Psychosocial support after natural disasters in Iceland-implementation and utilization

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ABSTRACT

Introduction: To date, increased attention has focused on how early psychological support after trauma may reduce suffering and limit the chronicity of psychological problems such as posttraumatic stress disorder (PTSD). However, few studies have assessed the reach or effectiveness of post-disaster interventions. The population of Iceland is frequently exposed to natural disasters and since 1995 extensive psychosocial support has been provided to disaster survivors in the country. The aim of this study is to assess the implementation, utilization, and perception of psychosocial support offered in the wake of three natural disasters in Iceland and to assess the association between utilization of support and PTSD symptoms.

Method: Three population-based studies on inhabitants affected by avalanches in 1995 (n = 399), an earthquake in 2008 (n = 1301) and a volcanic eruption in 2010 (n = 1615) were utilized. Follow-up time varied from 2 months post-disaster (earthquake) to 16 years post-disaster (avalanches). Questionnaire data was used in all three cohorts to assess utilization of psychosocial support and psychological morbidity. Response rate in the studies ranged from 71% to 82%. PTSD symptoms were assessed with validated measurement tools in all studies. Pearson’s chi-square tests were used to compare utilization and perception of psychosocial support with regard to PTSD symptoms.

Results: Utilization of psychosocial support varied between disaster cohorts (16% after the 2008 earthquake; 26% after the 2010 eruption and 37% after 1995 avalanches). Satisfaction with support increased over the years, with 53% of respondents reporting being satisfied or very satisfied with the support after the 1995 avalanches; 68% after the 2008 earthquake and 82% after the 2010 eruption. Only in the disaster cohort with the shortest follow-up time (2 months) were PTSD symptoms negatively associated with utilization of psychosocial support (earthquake cohort; p < 0.000).

Conclusions: The Icelandic national plan for psychosocial support has developed considerably since services were first formally offered in 1995. Results indicate that satisfaction with received psychosocial support has increased among disaster-affected populations from 1995, when services were first offered, to the year 2010, after the psychosocial plan had undergone substantial improvements. Furthermore, utilization of psychological support appears to be contingent on the severity of the disaster. Further studies are needed to assess the effectiveness of coordinated empirically informed assistance.

1. Introduction

Disasters can have detrimental consequences at the individual and community level, altering the infrastructure of societies and causing both physical and psychological suffering among those affected. Disasters are fairly common events, with an estimated 10–17% of individuals experiencing them in their lifetime [1,2]. Disasters often affect large geographical areas and therefore the lives of many. In the
year 2014, 324 disasters were documented worldwide, with an estimated 140.8 million people affected, many of them children [3].

1.1. Psychological morbidity post-disaster

Previous disaster studies have shown that a large proportion of early post-disaster psychological distress resolves in the first few months after disasters [4,5]. There are however considerable individual differences in psychological reactions to trauma, with a subset of survivors experiencing persisting psychological morbidity in the long-term [6,7]. Early interventions can therefore be an important asset in identifying those at greatest risk of persistent mental health problems [8].

One of the most common psychological disorders post-disaster is post-traumatic stress disorder (PTSD) [9]. PTSD symptoms have been characterized by a failure to recover from a stress reaction following exposure to a traumatic event [2], causing clinically significant distress or impairment in important areas of functioning [10]. The prevalence of PTSD after natural disasters ranges from 4% to 60% among adult survivors [4,11] and tends to be higher among direct disaster victims (e.g. those who are close to the epicenter of the event, sustain injuries, lose a loved one or suffer economic loss) than indirect victims (30–40% vs. 5–10% respectively) [4]. The onset of PTSD predominantly occurs immediately after the trauma [10]. It is therefore important that professionals providing psychosocial support identify those experiencing PTSD symptoms, provide them with adequate follow-up and refer them to treatment if symptoms do not subside.

Research indicates that only a minority of disaster survivors experiencing psychological morbidity seeks treatment [9], highlighting the importance of identifying sensitive subgroups in the aftermath of disasters. One of the main aims of psychosocial support following disasters is to target high-risk groups, that is those who are at increased risk of developing PTSD and other adverse symptoms in the aftermath of trauma [12]. By integrating mental health into emergency and medical response in disaster-stricken communities, those at greatest risk of persistent morbidity can be targeted for early intervention.

