

EXAMINING SENSE OF COHERENCE AMONG VICTIMS OF SUICIDE BOMBING: THE MODERATING ROLE OF TRAIT AND STATE RESILIENCE

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The present study is based on the Theory of Sense of Coherence. Sense of coherence is the ability of individuals to cope with stress and ensure health during traumatic life incidents. The study examined the moderating role of resilience between sense of coherence and psychological problems including depression, anxiety, stress and PTSD among the victims of suicide bombing. Moderating effect of the domains of resilience including trait and state resilience was also examined. The study comprised of a purposive sample of the victims of suicide bombing ($N = 300$) with age ranges from 30 to 45 years ($M = 12.23$, $SD = 6.73$) further divided along gender lines. Data was taken using Sense of Coherence Scale, Trait-State Resilience Inventory, Depression Anxiety Stress Scale and Impact of Events Scale. Hierarchical regression revealed that resilience significantly moderated the relationship between sense of coherence and psychological problems including depression, anxiety and stress among victims of suicide bombing. More specifically, resilience moderated between sense of coherence and PTSD among victims of suicide bombing. Trait and state resilience also moderated between sense of coherence and psychological problems among victims of suicide bombing. Similarly, trait and state resilience also moderated between sense of coherence and PTSD. The study confirmed that the interacting effect of the sense of coherence and resilience on reducing psychological disorders resulted from a severe traumatic experience. The study also shed light on the dual functions of resilience—an ability to recover from trauma and stressful incidents of life. Along with sense of coherence, the moderating effect of resilience inbuilt in an individual's personality (trait resilience) as well as the resilience gained to respond to a trauma (state resilience) remained helpful in reducing the resultant psychological disorders emerging as an aftermath of becoming victims of suicide bombings in Pakistan.

Keywords: Sense of coherence, resilience, trait resilience, state resilience, suicide bombing

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Suicide bombing in Pakistan has had a direct impact on the physical, social and *mental health* of the survivors (Nasim, Khan, & Aziz, 2014). The term *Salutogenesis* is the brainchild of the medical sociologist Aaron Antonovsky. The *Salutogenetic Perspective* focused on ensuring health in the society, rather than examining the factors which lead towards disease. The interrelationship between health, stress and coping is the major concern of *salutogenic model*. Antonovsky (1987) coined the term "*health-ease versus dis-ease continuum*" in order to describe the health and recovering from illness along a continuum by rejecting the health and illness dichotomy of traditional medical professionals. Thus simultaneously, an individual attempts to ensure health and copes with stress and stressors. The word *autogenesis* is derived from the combination of two words taken from Greek and Latin language including *salus* and *genesis* respectively. *Salus* means health and *genesis* means origin. Thus the origins of health are focused in this model (Antonovsky, 1998).

A sense of coherence leads towards numerous health outcomes among normal groups and mental health patients at the same time (Antonovsky, 1987). Besides normal populations, sense of coherence is clinically significant. Antonovsky (1979) stated that it is clinically substantial to develop the high and powerful sense of coherence specifically in disaster victims to decrease risk factors of psychiatric problems like depression, anxiety and stress as well as PTSD. However, instead of focusing on disasters and other traumatic samples, most of the researchers targeted normal samples (Richardson & Ratner, 2015; Fok, Chair, & Lopez, 2016) and ignored disaster and trauma-survivors. One of the major reasons is that, most of the research was conducted in consumerist and technologically advanced nations, which either faced relatively less disasters as compared to Asian countries or the consequences of these disasters were less severe due to prompt rehabilitations. In this regard, the future researchers should take disaster victims into consideration. The concept of sense of coherence itself stems from the experiences of man-made disaster. More specifically, incorporating resilience in countering the effects of disasters through sense of coherence can be more beneficial (Antonovsky, 1979).

