

Development of Indigenous Resilience Scale for Rescue 1122 Workers

Madeha Naz, Sadia Saleem, and Zahid Mahmood

Government College University

The degree to which one is affected by a traumatic experience depends, among other factors, on the one's place on the continuum between vulnerability and resilience. The Rescue 1122 Service are the frontline workers exposed to trauma as a part of their everyday life. This paper presents the systematic development of an Indigenous Resilience Scale to measure resilience in the 1122 Rescue Workers. Initially, 55 items were gathered and collated through semi structured interview and validated through experts for their significance and relevance to reflect resilience. Total 48 items with highest endorsement scores were retained for the scale which was administered on 165 Rescue 1122 male workers along with a key list of Posttraumatic Stress symptoms. Factor analysis revealed four factors contributing to resiliency namely Self-confidence, Self-control, Extraversion, and Spirituality, and a negative factor namely Vulnerability. Results are discussed in terms of factors in cultural context and the psychometric properties of the scale.

Keywords: resilience, rescue workers, PTSD, culture, validity, reliability

Resilience is defined as a dynamic process of exhibiting positive behavioral adaptation when encounter significant adversity or trauma (Luthar, Cicchetti, & Becker, 2000). Resilience is the capacity that enables the person to adapt well after experiencing stressful events. Each culture has its own resilient attributes that plays role in order to promote resilient attributes among particular ethnic groups (McLaughling, Doane, Costiuc, & Feeny, 2009). The standard definition of resilience could be problematic because it does not sufficiently account for cultural and contextual difference in how people or other systems expressed resilience (Ungar, 2004).

A large body of research on resilience has come from studies in children and adolescents exposed to a range of stressors (Luthar et al.,

Madeha Naz, Sadia Saleem, and Zahid Mahmood, Department of Clinical Psychology, Government College University, Lahore, Pakistan.

Correspondence concerning this article should be addressed to Madeha Naz, Department of Clinical Psychology, Government College University, Katchery Road, Lahore, Pakistan. E-mail: madehanaz@ymail.com

2000; Masten & Coatsworth, 1998). Fewer studies have been conducted with adult population (Charney, 2004). The concept of resilience emerged as a major research topic from the studies of children of Schizophrenic mothers in 1980's (Luthar et al., 2000; Masten, Best, & Garmezy, 1990). Werner (1971) was considered one of the first scientists to use the term resilience. She studied the children from Kauai (Hawaiian Islands). The people of Kauai were quite poor and many children of her study were living with poor and mentally ill parents. She noted that quite a large number of children in her study who were living in a state of severe privacy exhibited destructive behaviors later in their teens. However, one-third of these youngsters did not exhibit such type of destructive behaviors. She called the children of later group as *resilient*. She observed that the resilient children and their families had some specific attributes that differentiate them from nonresilient individuals (Werner & Smith, 1982).

Some researches have investigated resilience as a trait of individuals that one may have since birth (Caspi et al., 2003) while other view resilience as a process (Brooks, 1994; Jacelon, 2008) that individual learns from one's environment and life experiences. Resilient individuals have both intrinsic and extrinsic attributes that enable them to keep stable with hard times and live a happier life that is filled with safer risks (Goldberg, 1977; Haan, 1977; Murphy & Moriarty, 1976; Nuechterlein, 1970). Goldman (2005) described a strong framework to positively deal with life issues including being optimistic, always plan realistic goals, self-confidence, and self-appreciation, accept the circumstances, and have strong and meaningful spiritual belief systems. Resilient people are said to exhibit self-controlled temperament and are consistent, dependable, assertive, socially skilled, and not self-defeating; while, less resilient individuals are uncontrolled and are impulsive, over-reactive, unpredictable, moody, self-indulgent, and so on (Letzring, Block, & Funder, 2004).

There is a controversy regarding this issue whether resilience is a trait or a process which requires further exploration and research work. Resilience is conceptualized worldwide as a capacity to cope with traumatic events which needs encouragement to win over vulnerability and risk. Ego-resiliency is trait resilience that is the individual's ability to dynamically and appropriately self-regulate that allows high resilient people to adapt more quickly to changing circumstances and such characteristics are consistent across cultures (Block & Kremen, 1996). In this study we just want to explore the concept of resilience in the context of rescue workers in our culture.

