



Development and validation of the humanitarian aid workers resilience scale (HAWRS)

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Abstract

Background: Humanitarian aid workers experience various challenges in disasters, which affects their wellbeing. Being resilience can help volunteers to adapt to them. This study was conducted to develop and validate a resiliency questionnaire to evaluate the resilience of humanitarian aid workers in disasters.

Methods: This study was conducted in 2 phases between Dec 2017 and Oct 2018. In the first phase for item generation, we used qualitative content analysis. Face-to-face semi-structured interviews with 18 humanitarian aid workers were used for data collection. In the second phase, by conducting a quantitative study, the psychometric properties of the scale including face, content and construct validities as well as internal and external reliabilities, were determined. Data analysis was performed using SPSS 19 and the significance level was set at less than 0.05.

Results: Six main subjects were extracted from the first-stage data using content analysis. The final questionnaire included six factors and 31 items after validity and reliability criteria analysis. These six factors including organizational supports, individual factors, organizational planning, social support, teamwork and challenges of disaster scene included 52.19% of the variance. The internal consistency was confirmed as well (Cronbach's alpha = 0.814).

Conclusion: This specific self-assessment questionnaire can be used for scoring the resilience of humanitarian aid workers in disasters. In the case of low resilience score of volunteers, managers should avoid sending them on missions and try to improve their resilience through educational programs.

Keywords: Humanitarian aid workers, Resilience scale, Disaster

Conflicts of Interest: None declared

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Introduction

Every year, thousands of volunteers are sent to work in natural or man-made disasters. The purpose of their actions is to provide essential support for the affected population and alleviate their suffering (1, 2). However, during the mission, volunteers may face dangerous and intricate situations that often have not been adequately prepared for them. Some of these factors experienced by them are exposure to death, injury, grief, unsafety (3), burnout (4), sleep problems, anxiety, depression and posttraumatic

stress disorder (PTSD) (5-7).

Some studies have indicated that the prevalence range of PTSD in disaster relief workers varies from 6.2% to 42% (8), and depression rates range from 4% to 68% (9, 10), and these can increase the risk of occupational burn-out among them.

Such distress affects not only volunteer's mental health, but also affect the productivity and functioning of their organizations (8). Many of them have had little experi-

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↑What is "already known" in this topic:

Resilience is a key factor for humanitarian aid workers. The lack of a specific scale to assess resilience in humanitarian aid workers is highlighted.

→What this article adds:

Humanitarian aid workers' resilience scale (HAWRS) which has been developed and validated in this study, can be used specifically to assess the resilience of humanitarian aid workers in disasters.

ence, training, or preparation in disaster response. They often work for a few days and then have no contact with their agency and do not receive any support; thus, they may be more vulnerable to mental health problems.

Resilience is a key factor that can decrease burnout in professional personnel and have a protective role (11). In other words, resilience can help people to adapt to their challenges (12). Many factors affect volunteer's resilience. Recognizing these factors is important and useful for organizations that deploy volunteers (2). Although there are some studies on resiliency of humanitarian aid workers, the lack of specific questionnaire for assessing the resilience of humanitarian aid workers highlights the need for developing a valid scale for volunteers (13).

The aim of the present study was to develop a resilience scale of Iranian humanitarian aid workers and its validity, which is compatible with the Iranian context (Appendix 1). This questionnaire can help managers to identify volunteers who have low resiliency. Such identification can prevent the challenges of sending them to missions.

Methods

Study Design and Setting

This study which was conducted between Dec 2017 and Oct 2018 in Iran includes extracting the subjects of the resilience of humanitarian aid workers, and validity and reliability criteria analysis. Content analysis and data generation were carried out in the first phase. Psychometric properties of the tool and its validity and reliability were conducted at the second phase. This study was conducted on volunteers who worked in the Iranian humanitarian organizations in Iran (14).

Designing the Humanitarian aid workers resilience scale

In the first phase, fieldwork was performed. a number of 18 humanitarian aid workers (from different organizations) with experience of humanitarian operations were selected by purposive sampling method. Data were gathered using semi-structured face to face interviews to explore the resilience factors. All interviews were held in Persian, then transcribed verbatim and translated into English. Some examples of the questions used for the interview included "Talk about your experience of volunteering in disasters", "Talk about your problems during humanitarian missions" and "Talk about your strategies for solving these problems". Data collection was continued until data saturation was achieved. Graneheim's approach was used for data analysis (15).

In the second phase, the item pool was generated based on a literature review and finding of the first phase. The psychometric properties of HAWRS including face, content and construct validities as well as reliability, were evaluated.