Resilience is a process comprising of healthy and positive adaptation mechanisms in adverse scenarios. Resilience makes a valuable contribution in enhancing health and well-being. Resilience can also be utilized as an effective intervention for the treatment of stress and related pathologies. Resilience takes two forms which can be either present since childhood or may be a part of the current dominant states that help individuals face stressors. The preceding is labeled as trait resilience and the latter is labeled as state resilience (Luthar, Cicchetti, & Becker, 2000; Bonanno, 2004; Hiew, Mori, Shimizu & Tominaga, 2000; Johnson, Gooding, Wood & Tarrier, 2010). Hiew illustrates that resilient people in the face of adversity remained healthy and refreshed if they demonstrated letting go of stressful responses. Resilience can be restored by switching out from stress provoking thoughts and overwhelming traumatic memories (Hiew, 2004).

In health-disease, care-cure and prevention-intervention continuum, sense of coherence focuses on health, care and prevention which ensures strategic health gains in the long run (Griffiths, 2008; Holmberg, Thelin, & Stiernstrom, 2004). Studies from Pakistan (Riaz, Riaz, & Batool, 2014; Riaz et al., 2015) confirmed that victims of man-made disasters face more severe consequences as compared to the victims of natural disaster. More specifically, Riaz et al. (2015) compared flood, terrorism and suicide bombing victims and found that the victims of suicide bombing face even more severe consequences in the form of depression and PTSD as compared to victims of terrorism. Thus besides the suggestion of Antonovsky (1979) regarding the relevance of the sense of coherence for man-made disasters, the victims of suicide bombings are the most severely affected disaster victims. Thus in order to bridge this gap, the present study focused on the moderating role of state and trait resilience in the relationship between sense of coherence and health outcomes in the form of depression, anxiety, stress and PTSD among victims of suicide bombing.

Hypotheses

1. Trait resilience, state resilience and overall resilience will moderate the relationship between sense of coherence and PTSD among victims of suicide bombing
2. Trait resilience, state resilience and overall resilience will moderate the relationship between sense of coherence and depression among victims of suicide bombing.
3. Trait resilience, state resilience and overall resilience will moderate the relationship between sense of coherence and anxiety among victims of suicide bombing.
4. Trait resilience, state resilience and overall resilience will moderate the relationship between sense of coherence and stress among victims of suicide bombing.

Method

The study has mainly focused on the moderating effect of resilience including trait and state between sense of coherence and mental health related consequences among victims of suicide bombing in Pakistan.

Participants

The study used a cross-sectional design for collecting data from the lineage of the victims of suicide bombing in Pakistan ($N = 300$) with age range from 32 to 45 years ($M = 23.87$, $SD = 7.73$). Purposive sampling was the major strategy for data collection in four cities including Islamabad, Sargodha, Lahore and Peshawar. The researchers collected the data with predefined inclusion-exclusion criteria which served the purpose of study. Inclusion criteria was related to the direct experience of suicide bombing, sustaining injuries and the time of that tragic incident being more than 6 months (as a requirement to collect information related to PTSD). The remaining victims of suicide bombing were not included who were deficient even in a single domain of the above mentioned inclusion criteria. Thus victims—having exposure to suicide bombing but not experiencing it, sustaining no injury from suicide bombing incident and not meeting the criteria for PTSD—were excluded from the sample (as per exclusion criteria). The

data was further divided along gender lines as male ($n = 65, 87\%$) and female victims ($n = 65, 87\%$) participated in the study. Further information related to the family system of victims was also collected as the victims belonged to nuclear ($n = 65, 87\%$) and extended families ($n = 65, 87\%$). Written informed consent was taken from all participants.

Measures

Following measures were used in the current study:

Sense of Coherence Scale (SCS). The first scale was the 13-items Sense of Coherence Scale (Antonovsky, 1993) which was used for measuring sense of coherence. The scale is further divided into 3 subscales including manageability, comprehensibility and meaningfulness. The items were positively worded that were rated on 6-point Likert-type scale with 1 = *very seldom* and 6 = *very often*. The minimum scores on the scale were computed as 13 whereas the maximum were 68. Low-high scores were taken to examine the low and high level of sense of coherence among victims. Reliability of the original scale is .96 which represented high internal consistency. Existing research confirmed that SCS is a reliable and valid measure of coherence in indigenous context (Shaheen, 2016). The scale was translated in Urdu by the researcher.