Post-trauma stress is a natural emotional reaction to deeply shocking and disturbing experience. It is a normal reaction to an abnormal situation. Post Traumatic Stress Disorder (PTSD) is the psychological reaction that can occur after the experience of extreme traumatic stressors involving direct personal experience of an event that involves actual or threatened death or serious injury, or witnessing an event that involves death, injury or threat to the physical integrity of another person. Acute Stress Reaction/Disorder (ASD) and its symptoms logically resemble with PTSD. The difference among these two conditions is that the symptoms of ASD are experienced during or immediately after trauma and resolve within four weeks. If the symptoms of ASD last for more than three months or longer, it is labeled as PTSD (American Psychological Association [APA], 2000).

Most of our knowledge about the PTSD comes from the terrible experiences of the First World War. Sales, Baum, and Shore (1984) found that the people who are struggling with stressful life situations are at greater risk of developing enduring stress reaction. The risk of developing the PTSD is directly related to experience of traumatic stressors, that is more the exposure higher the risk of developing PTSD (Adshead, 2000). Generally, people experience a limited number of traumatic incidents during the course of life, but the rescue workers are exposed to extremely traumatic incidents on daily basis. Disasters always occur suddenly and cause huge loss of lives and assets. In such type of disasters, rescuers help the victims and have to face hazardous and challenging tasks in which the chances of injuries are very high. Nevertheless, rescuers are said to be affected by trauma less than the primary victims because of their resilience (Morren, Dirkzwager, Kessels, & Yzermans, 2007).

Director General, Punjab Emergency Services Rescue 1122 reported that the Rescue 1122 Service is the first emergency service in Pakistan designed in 2004 to deal and handle emergencies and natural disasters. This is a uniformed, regimented, rigorous training service which requires efficient, mobile working under pressure and in dangerous conditions. Over the last five years, the Rescue 1122 has dealt with more than 397687 emergency calls and rescued over 401669 victims, maintaining its average response time of seven minutes. The nature of emergencies and disasters dealt by rescue service includes road traffic accidents, medical emergencies, arson, explosions, suicide bombing, bomb blast, and building collapse (R. Naseer, personal communication, June 5, 2008).

In order to investigate the resilience in rescue workers several studies carried out in Western countries. However, North et al. (2002)

studied PTSD in rescue workers after the Oklahoma City bombing, approximately 34 months after the disaster, concluded that the low rate of PTSD in rescue workers was related to their career selection, their experiences, and post disaster mental health interventions. Solomon, Berger, and Ginzburg (2007) carried out a study on resilience in body handlers, finding considerable resilience in the body handlers and a low level of psychiatric symptoms. They suggest several reasons for body handler's resilience including their strong religious beliefs, their motivation and self-esteem factors, and their repressive coping styles. On the whole, there have been few studies on the effect of trauma on the well being of relief workers (McCall & Salama, 2009).

Cross-cultural studies on the impact of traumatic experiences are few and far less in nonwestern culture. Ungar (2008) observed that the meaning of resilience in aboriginal people who lived side by side in western settings was not clear, even less is known about resilience. There is multiplicity of assessment tools available in order to measure the resilience in children and adults with well established reliability and validity including Connor Davidson Resilience Scale (Connor & Davidson, 2003) and the Scale for Adults Resilience (Friborg, Hjemdal, Rosenvinge, & Martinussness, 2006). In recent years, there has been an increased sensitivity regarding the application and indigenization of the tools of psychology across culture. If progress is to be made towards this goal, it is important to investigate relationship between indigenous construct and universal ones (Gergen, Gulerce, Lock, & Misra, 1996).

It seems that the culture plays a vital role in shaping an individual's beliefs and personality. The main construct of resilience is similar all over the world but the manifestation of resilience attributes may vary from culture to culture. Niaz (2006) carried out a study to see the impact of devastating earthquake of 2005 in Pakistan which killed over 100,000 people. People who had lost loved ones, homes, or had been injured and lost their body parts. In the face of such hard times or trauma, their sense of thankfulness and gratefulness to God was irresistible. Instead of being aggrieved and losing hopes, they had sought refuge in God, religion and faith, asking Him for help and divine forbearance. The fundamental principle was that the God gives and takes away or we all come from Him and we will all return to Him. She concluded that faith in God Almighty was major factor in strengthening resilience and promoting recovery from PTSD. Thus, it is essential to develop culturally relevant and linguistically sensitive screening instruments to measure resilience for an at-risk population like Rescue Workers of 1122.