Trustworthiness

In this study to increase credibility, we engaged in close interaction with participants from various settings, selected the best meaning units and categories, and drew on the best quotations from interviews. Member check and ex-

ternal check were used to increase dependability. All documentation kept by researchers in this study to increase conformability. To increase transferability, we used purposive sampling, and participants were selected from a various setting (16).

Psychometric evaluation

Face validity: Qualitative and quantitative face validity was done. To assess qualitative face validity, 10 volunteers who worked in humanitarian aid organizations were invited to read the items, comment on the relevance, and difficulty of each item. Then items were revised and re-written based on their views. To evaluate quantitative face validity, 10 volunteers were asked to rate the importance of the items on five-point Liker scale. The item impact ≥ 1.5 indicated the appropriateness of the item (17).

Content validity: Content validity ratio (CVR) and content validity index (CVI) during this step were done. A number of 10 experts in disaster management and instrument development was asked to score each item on a three-point scale ('necessary', 'useful but not necessary', and 'unnecessary') for calculating the CVR. Then items with CVR values of 0.62 or higher were selected, based on the Lawshe Table (18).

To calculate the CVI, 10 experts were invited to rate the relevance of each item. To calculate the item-level content validity index (I-CVI), the number of experts who scored a particular item as 3 or 4 was divided by the total number of experts. A CVI value of 0.79 or higher was considered satisfactory (19).

To calculate the scale -level content validity index (S-CVI), the S-CVI average (S-CVI/Ave) technique was used, and a S-CVI/Ave value greater than 0.90 indicated a very good content validity (19).

Construct validity: Exploratory factor analysis (EFA) was used to investigate the factor structure of the tool. In this process, the number of variables based on similarities between them is reduced to a smaller number of factors. Kaiser-Meyer-Olkin (KMO) test for Sampling Adequacy was done at the beginning of EFA.

Sample size: The sample size was considered at least 150–300 cases or 5–10 individuals per item in the Scale (20, 21). The participants were selected by random cluster sampling from Iranian Humanitarian aid workers who were active in different cities and organizations. Lack of serious mental and physical illness and having at least one experience in the disaster were considered as inclusion criteria. People who had not completed the scale were excluded. The scale has two parts: 1- demographic characteristic (age, sex, educational level, organization, and marital status and experience years), 2- Humanitarian aid workers resiliency items.

Reliability: The internal consistency of the scale was examined by Cronbach's alpha and stability of the scale was examined using the test-retest method (22). To measure the stability of scale using the intraclass correlation coefficient (ICC), a sample of Humanitarian aid workers (n=30) completed the HAWRS twice with a 14 days interval.

Statistical analysis: In order to be sure of sample ade-

quacy, the Kaiser-Meier-Olkin test was performed. For assessing construct validity, varimax rotation was used and for factor extraction, the Maximum Likelihood Estimation (ML) was applied. In the extracted factors, minimum factor loading 0.40 was used to keep the items. To measure the number of HAWRS factors, a scree plot with eigenvalues higher than 1 was used (23). SPSS 19 software was used for data analysis.

Results

At the end of the qualitative study, a pool of 142 items was extracted. Items that had overlap with others were excluded. Finally, 61 items remained for psychometric assessment at the next stage.

A total of 220 questionnaires was collected. After excluding a number of 20 incomplete questionnaires (9%), 200 questionnaires were analyzed (response rate 91%).

The participants were mostly male (72%). The mean age of participants varied from 18 to 58 years (mean = 31.52 ± 7.52 years), and their experience in humanitarian aid works ranged from 1 to 35 years (mean = 7.32 ± 4.48 years) respectively (Table 1).

In the face validity assessment, no items were omitted because the impact factor score was above 1.5. In the CVR assessment, 7 items were removed because $p < 0.6$ and in the CVI assessment, 2 items were omitted. Total CVI score was 0.94. At the end of this stage, a number of 52 items remained in the scale.