Trait-State Resilience Inventory (TSRI). The TSRI was developed by Hiew (2003) and translated in Urdu by Sarwar (2005). It is a 33 items scale with two subscales measuring trait resilience with 18 items and state resilience with 15 items. There are no reverse items in the scale and all items are rated on 5-point Likert-type response format with 1 = *strongly disagree* to 5 = *strongly agree*. The 15-75 and 18-90 are minimum and maximum scores for state and trait resilience respectively. Low and high scores were interpreted as low and high level of resilience respectively. Reliability of the original scale is reported as .87 for trait resilience and .82 for state resilience. Existing empirical studies conducted by using this scale reported it as a reliable and valid measure of multidimensional resilience (Qudsia, 2015; Riaz, Riaz & Batool, 2014).

Depression, Anxiety, Stress Scale (DASS-21). In the present study, DASS was used to measure depression, anxiety and stress among victims of suicide bombing. The scale was developed by Lovibond and Lovibond (1995). The scale was translated in Urdu by Aslam (2007). The scale comprised of 21 items and 3 subscales. Each subscale consisted of 7 items. All items are positively worded and there is no reverse item in the scale. The scale is based on a four point Likert scale. Response categories range from 0 = *never* to 3 = *always*. The scores were interpreted as low and high scores measuring low and high level of depression, anxiety and stress among victims of suicide bombing. Minimum scores on a single subscale are 0 whereas maximum scores can be 21. Reliability of the original scale is reported as .98, .92 and .90 for depression, anxiety and stress respectively. Past research indicates that it is a reliable and valid measure of depression, anxiety and stress among victims of suicide bombing (Mujeeb, 2009; Riaz, et al., 2015).

Impact of Events Scale (IES). The IES was developed by Horowitz, Wilner & Alvarez (1979) and Urdu translated by Aslam (2007). It is 15-items scale in which all questions are positively worded. The questions are scored on 4-point Likert-type response pattern in which 0 = *not at all* to 3 = *often*. The scale measures symptoms of PTSD. The scores were interpreted as low and high scores representing low and high level of the symptoms of PTSD respectively. Minimum scores on a single subscale are 0 whereas maximum scores can be 45. Reliability of the original scale is reported as .92. Past research indicates that it is a reliable and valid measure of PTSD among victims of suicide bombing (Aslam, 2007; Faiza & Anila, 2017).

Procedure

The study has mainly followed the non-probability data collection technique of purposive sampling. Major data collection was completed in three cities of Pakistan including Sargodha, Lahore and Peshawar. Information regarding statistics of different suicide bombing incidents and affected individuals (hospitalized due to physical injuries, disabilities due to blasts, under surgical operations) was obtained from law enforcement agencies in

general and the police department in particular. Initially incidences of suicide bombing were identified through newspapers. Then the nearby police stations involved in the rescue operation were identified and they were requested to provide further information regarding the victims. In few cases the military personnel involved in the rescue operations were also requested to provided the information regarding the victims. The data was collected from hospitals as well as residential areas. However, in all departments, the officials provided information conditionally by making sure that neither their identities will be disclosed nor data will be used for other than research purpose. Even at this stage, most of the officials were scared to share information due to the sensitivity of the issue in general and because of fear factor in particular. After taking addresses of the victims of suicide bombing, they were approached at their residences. Firstly, they were taken into confidence regarding the purpose of research and the ultimate use of data. Most of the victims cooperated; some were reluctant at start and 19% victims refused to provide the information. Before contacting the participants at their homes, it was ensured that the incident in which they became victims fall within the specified time range which was set as inclusion criteria.