This study is an attempt to develop an indigenous resilience scale by exploring the phenomenology of resilience in our culture. There is no indigenous tool available in Pakistan which measure resilience in Rescue 1122 Workers. Stewart et al. (1999) described that by using entirely western constructs and items, investigators take the risk of imposing a frame that might miss the key relationships in nonwestern cultures. It is also important that the construct may have different relevance in different cultures e.g. religion plays a very important role in Pakistani culture. The individual's responsibilities to God are emphasized in many aspects of daily life. Therefore, the present research is an attempt to develop a scale for measuring resilience considering the culture specific presentation with well established validity and reliability. Since this is an exploratory research, no main hypothesis was established. The secondary hypothesis states that there will be a negative correlation between resilience and posttraumatic stress symptoms.

Method

This study was carried out in a series of three phases.

Phase I: Exploring Phenomenology of Resilience

In order to explore the core and cultural-specific domains of resilience among rescue worker Phase I was carried out. Five senior officers of Punjab Emergency Service with minimum 2 years job experience were asked to list the attributes of a resilient individual in the 1122 emergency service context. The concept of resilience was operationally defined as the capacity of the individual to recover from adverse effects of negative life experiences and return to the normal life patterns. In this way, 23 different domains of resilience were gathered including confidence, spirituality, extraversion, sense of humor, problem solving skills, stress management, supportive family and friends etc. On the basis of the reported resilience domains semi-structured interviews were carried out with 25 professionals and experts. They all were qualified clinical psychologists with at least 1 year of clinical experience. They were asked open ended questions based on the domains. In this way, a list of 60 items was collected for further validation.

Phase 2: Opinion by Subject Matter Experts

In order to select the final items from initial pool of 60 items for Indigenous Resilience Scale (IRS), twelve qualified and experienced

clinical psychologists with minimum two years of experience were asked to rate each item on a 4-point rating scale (0-3) to the extent each item reflects the concept of resilience. All those items which received 70% agreement from the experts were retained for the final scale. At the end 55 items were finalized for IRS.

Phase 3: Factor Analysis and Validation

For the final selection of items factor analysis on 55 items was carried out and later discriminant validity was established.

Sample. To establish the psychometric properties, a sample consisted of 165 male rescuers was taken from thirteen stations of Punjab Emergency Service Rescue 1122, Lahore. The age range of the sample was 20-57 years with the mean age 26.78 ($SD = 4.87$); educational level ranged from Middle (8th grade) to B.Sc.; current job duration was 1-5 years ($M = 2.60$, $SD = 1.03$); and 60% were married and 40% unmarried.

Instruments. Other than initial form of IRS comprising of 55 items with a four point rating scale from 0 *Never* to 3 *Always* with high score indicating higher resiliency among individual, Urdu version (Naz, 2008) of Posttraumatic Stress Diagnostic (PTSD) Scale originally developed by Foa (1995) was administered for establishing discriminant validity of finally selected items of IRS. This scale corresponds to diagnostic criteria of DSM-IV for PTSD. It was selected as it is very close to the DSM-IV model and gives a comprehensive account of frequency and intensity of key symptoms and the areas of life affected. This scale is useful for those who work with population at risk for PTSD and helpful for comparing prevalence rates of PTSD in particular population.

This scale consisted of 49 self-report items, divided into four parts including Symptom Severity Score, Number of Symptoms Endorsed, Symptoms Severity Ratings, and Level of Impairment in Functioning. In this study part 3, Symptoms Severity Rating scale with response categories ranging from 0 *Never* to 3 *Always* was used. It consisted of 17 items including the symptoms of Re-experiencing, Avoidance, and Arousal. There is no reverse scoring item in the whole scale. The cut-offs for the scale are 0-10 *Mild*, 11-20 *Moderate*, 21-35 *Moderate to Severe*, 36 and above *Severe*. The age range for using the scale is between 18-to-65 years and requires only 10-15 minutes for completion. The test-retest reliability of the scale is .87; alpha coefficient is .83; and Kappa coefficient is .74 (Foa, 1995) that shows PTSD being a reliable scale.