Then an explanatory factor analysis (EFA) was performed to identify the factorial structure of the Humanitarian aid workers' resiliency scale with 52 items. At this phase, a KMO test and Bartlett's test of sphericity were performed, finding a KMO value of 0.733 indicated that sample size was appropriate for factor analysis, the result

Table 1. Participant demographic characteristics

Variable	Status	Frequency (%)
Marital status	Single	72 (36%)
	Married	128 (64%)
Educational Degree	Under diploma	61 (30.5%)
	Bachelors	101 (50.5%)
	Masters and higher	38 (19%)
Work Experience (year)	1-5 years	75 (37.5%)
	6-10 years	110 (55%)
	> 10 years	15 (7.5%)

Table 2. Rotated Factor Loadings for the 31-Item Instrument

Factors and themes	Rotated component matrix					
	1	2	3	4	5	6
Organizational Support						
The experiences of the volunteers are important to the authorities of the organization	0.615					
Creating motivation (competitions, trips...) is a part of the authorities plans	0.748					
Psychological support (before, during and after missions) will be presented to volunteers	0.802					
Up-to-date facilities and equipment will be available for the volunteers	0.703					
The organization provides complete information of the mission to volunteers	0.457					
Individual Factors						
I believe in my personal capabilities	0.55					
I have received the necessary education for dealing with stress in disasters scene	0.474					
I like teamwork	0.533					
I can communicate well with team members	0.412					
I forget bad memories of the mission using the methods I have learned	0.588					
I use relaxation techniques to reduce stress	0.472					
I am consulting with others in the face of stress	0.572					
In the face of problems in the disaster scene, prayer gives me relief	0.548					
Organizational Planning						
The organization chooses competent individuals as leaders in the missions			0.586			
The organization has plans to deal with the crisis			0.719			
The organization provides food and facilities for volunteers at the missions			0.702			
Reinforcements arrive on time in missions			0.635			
The organization has plans for preparing volunteers before the mission			0.613			
Professional training will be performed for the volunteers			0.511			
Social Support						
My family agrees with my presence in the missions				0.598		
My family supports me when I'm on missions				0.601		
Communicating with my family while on missions gives me positive energy				0.512		
The media supports volunteers activities				0.558		
The people appreciate the volunteers				0.544		
Team Work						
The volunteers support each other					0.800	
The volunteers have friendly relationships together in missions					0.785	
Teamwork is being done on mission					0.722	
Challenges of Disaster Scene						
Crowds have a negative impact on my performance						0.777
Insecurity at the scene of disaster prevents doing my job						0.752
The stress of encountering disaster scene has a negative impact on my performance						0.768
At the scene of the disaster, bad behaviors of the injured person, disappoint me						0.651

Table 3. Cronbach's alpha values of six factors

Factors	Cronbach's alpha	Number of items	p
Organizational Support	0.860	5	<0.001
Individual Factors	0.779	8	<0.001
Organizational Planning	0.812	6	<0.001
Social Support	0.794	5	<0.001
Team Work	0.811	3	<0.001
Challenges of disaster scene	0.830	4	<0.001

of the sphericity test indicated the scale's ability to categorize the items and form factors ($p < 0.001$).

Varimax rotation showed that 52.199% of the total variance was related to six factors (Table 2).

Factor one contained 5 items related to organizational support. Factor two included 8 items related to individual factors. Factor three contained 6 items related to organizational planning. Factor four included 5 items related to social supports. Factor five contained 3 items related to teamwork. Factor six consisted of 3 items related to the challenges of the disaster scene.

The ICC of the HAWRS was 0.865, and the ICC of its dimensions ranged from 0.77 to 0.86, confirming the stability of the scale (24) which indicated the good stability of the HAWRS. The internal consistency of the scale was calculated using the Cronbach's alpha coefficient of 0.814, which indicated the good homogeneity of the HAWRS items (Table 3).

Discussion

According to validity and reliability criteria, the 31-item instrument is applicable to assess the resilience of Humanitarian aid workers in disasters.

Despite the importance of the issue of resiliency for the volunteers, the literature showed that there has been no scale to assess resilience in Humanitarian aid workers in disasters. The KMO value was evaluated as "good" in this study that confirmed the construct validity of the questionnaire and the high quality of the factor analysis. The Cronbach's alpha showed a good value, i.e. 0.814 which is consistent with some studies (25, 26).

In the next section, we will discuss six factors affecting the resilience of Humanitarian aid workers:

Organizational support was the first factor that is related to resilience and reported by previous studies and contained 5 items (1).

The volunteers who receive good support from their organization, have more motivation and positive attitude in work. Organizational support has different aspects such as logistic, educational, spiritual, psychological and legal support. Volunteers who work in the humanitarian field need enough motivation to do their job well, so organizational support can help them and increase their motivation. Humanitarian organizations should support volunteers in various ways such as providing adequate safety and security, equipment in order to enhance their resiliency and achieve better outcomes in the missions (27).

