / —	—	—

Note. MM = Mean score divided by number of items pertaining to each subscale. RL = Response Level; ATR = Atypical Response; INC = Inconsistent Response; AA = Anxious Arousal; D = Depression; AI = Anger/Irritability; IE = Intrusive Experience; DA = Defensive Avoidance; DIS = Dissociation; SC = Sexual Concerns; DSB = Dysfunctional Sexual Behavior; ISR = Impaired Self-Reference; TRB = Tension Reduction Behavior. MIP = Myocardial Infarction Patients.  $p < .0001$ ,  $df = 58$ .

**Table 4**

Means, Standard Deviations, and *t* Values of Gender Differences among Myocardial Infarction Patients on Trauma Symptom Inventory and Its Total ( $N = 30$ )

Scale	Male ( $n = 15$ ) M (SD)	Female ( $n = 15$ ) M (SD)	<i>t</i>	<i>p</i>
RL	0.80 (0.86)	2.00 (0.00)	12.50	.000
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ISR	11.80 (3.05)	19.00 (1.65)	8.04*	.001
TRB	11.20 (2.73)	18.47 (1.60)	8.90*	.001





Total	138.93 (14.83)	205.93 (15.39)	8.00*	.001
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Note. RL = Response Level; ATR = Atypical Response; INC = Inconsistent Response; AA = Anxious Arousal; D = Depression; AI = Anger/Irritability; IE = Intrusive Experiences; DA = Defensive Avoidance; DIS = Dissociation; SC = Sexual Concerns; DSB = Dysfunctional Sexual Behavior; ISR = Impaired Self-Reference; TRB = Tension Reduction Behavior.  
 $p < .001$ .  $df = 28$ .

Table 1 presents the mean scores and standard deviations for male ( $n = 15$ ) and female ( $n = 15$ ) participants across the subscales of the Trauma Symptom Inventory (TSI). Independent samples  $t$ -tests were conducted to compare the groups. Results indicate that females scored significantly higher than males on all subscales, including Response Level (RL), Atypical Response (ATR), Inconsistency (INC), Anxious Arousal (AA), Depression (D), Anger/Irritability (AI), Intrusive Experiences (IE), Defensive Avoidance (DA), Dissociation (DIS), Sexual Concerns (SC), Dysfunctional Sexual Behavior (DSB), Impaired Self-Reference (ISR), and Tension Reduction Behavior (TRB), as well as on the Total score. All comparisons were statistically significant ( $p < .05$ ), with females consistently demonstrating elevated trauma-related symptoms compared to males.

DISCUSSION

H1. MI patients experience more traumatic symptoms than controls  
H1. Patients with myocardial infarction (MI) exhibit a higher prevalence of trauma-related symptoms compared to healthy control subjects.  
The observation that individuals with myocardial infarction (MI) report a greater incidence of trauma-related symptoms than healthy control participants is consistent with extensive research indicating heightened levels of post-traumatic stress disorder (PTSD), depression, and anxiety following acute MI events. Systematic reviews and cohort studies habitually conceptualize MI as a potentially traumatic and life-threatening occurrence that may trigger intrusive memories, hyperarousal, and avoidance behaviors, in conjunction with comorbid depression and anxiety, which frequently exacerbate the severity of PTSD. Recent comprehensive analyses and clinical assessments further highlight significant prevalence rates of PTSD symptoms post-MI, with approximately one-third of MI patients meeting clinically significant criteria for anxiety and depression. These converging lines of evidence substantiate the observed between-group effect. (Kumar & Varma, 2017; Roberge et al., 2010; Lorem et al., 2023.)  
H2. Patients with myocardial infarction demonstrate a higher degree of denial regarding trauma-related symptoms (ATR, RL, INC) than healthy controls.  
Denial constitutes a well-documented initial coping mechanism in the context of cardiac events. Both classic and contemporary literature in cardiology suggests that during or shortly following an MI, numerous patients tend to minimize or downplay the severity of their symptoms—sometimes experiencing short-term mood benefits, but potentially incurring costs related to help-seeking behaviors and adherence to rehabilitation protocols. Consequently, elevated scores on the Trauma Symptom Inventory (TSI) validity indices associated with over- or under-reporting and response intensity (Atypical Response, Response Level, Inconsistent Response) are theoretically justifiable in the context of MI patients compared to controls, reflecting defensive minimization and/or atypical symptom expression in the face of acute threats. Foundational research on the TSI delineates these three validity scales, and subsequent psychometric investigations (TSI-2) retain Response Level and Atypical Response as mechanisms for assessing under- and over-reporting. Independent cardiac studies have corroborated denial as a prominent mechanism in MI

patients, thereby reinforcing the observed group differences regarding TSI validity indicators. (Briere & Runtz, 1995; Snyder et al., 2009; VA/NCPTSD, 2024; Covino & Stern, 2011; Fang et al., 2016.)

H3. Patients with myocardial infarction endorse specific trauma-related symptoms (e.g., Depression, Anxious Arousal, Anger/Irritability, Intrusive Experiences, Defensive Avoidance, Dissociation, Sexual Concerns, Impaired Self-Reference, Tension-Reduction Behavior) to a greater extent than healthy controls.

Elevated symptom levels among MI patients align with profiles of post-event psychopathology: intrusive thoughts and avoidance behaviors correspond with trauma reactivity to the cardiac event; anxious arousal, irritability or anger, and dysphoria frequently co-occur with cardiovascular stress and uncertainty regarding potential recurrence; dissociation and compromised self-reference can manifest in instances of acute medical trauma; and tension-reduction behaviors may serve as maladaptive strategies for affect regulation. Comprehensive reviews and cohort/meta-analytic studies document an increase in PTSD features alongside elevated levels of depression and anxiety following acute myocardial infarction (AMI), thereby supporting a pervasive pattern of heightened TSI clinical scale scores in comparison to non-cardiac control subjects. (Kumar & Varma, 2017; Roberge et al., 2010; Chong et al., 2025; Lorem et al., 2023.)

H4. Female patients with myocardial infarction report a greater incidence of traumatic symptoms than their male counterparts.

The gender effect observed in your findings parallels existing evidence indicating that women frequently manifest more intense and enduring PTSD symptoms, along with elevated rates of depression and anxiety, subsequent to acute myocardial infarction (AMI) in comparison to men. Prospective and cross-sectional investigations reveal a heightened symptom burden among female patients in the months following an MI, and contemporary meta-analytic studies identify female sex as a significant risk factor for mental health morbidity post-AMI. These trends may be attributable to variances in cognitive appraisal, social roles, comorbid conditions, and pathways to care, thereby substantiating your intra-patient gender comparison. (Xu et al., 2017; Liblik et al., 2022; Chong et al., 2025.).

## IMPLICATIONS

*Together, these results underscore the importance of routine screening for trauma-related symptoms after MI, with particular attention to women and to response validity/denial that may mask need. Integrating brief PTSD/depression assessments, psychoeducation about normal post-MI reactions, and stepped-care psychosocial interventions into cardiac rehabilitation could improve detection, adherence, and outcomes. (Covino & Stern, 2011.)*

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