Procedure. Initially, permission was obtained from the authorities of Punjab Emergency Service, Lahore. They were informed about the purpose of the current research. They were assured that all the information would be kept confidential and would only be used for research purpose only. Once permission was granted, the researcher personally visited thirteen centers of Punjab Emergency Service to collect data. All the participants were informed about the purpose of the research and they were assured about the privacy and confidentiality of data collected from them. All those who were approached agreed to participate in the study. They were given the final protocol comprising IRS and PTSD scale along with some demographic information. At the end, all the participants were thoroughly debriefed. In order to determine the test-retest reliability, 15% sample was retested after one week's interval.

Results

This section deals with establishing the factorial structure and psychometric properties of the IRS.

Factor Structure of the IRS

In the present research, Principle Component Analysis with Varimax rotation was carried out on 55 items of IRS. Varimax rotation is one of the methods of the orthogonal rotation aimed to maximize the simplicity, interpretability, and variance of the factors (Kahn, 2006; Kim & Mueller, 1978). In order to determine the number of factors various criteria were used including Eigen Value greater than 1 and examination of the Scree Plot (Cureton, & D'Agostino, 1983; Kline, 1994). The number of factors were also determined by using the Kaiser's criterion (1974) of total explained variance.

Kaiser-Guttman's retention criterion of Eigen Values greater than one supported an eight factor solution for IRS that resulted in over extraction. Later, subsequent factor analyses were carried out with seven, six, five, and four factor solutions. The five factor solution with Varimax rotation was found to be the best with minimum dubious items and most interpretable factor structure. All those items with .30 factor loading were retained (Kline, 1994). In this way, 7 items were excluded from the IRS having factor loading less than .30. A Principle Component Analysis with Varimax Rotation carried out on 55 items with five factor solution. The factor loadings of 48 items are given in Table 1.

Table 1

Factor Loadings, Eigen Values, and Variance Explained by 5 Factors of IRS with Varimax Rotation (N = 165)

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
2	.44	.14	.15	.17	.14
3	.50	.20	.24	.20	.20
5	.54	.26	.25	.24	.22
6	.44	.23	.21	.21	.23
7	.34	.13	.12	.16	.22
8	.35	.17	.17	.29	.10
9	.52	.10	.21	.24	.10
12	.55	.17	.14	.14	.11
13	.49	.21	.12	.12	.15
14	.45	.22	.17	.188	.16
17	.58	.26	.19	.15	.13
18	.55	.17	.25	.15	.11
19	.45	.19	.11	.11	.12
29	.46	.16	.19	.19	.21
33	.58	.29	.19	.12	.11
55	.49	.27	.28	.11	.11
16	.28	.49	.19	.13	.16
20	.28	.58	.14	.17	.19
21	.29	.35	.20	.17	.21
26	.13	.47	.11	.15	.22
32	.27	.47	.19	.18	.20
35	.15	.36	.18	.23	.16
36	.19	.37	.14	.27	.17
40	.22	.64	.16	.16	.23
44	.12	.59	.12	.17	.22
45	.28	.59	.15	.28	.15
48	.13	.53	.21	.10	.20
48	.13	.53	.21	.10	.20
49	.26	.46	.17	.16	.13
50	.19	.66	.19	.11	.16
54	.11	.42	.29	.16	.14
30	.13	.26	-.55	.13	.17
41	.18	.12	-.80	.12	.24
43	.11	.19	-.69	.19	.14
46	.16	.13	-.68	.18	.17
52	.22	.24	-.64	.24	.25
11	.20	.19	.21	.63	.24
15	.20	.13	.25	.53	.19
22	.15	.26	.10	.61	.21
28	.17	.19	.13	.46	.16
31	.14	.17	.21	.68	.18
38	.24	.15	.21	.54	.19

Continued...