Individual factor was the second subject in this scale, which contained 8 items. Physical, mental, spiritual health and knowledge, experience and motivation can improve the performance of volunteers (26, 28). Furthermore, having management skills and professional competencies are

especially important for humanitarian aid workers. These results are consistent with the finding of a number of studies (29). Bjerneld also concluded that professional competency had an important role in the resiliency of volunteers (30). Spirituality and religion can help people to adapt with stress in a disaster scene. Thus, trust in God as well as focusing on spirituality are very effective strategies of stress management and increase of resiliency at the time of disasters (31).

The third factor was organizational planning, which included 6 items and reported by previous studies (27). Bjerneld concluded that ineffective planning and support could increase the likelihood of depression (30). Selection of competent leaders who have management and leadership skills in missions, providing proper education and training for volunteers and implementing specific leadership training have important effects on the resilience of personnel (32). Replacing personnel before exhaustion is an important issue in organizational planning, which can enhance the resilience of humanitarian aid workers (2).

Social support was the fourth factor in this scale which contained 5 items. Social support has various aspects such as family, community, media, and team member's supports. This factor is an essential category of resilience that has a positive correlation with the mental state of personnel (33). Ebadi concluded that social support could improve the resilience of EMS personnel (26). Supports received from family, society or media can increase the self-esteem of personnel and improve their performance (34). Cardozo concluded that lower levels of psychological distress, depression and burnout were significantly associated with social supports. (8).

The fifth factor in this scale was teamwork which contained 3 items. Team work has a positive effect on organizational and individual outcomes. A low level of resiliency can be related to insufficient intra-team connection (35). Leader and members of teams should learn effective strategies to support their peers. Accordingly, other studies suggested that teamwork, as well as strong sense of community, can be major protective factors for disaster workers, and they should have good communication with other team members (36).

The sixth factor was the challenges of the disaster scene, which contained 4 items. Different challenges in disasters can increase the stress of aid workers and decrease their resilience (3). Thus, humanitarian organizations need to identify these factors and reduce them to improve the motivation of aid workers. These findings are consistent with the finding of the Froutan study which reported job-related stress factors in EMS (31).

The questionnaire was developed for the Iranian context and thus, it may be generalized to some similar contexts. In addition, we did not implement confirmatory factors

analysis to determine the cut-off points

Conclusion

The results showed that the Humanitarian aid worker resilience scale (HAWRS) has suitable psychometric properties. This specific self-report questionnaire can be used by managers and organizations for assessing the resiliency of their volunteers. Accordingly, it is highly suggested that volunteers with low resilience levels should be avoided to dispatch to any mission by humanitarian organization managers to prevent any negative effect. The educational program is advised to improve the resiliency of volunteers who suffer from the low levels of resiliency at the disaster scene.

Ethical statement

This study was approved and affirmed by the Ethics Committee of the Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1396.208), Tehran, Iran. Participants were personally informed regarding the objectives of the study, anonymity of their information, and their ability to either participate in or withdraw from the study.

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Conflict of Interests

The authors declare that they have no competing interests.

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Appendix 1. Humanitarian aid workers resilience scale

Never	Rarely	Some times	Often	Always	
					Crowds have negative impact on my performance
					Insecurity at the scene of disaster prevents doing my job
					Stress of encounter with disaster scene has negative impact on my performance
					At the scene of the disaster, the bad behavior of the injured person, disappoint me
					I believe in my personal capabilities
					I have received the necessary education for dealing with stress in disasters scene
					I like teamwork
					I can communicate well with team members
					I forget bad memories of the mission, with the help of the methods I have learned
					I use relaxation techniques to reduce stress
					I am consulting with others in the face of stress
					In the face of problems in disaster scene, prayer gives me relief
					The organization chooses competent individuals as leaders in the missions
					The organization has plans to deal with the crisis
					The organization provides food and facilities for volunteers at the missions
					Reinforcements arrive on time in missions
					The organization has plans for preparing volunteers before the mission
					Professional training will be performed for the volunteers
					The experiences of the volunteers are important to the authorities of the organization
					Creating motivation (competitions, trips...) is a part of the authorities plans
					Psychological support (before, during and after missions) will be presented to volunteers
					Up-to-date facilities and equipment will be available for the volunteers
					The organization provide Complete information of the mission to volunteers
					The volunteers support each other
					The volunteers have friendly relationships together in missions
					Teamwork is being done on mission
					My family agrees with my presence in the missions
					My family supports me when I'm on missions
					Communicating with my family while on missions gives me positive energy
					The media supports volunteers activities
					The people appreciate the volunteers