The researcher personally visited all participants and distributed scales. One the time convenience of victims, the researcher requested and made it sure to fill out scales in his physical presence instead of dropping the scales at residences. After providing comprehensive account of study objectives, they were given instructions regarding completion of scales. The participants were verbally informed that they can withdraw from this study at any stage. Afterwards, they were requested to sign the informed consent. The questionnaires were given in sealed envelopes and after completion they were sealed again. The researchers ensured the participants that the information will be never shared with any person or organization at any stage and will only be used in this research. Participants were also assured that their identities will never be disclosed. Moreover, the option of “name” on the questionnaire booklet was kept “optional” in order to ensure the anonymity of participants. The researcher remained vigilant during scale completion and whenever participants faced

Table 1 reveals descriptive statistics, alpha coefficients and normality statistics for all variables. Alpha coefficients of all scales and subscales range from .71 to .96 which are greater than .70 and therefore depict that the reliability of the scales being used in the present study is quite satisfactory and the scales / subscales can be used for further analyses. Normality statistics show that skewness (.41 to .82) and kurtosis (-.08 to -.92) are less than +1 and -1 for all variables which are less than 1 and this is in the desirable range for claiming normality of the data. The magnitude of all correlation coefficients ranged from .57 to .98 which indicates moderate to high correlations and the directions among variables are theoretically and empirically desirable.

Table 2

Hierarchical regression showing moderating effect of resilience (including trait-state) between sense of coherence and outcomes

Predictors	Outcome: Depression		Outcome: Anxiety		Outcome: Stress		Outcome: PTSD	
	Model 1 B	Model 2 B	Model 1 B	Model 2 B	Model 1 B	Model 2 B	Model 1 B	Model 2 B
(constant)	16.27***	22.80***	16.26***	21.86***	43.11***	43.08***	8.62***	5.94***
SOC	-.05**	-.17**	-.06***	-.16**	-.30***	-.46***	-.07***	-.12***
R	-.06***	-.13***	-.13***	-.25***	-.87***	-.36***	-.43***	-.29***
SOC X R		-.01*		-.02*		-.03***		-.02***
R ²	.43	.44	.42	.43	.66	.70	.45	.56
F	113.79***	78.76***	109.83***	75.31***	292.76***	238.23***	122.95***	127.67***
R ²		.01		.01		.04		.11
F		5.36*		4.03*		44.13***		75.34***
(constant)	16.52***	11.26***	8.20***	8.36***	12.22***	10.24***	7.79***	7.45***
SOC	-.18***	-.20***	-.26***	-.18**	-.14***	-.15***	-.08**	-.13**
TR	-.22***	-.15***	-.33***	-.11*	-.50***	-.13*	-.43***	-.37***
SOC X TR		-.02***		-.02***		-.03***		-.01*
R ²	.45	.69	.44	.50	.53	.68	.45	.46
F	124.85***	225.58***	116.41***	101.32***	167.65***	213.46***	125.78***	86.20***
R ²		.23		.06		.15		.01
F		232.47***		40.25***		143.53***		4.26*
(constant)	45.77***	42.528***	51.72***	49.91***	10.94***	9.45***	15.79***	13.21***
SOC	-.35***	-.27***	-.37***	-.48***	-.11***	-.15***	-.20***	-.19***
SR	-.98***	-.50***	-.91***	-.40***	-.50***	-.34***	-.56***	-.16*
SOC X SR		-.06***		-.04***		-.05***		-.05***
R ²	.64	.71	.72	.64	.32	.51	.49	.58
F	268.56***	242.78***	269.51***	251.64***	154.09***	142.61***	162.21***	201.55***
R ²		.07		.08		.19		.09
F		68.58***		53.71***		71.83***		176.42***

Note. SOC = Sense of coherence; R = Resilience; TR = Trait resilience; SR = State resilience

Table 2 shows findings of hierarchical regression which depicted that resilience and its two domains including trait and state resilience moderated between sense of coherence and psychological disorders. Resilience negatively moderated between sense of coherence and depression. Similarly, resilience negatively moderated between sense of coherence and anxiety. Moreover,

resilience negatively moderated between sense of coherence and stress. Finally resilience and its two domains moderated negatively between sense of coherence and PTSD. Findings on the two domains of resilience depicted that trait resilience negatively moderated between sense of coherence and depression. Similarly, trait resilience negatively moderated between sense of coherence and anxiety. Moreover, trait resilience negatively moderated between sense of coherence and stress. Finally trait resilience and its two domains negatively moderated between sense of coherence and PTSD. State resilience negatively moderated between sense of coherence and depression. Similarly, state resilience negatively moderated between sense of coherence and anxiety. Moreover, state resilience negatively moderated between sense of coherence and stress. Finally state resilience and its two domains negatively moderated between sense of coherence and PTSD. Resilience and its two domains (in interaction with sense of coherence) decreased the level of psychological problems like depression, anxiety, stress and PTSD among victims of suicide bombing.