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
42	.16	.23	.13	.45	.19
53	.11	.29	.26	.41	.17
24	.22	.21	.24	.26	.66
27	.21	.23	.29	.25	.58
37	.27	.12	.18	.18	.53
39	.12	.11	.16	.13	.71
47	.13	.15	.17	.16	.31
Eigen Values	9.88	3.38	2.63	2.44	2.06
% of variance	17.96	6.14	4.79	4.44	3.75
Cumulative variance	17.96	24.11	28.91	33.35	37.10

Note. Factor loadings of acceptable items are given in boldface.

Table 1 shows factor loadings and percentage of variance explained by five factors. Factor analysis of IRS produces four positive factors representing resilience including Self-confidence, Self-control, Extroversion, and Spirituality, and one negative factor representing absence of resilience named Vulnerability. A label was assigned on the basis of commonality of items in the factors. The description of the five factors is as following:

1. *Self-confidence.* The factor one consists of 16 items comprising of belief on strengths, ability to cope, helping behavior, assertiveness, and problem solving skill.
2. *Self-control.* The factor two consists of 14 items comprising of strong will power, emotional stability, communication, self-satisfaction, and positive self-concept.
3. *Vulnerability.* The factor three is a negative factor consisting of 5 items representing absence of resilience comprising anxiousness, failure to do work, making mistakes, fatigue, and unable to concentrate.
4. *Extroversion.* The factor four consists of 8 items comprising of sense of humor, initiate conversation, and sociability.
5. *Spirituality.* The factor five consists of 5 items comprising of strong faith on Allah and caring others.

Psychometric Properties of IRS

Discriminant validity. In order to establish the discriminant validity of IRS, third part Symptoms Severity Ratings of PTSD scale including Avoidance, Re-experiencing, and Heightened arousal was used and Pearson Product Moment Correlation was computed.

Table 2

Cronbach Alpha and Inter-subscale Correlations of IRS and Symptom Severity Rating of PTSD

Scales	α	M(SD)	SC	ST	VU	EX	SP
IRS							
SC	.83	35.9(7.4)	---	.60***	-.36***	.30**	.31***
ST	.84	29.5(7.3)	---	---	-.34***	.31***	.32***
VU	.77	4.4(3.3)	---	---	---	-.13	-.05
EX	.71	14.8(4.6)	---	---	---	---	.21**
SP	.53	15.5(2.3)	---	---	---	---	---
PTSD							
AV	.61	2.25(1.9)	-.34***	-.26**	.51***	-.12	-.17*
RE	.69	4.6(3.5)	-.20**	-.16*	.40***	-.20*	-.13
HA	.72	4.4(2.4)	-.15	-.14	.09	-.11	-.14

Note. SC = Self-confidence; ST = Self-control; VU = Vulnerability; EX = Extroversion; SP = Spirituality; AV = Avoidance; RE = Re-experiencing; HA = Heightened arousal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

A significant negative correlation is found between four positive factors of IRS and three factors of PTSD scale ($p < .001$). A significant positive correlation ($p < .001$) is found between Vulnerability factor of IRS and PTSD factors. In other words, higher the score on four positive factors of Resilience scale including Self-confidence, Self-control, Extroversion, and Spirituality, lower the PTSD symptoms are; and higher the scores on Vulnerability scale represent more PTSD symptoms. In this research, the IRS five factors are also correlated with the three factors of PTSD scale including Avoidance, Re-experiencing, and Heightened Arousal. A highly significant negative correlation ($p < .001$) is found between the four positive factors of IRS and three factors of PTSD Scale (see Table 2).

Psychometric Properties of IRS

To further establish psychometric properties, reliability and validity estimates and correlations were computed.

Construct Validity. Table 2 indicates the alpha values of all five factors of IRS; the values of alpha ranges from .71 to .84 and for total are .85. The figures indicate the high internal consistency of subscales and scale is considered to be reliable measure. Significant positive correlations between the four positive factors of IRS are achieved, contrary to this, negative correlations of Vulnerability with four positive factors has appeared as expected.

Test-retest reliability. In order to establish the test retest reliability of the IRS, 15% ($n = 17$) of the sample was retested after

one week's interval. One week test- retest reliability of the IRS is .84 ($p < .001$).

Split-half reliability. Odd and even method was used to determine the split-half reliability of IRS and results showed that the split-half reliability coefficients was found to be .71 ($p < .001$) and for both scales were found to be .76 and .78 ($p < .001$), respectively.