1.2. The case of Iceland

Iceland is a remote island of approximately 332 thousand inhabitants, located on the Mid-Atlantic ridge. The country is prone to natural disasters such as avalanches and landslides, volcanic eruptions and earthquakes. In the time period 1900–2008, sixty-eight natural disasters were documented in the country [13]. The frequency of natural disasters in Iceland provides a unique opportunity to assess the structure and content of the psychosocial support offered as well as the development of the psychosocial plan over the past decades. Therefore, the aim of this paper is to assess the implementation of psychosocial support after major natural disasters in Iceland (i.e. avalanches, an earthquake and volcanic eruption) by providing a historical overview of the psychosocial support offered by the Department of Civil Protection and Emergency Management (DCPEM). In addition, utilizing population-based data collected among three exposed cohorts, to examine how individuals living in the affected areas utilized and perceived the psychosocial support offered.

1.3. The Icelandic multi-disciplinary model

In the summer of 2000, two earthquakes struck South Iceland within days of each other. An in-depth analysis of the psychosocial support offered after the earthquakes revealed that no systematic organizational plan for psychosocial support was in place at a national level [14]. Three months after the earthquakes, 33% of children in the area hardest hit by the earthquakes showed moderate to severe PTSD symptoms [15]. Of adults affected by the earthquake, 24% were found to have PTSD symptoms three months post-disaster. However, the generalizability of the latter study is limited by a low response rate of 35% [16].

After the earthquakes in 2000, the Department of Civil Protection and Emergency Management (DCPEM) in Iceland began developing a comprehensive plan for psychosocial support following disasters in collaboration with key institutions. The plan, which was ratified in 2008, builds on the experience after avalanches in the Westfjords in 1995 and the earthquakes in 2000.

The psychosocial plan is based on research [17,18] and recommendations by the World Health Organization’s evidence-informed guidelines [19,20]. In addition, the plan builds on methods recommended by the National Child Traumatic Stress Network and the National Center for PTSD in assessing and providing psychosocial needs in a safe manner [21]. In accordance to recommendations, the goal of the DCPEM psychosocial support plan is to reduce the initial distress caused by traumatic events and to foster short- and long-term adaptive functioning and coping. The psychosocial support also incorporates information and education about common symptoms post-disaster such as anxiety and PTSD as well as information on where to get help.

The National Commissioner of the DCPEM is responsible for implementing the plan during disasters. The DCPEM psychosocial support plan consists of instructions and outlines for a response plan in all police districts. Every police district makes their own version of the plan based on local conditions, applicable to all types of disasters. The plan is updated regularly based on new knowledge, experience, and quality management.

In 2010, a revised plan was ratified, taking into account the experience of first aid care offered after the earthquake in 2008 and the Eyjafjallajökull volcano eruption in 2010. The revised version specifies who offers psychological first aid and how the collaboration between different sectors is conducted. Today, the Civil Protection Department, the Icelandic Directorate of Health, the Icelandic Police, the Evangelical Lutheran Church of Iceland, the Icelandic Red Cross, the municipal governments and the National Trauma Center at Landspítali University Hospital of Iceland collaborate in providing psychosocial support aid to victims after disasters in Iceland. The group is specialized in psychological support and has the role of strategic planning and formulation of psychosocial management in disasters and mass trauma. It is only activated during mass trauma or natural disasters to coordinate the support needed in the disaster area and acts as a counsel to the coordination group in the disaster area.

A key factor in the aftermath of disasters is utilizing available resources in the community and building on local capacities, to encourage sustainability. When a disaster strikes, the Red Cross opens a crisis center in the area hit. Individuals who come to the shelters are offered psychological first aid, which includes i.e. physical and emotional comfort, connecting survivors to social support networks, supporting adaptive coping and providing information to survivors. In addition, risk and resilience factors are assessed in order to identify factors that may hinder successful recovery.

1.4. Development of psychosocial service in Iceland

This paper focuses on three major natural disasters in Iceland and the development, as well as the implementation and perception of the psychosocial national plan in the wake of these events.