Discussion

The present study was undertaken to study the role of resilience as a moderator between sense of coherence and health-related consequences among victims of suicide bombing. Contrary to the past research which has focused on resilience as a core factor playing its role as a buffer for post-traumatic consequences, the present study is grounded in the more elaborated role of trait specific and state specific resilience. Sense of coherence and resilience are related constructs (Almedom, 2005) and both are found to be associated with a decrease in levels of depression, anxiety and PTSD in the traumatized group (Fossion et al., 2014). Thus the present study has investigated the moderating role of trait and state resilience between sense of coherence and its consequences among victims of suicide bombing in Pakistan. In order to achieve these objectives, three hundred survivors of suicide bombing were purposively selected from different areas of Pakistan. Four self-report scales were administered on the participants for collecting information for the constructs under

investigation. Thus, Sense of Coherence Scale (Shaheen, 2016), Trait-State Resilience Inventory (Sarwar, 2005), Depression Anxiety Stress Scale and Impact of Events Scale (Aslam, 2007) were major research tools used for data collection. After collecting the data through questionnaires, the obtained information was entered into SPSS-22 for analysis. Initially, descriptive statistics of variables described important trends in the data. The normality was ensured through computing the values of skewness and kurtosis. As recommended by statisticians, the skewness and kurtosis values for variables were less than 1 which is desirable to infer that data is normally distributed in terms of symmetry and pointiness.

Besides normality, the trustworthiness of the scales was also put on test by conducting reliability analysis. The alpha coefficients for the scales measuring different constructs were greater than .70 ensuring the consistency of results or scores for all variables (Kline, 1999). Reliability examinations were followed by validity analysis. To serve this purpose, construct validity was examined by computing the correlation matrix for the study variables. The correlation coefficients were in the theoretically anticipated directions. Sense of coherence and resilience had negatively associated with health consequences. As per past research, sense of coherence was inversely linked with psychological disorders like PTSD (Griffiths, 2008; Holmberg, Thelin, & Stiernstrom, 2004) and negatively correlated with depression (Richardson & Ratner, 2005; Fok, Chair, & Lopez, 2005), anxiety (Anwar, 2014) and stress (Rashid, 2015; Eriksson & Lindstrom, 2005) of the victims of suicide bombing. Similarly, resilience, trait-specific resilience and state-specific resilience were inversely correlated with PTSD (Riaz et al., 2015), depression, anxiety and stress (Riaz, Riaz & Batool, 2014) among the participants who survived from the suicide attacks but sustained severe injuries.

Both sense of coherence and resilience were found to be inversely correlated with negative mental health consequences. In health-disease, care-cure and prevention-intervention continuum,

sense of coherence focuses on health, care and prevention which ensure long-ranged strategic health gains (Antonovsky, 1979, 1987). Resilience and its domains were also found to be inversely correlated with negative outcomes which confirm its role as a buffer in the time of stressful experiences (Hiew, 2003). The normality, reliability and validity examinations provided grounds to take evidence based decision for drawing inferences on the basis of these scales measuring constructs of the study. Thus mainly moderation was computed through hierarchical regression analysis. The hypotheses were tested independently. The findings were same as anticipated on the basis of the existing body of empirical knowledge.

The first anticipation that resilience is likely to moderate the relationship between sense of coherence and PTSD was supported in this empirical inquiry. The theory of sense of coherence is autobiographical in nature and stems itself from the experiences of Antonovsky who introduced this concept to explain the trauma-exposed victims' ability to recover from the adverse effects of trauma. Thus sense of coherence is a resilience factor which offers assets for recovery from traumatic situations in life (Antonovsky, 1979). Just like the role of sense of coherence in countering effects of traumatic incidents, resilience offers trait and state specific capacities to work as shields against the damaging effects of trauma (Antonovsky, 1987). Numerous empirical inquiries have reported consistent findings in terms of the role of resilience in predicting PTSD inversely (Aslam, 2007; Lipkus, Dalbert, & Siegler, 1996).