Discussion

Pakistan has suffered a spate of bombings, explosions, and violence which has resulted in deaths of thousands of people, with 10,000 sustaining physical injuries and an untold number of suffering from the psychological effects of these traumatic experiences. The affect of trauma on primary sufferers, is well known. In addition, the secondary sufferers, those who witnessed such atrocities or have to care for the victims of these unfortunate incidences, are also affected in a similar way. In the previous literature, it was found that the workers struggling with stressful life situations are at greater risk of developing PTSD or other mental health problems (Adshead, 2000; Morren et al., 2007; Sales et al., 1984). The Rescue 1122 service of the Punjab has the responsibility of attending both the primary and secondary victims of all kind of the traumas. Set in 2004, the Rescue 1122 service has cared for millions of incidences of all kinds, types, and severity. In order to meet the demands of the job these Rescue workers have to be strong, healthy, and resilient. The selection of Rescue 1122 is very rigorous and thorough and demands a very high standard of fitness, both the mental and physical. The impact of the traumatic events on the rescue workers is the main focus of the study.

A construct may have different relevance in different cultures. Culture plays vital role in developing resilience. Therefore, this study starting with the phenomenological approach, gathered the key attributes of resilience required by the instructors and trainers and further verified these by senior officers of the service. Twenty three domains elicited through this procedure were further divided into 60 specific attributes reflecting resilience. These 60 attributes were rated by the experts, for this purpose the concept of resilience was operationally, as proposed by Luthar et al. (2000), described to them and they were asked to rate each item to the extent it reflect the resilience. Finally, on the basis of factor analysis 48 items were retained for the final scale. Factor analysis revealed four resilience factors — Self-confidence, a sense of Self-control, Extroversion, and

Spirituality —and one negative factor, Vulnerability, showing the absence of resilience. Literature also supports these resilience factors (e.g., Letzring et al., 2004; Solomon et al., 2007) that resilient people have better self-control, socially skilled, assertive and also have self-controlled temperament. The prominent factor that was Spirituality consistent with cultural and religious beliefs including faith in God, acceptance on faith, expectations of God help, and the strength of trust in God is the important factor. The concept of spirituality and religiosity in this scale also went along with the existing literature. For example, consistent with previous literature (Goldman, 2005; Niaz, 2006), it was found that faith in God and meaningful spiritual belief system was the major factor in increasing resilience and promoting recovery from trauma.

The negative factor contained a number of items very similar to neurotic, somatic, and anxiety like symptoms. Such items were found to be antithesis of resilience. It was also obvious in the literature that less resilient individuals are engaged in such types of behaviors including impulsivity, over-reactive towards problematic situations, moody, and self-indulgent (Letzring et al., 2004). To validate this resilience scale, it was found that it correlated significantly with well known list of symptoms commonly associated with PTSD. On the basis of the psychometric strength of this scale, one can use it in a number of further studies that might help in the selection and training of rescue workers. This scale can also be used to study the differential impact of trauma on rescue workers and depending on the magnitude of the problem help develop and monitor in better counseling services.

Conclusion

This research is first of its kind of work in Pakistan with reference to Rescue 1122 service. This study helps to understand the construct of resilience in cultural specific perspective. Results show that the resilience is one of the key attributes required in rescue workers and rescuers who are confident, extrovert, spiritual, and have better self-control are resilient. This scale could be used as an adjunct to other selection criteria to improve the efficiency of selection procedure in rescue service. Furthermore, it will help in identifying the resilience attributes that will help train better and more effective rescue workers and reduce attrition rates. This scale could be used to identify the person who is at risk to develop PTSD. In future, this scale could be used in further studies to see its relationship with different situations and personality constructs. It is hoped that this

scale may contribute significantly in further studies by adding more understanding of the phenomenology of resilience in our culture.

Limitations and Suggestions

The significant limitation of the current study was that the sample was drawn only from the Rescue Workers of Lahore only, therefore, it cannot be considered as representative sample. This study described the use of phenomenological approach. This model can be used in future researches in order to develop culturally relevant tools. The sample size of the current study was smaller so there is need to replicate the research on larger sample.

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