1.4.1. Avalanches in 1995

Psychosocial support was offered for the very first time by the DCPEM in Iceland after catastrophic avalanches in the Westfjords in 1995. The avalanches fell without warning in the small towns of Flateyri and Sudavik. The avalanche in January fell in Sudavik, destroying 16 houses and taking the lives of 14 inhabitants, thereof 8 children. The avalanche in Flateyri fell in late October of the same year, destroying 33 houses in which 54 people were sleeping and taking the lives of 20 people, thereof 5 children [22]. In all, 34 lives were therefore lost in these two neighboring villages in one year.
After the disaster, work groups were founded on behalf of the government and professionals were shipped to the disaster area. In addition, psychologists, psychiatrists, priests, nurses and locals from the villages provided psychosocial support in shelters, homes, schools, hospitals and at the Red Cross in Reykjavik.

The avalanches had profound effects on the communities. The vast majority of residents in Flateyri reported experiencing anxiety and/or helplessness (87%) and someone close to them dying or sustaining injuries (83%) when assessed 3 months post-disaster [23]. Furthermore, approximately 40% of survivors of the avalanches were experiencing PTSD symptoms 3–14 months later [24]. In a follow-up study, we found that 16% of survivors were experiencing PTSD symptoms specific to the avalanches, 16 years post-disaster [7]. In reports written shortly after the tragedies, emphasis was placed on providing further services to survivors [24].

Two years after the avalanches fell, in 1997, the Icelandic Directorate of Health appointed a committee to form a plan about the coordination of psychosocial support in Iceland. In the next years, information about psychosocial support was added to academic curriculum among professionals in the health sector and educational material was made for the public. In 2002, a parliamentary resolution was passed stating that the government, in collaboration with local authorities, should organize psychosocial support in municipalities in times of crisis. Since the avalanches fell, substantial improvements have thus been made in the national planning of psychosocial support following disasters.

1.4.2. Earthquake 2008

In 2008, detailed guidelines for municipalities in Iceland were published providing information about emergency management after natural disasters as well as the restoration and rebuilding of communities. Included in these guidelines was an overview of the DCPEM psychosocial support plan [25]. Coincidentally, days after these guidelines were published, an earthquake of magnitude 6.3 hit an area in South Iceland was approximately 15 thousand people lived. Luckily, no inhabitants lost their lives and few suffered injuries. The earthquake caused however significant damage to 2000 buildings and some roads and bridges and deeply affected many of those exposed. In a prospective study of inhabitants of communities struck by this earthquake, we found a reduction only in anxiety symptoms between two and twelve months post-disaster, with PTSD and depressive symptoms remaining fairly constant across time; indicating a chronicity of symptoms [26].

The primary goal of the psychosocial support plan after the earthquake was to facilitate collaboration between key organizations, offer empirically informed psychosocial support during the first weeks after the earthquakes and to facilitate collaboration between key local institutions during the long-term follow-up [19]. Two psychosocial coordination groups collaborated in implementing the plan: a coordination group in the Coordination and Command Center of the Civil Protection in Reykjavik and a coordination group in the police district of the disaster area. The implementation of psychosocial support included offering support in an earthquake crises center in the disaster area, heavily advertised in the local media, newspapers and in open information meetings held regularly during the first week after the earthquake.

Individuals who were experiencing difficulties or were interested in formal support were encouraged to seek assistance at the center and mental health professional provided psychosocial support, available during opening hours the first two weeks after the earthquake, and then services decreased along with demand for support.

1.4.3. Volcanic eruption in 2010

Since the South Iceland earthquake in 2008, the psychosocial plan has been implemented twice to date: after volcanic eruptions in Eyjafjallajokull in 2010 and again in 2011.

The eruption of the Eyjafjallajokull volcano in the spring of 2010 resulted in direct ash fall estimated at around 250 million tons. The ash fall was persistent for about six weeks, with the rural areas in South Iceland most severely affected. Hundreds of inhabitants had to be evacuated from the disaster area three times during this period, due to, e.g. risk of flash floods. Psychosocial support was offered to many inhabitants, particularly children, many of whom were distraught by the loud explosions from the eruption. In a study assessing the effect of the Eyjafjallajokull eruption in 2010 on inhabitants of communities near the volcano, we found high exposure levels to be positively associated with PTSD symptoms 6–9 months post-disaster [27]. A follow-up study found that PTSD symptoms among the exposed group decreased between 2010 and 2013, while the prevalence of psychological distress and perceived stress remained similar [28].