The interactive effect of these two stress-buffering factors i.e. sense of coherence and resilience proved that along with sense of coherence, resilience buffers PTSD among victims of suicide bombing. The existing research confirmed that resilience buffers the PTSD among victims of man-made disaster including victims of suicide bombing (Bonanno et al., 2002; Fredrickson, Tugade, Waugh, & Larkin, 2003). In the present study, besides overall resilience, trait and state resilience also moderated between sense of coherence and PTSD. This indicates that, after and above sense

of coherence, the trauma recovery factors—either inbuilt in the personality of victims or emerging from the situational demands to respond to trauma—are equally effective in helping victims reducing their symptoms of PTSD.

Besides predicting PTSD, the hypotheses anticipating that resilience and its domains will moderate between sense of coherence and its health related consequences including depression, anxiety and stress were also supported in the current inquiry. The construct of sense of coherence has remained effective for both clinical and non-clinical populations (Antonovsky, 1996). Empirical studies (Riaz, et al., 2015; Shaheen, 2016) confirmed that the sense of coherence consistently negatively predicted depression in diverse samples including clinical and non-clinical samples. In this regard, the case of resilience is also similar to sense of coherence. Time after time, resilience proved itself as a superlative negative predictor of depression in non-clinical samples (Mujeeb, 2009) and at risk populations (Luthar, Cicchetti & Becker, 2000) including victims of man-made disasters in which the victims face even more severe consequences (Arata, Picou, Johnson & McNally, 2000).

Both trait and state resilience also inversely predicted depression in prior study (Riaz, Riaz & Batool, 2014). In addition to sense of coherence, the stance of the current empirical study was to investigate the buffering role of trait, state and overall resilience against depression among victims of suicide bombing. The findings confirmed that when incorporated in between sense of coherence and depression relationship, dispositional (trait) as well as situational (state) resilience buffers against depression caused by exposure to suicide bombing. Resilience, as a whole, also buffers against depression among victims of man-made disaster (Riaz et al., 2015). Robinson (2000) illustrated that inclusion of resilience in the prevention and intervention programs can be more beneficial.

Limitations

The study has certain flaws that can be addressed in future designs. Firstly, the low internal validity of the survey method can be addressed through triangulation in future research. Although all participants were direct victims of suicide bombing but still the confounding influence of the varying nature of numerous personal, social, cultural and contextual factors cannot be bifurcated. Secondly, the self-reported data has been collected through a single source by using scales which can be vulnerable for social desirability and single source biasness. Thirdly, common method variance may be a plausible threat to the accuracy of inferences drawn through this research. Fourthly, all scales used in this study were only translated in Urdu by indigenous investigators. Validation of these scales in the Pakistani context can improve the study and make the use of these scales more valid. More specifically, Confirmatory Factor Analysis (CFA) can be carried out for their validation. With all these limitations, the study is still worthwhile to understand the interactive effect of sense of coherence and resilience on reducing psychological problems resulted from being hit by suicide bombing. The findings can be replicated with the victims of natural disasters in future research.

Implications

The study focused on the interactive effect of two protective factors or coping mechanisms in countering the after effects of suicide bombing on the victims. Thus resilience in relation to sense of coherence predicted psychological problems. The most important insights shared by the present study are related to the moderating role of two domains of resilience including state resilience and trait resilience on the relationship between sense of coherence and psychological problems in general and PTSD in particular. Thus besides dispositional trait resilience, it can be developed like state resilience among victims by using different psychological strategies using counseling programs and therapeutic interventions. The concept of sense of coherence itself stems from traumatic incidents and provides ways to cope with stressors and

ensure health—making psychological rehabilitation possible. The same is proved in the case of the victims of suicide bombing in Pakistan. Thus developing sense of coherence among these victims can be very beneficial in originating or enhancing their ability to reduce psychological disorders and more specifically PTSD. The disasters are a global phenomenon and have no boundaries. Therefore the findings can be utilized by the community for preventions and interventions for the recovery of disaster survivors.

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