To date, few studies have assessed the reach or effectiveness of post-disaster interventions. Since 1995, extensive and costly psychosocial support has been provided to disaster survivors in Iceland, as reviewed above. Combining three population-based studies conducted on the populations affected by two avalanches in the Westfjords in 1995 (n = 399), an earthquake in South Iceland in 2008 (n = 1068) and a volcanic eruption in 2010 (n = 1615), we aim to examine how individuals living in the affected areas utilized and perceived the psychosocial support offered (see Fig. 1). In addition, we aim to examine whether survivors who are experiencing disaster-related PTSD symptoms at follow-up had sought psychological support immediately post-disaster.

2. Methods

This study consists of three separate data collections of inhabitants in Iceland exposed to (1) avalanches (2) an earthquake and (3) a volcanic eruption. Questionnaire data was used in all three cohorts to assess utilization of psychosocial support and psychological morbidity. In all data collections, participants received a phone call inquiring about willingness to participate. Those who verbally agreed to participate then received a questionnaire via email or postal mail. A few weeks later, participants received a message via email or postal mail thanking those who had participated and reminding those who had not returned the questionnaire to do so. Detailed information about the data collection and methodology for each cohort can be found in previous articles published about these studies [7, 26, 28, 29]. An overview of key methodological factors in these studies is provided in Table 1.

The Icelandic National Bioethics Committee and the Icelandic Data Protection Authority approved all research projects assessing the avalanche, earthquake and volcanic eruption cohorts.

2.1. Statistical analysis

Descriptive analyses were conducted to examine characteristic factors across the cohorts as well as the utilization and perception of psychosocial support received after the disasters. We used Pearson’s chi-square tests to compare: (1) utilization and perception of psychosocial support with regard to gender and (2) the utilization of psychosocial support with regard to disaster-related PTSD symptoms. The statistical program IBM SPSS Statistics version 20.0 (IBM Corporation, Armonk, NY, USA) was used for all statistical analyses.

3. Results

All three disaster cohorts were fairly similar with regard to background characteristics (Table 2). Approximately half of participants in all disaster cohorts were female, and the majority of participants in all cohorts were young or middle-aged adults.

3.1. Avalanches in 1995

In the avalanche cohort, 37% of participants reported having received psychological support in the first day’s post-disaster. There was
no significant difference in utilization of support with regard to gender (Table 3a). Of those who received psychosocial support, 53% reported being satisfied or very satisfied with the support; 15% were indifferent and 32% were unsatisfied with the support or very unsatisfied. The association between satisfaction of psychosocial support and gender was non-significant (Table 3a).

Of participants who received psychosocial support, 36% were experiencing avalanche-related PTSD symptoms 16 years later, compared to 64% of those who did not receive psychosocial support. However, the association between utilization of psychosocial support and experiencing avalanche-related PTSD symptoms was non-significant (Table 3b).

Additional analysis revealed that there was no statistically significant difference between the avalanche-affected towns of Sudavik and Flateyri with regard to utilization and perception of psychosocial support (data not shown). Furthermore, there was no significant difference in utilization or satisfaction of psychosocial support with regard to survivors being children or adults at the time of the disaster (data not shown).

3.2. Earthquake in 2008

In the earthquake cohort, 16% of participants reported having received psychosocial support after the earthquake; with women being significantly more likely to have utilized the support (Table 4a). Of those who received psychosocial support, 68% reported being satisfied or very satisfied with the support; 13% were indifferent and 19% were unsatisfied with the support or very unsatisfied. No difference was found between the genders with regard to satisfaction with the psychosocial support (Table 4a).

Of participants who received psychosocial support, 42% were experiencing earthquake-related PTSD symptoms 2 months post-disaster, compared to 58% of those who did not receive psychosocial support. The association between utilization of psychosocial support and experiencing earthquake-related PTSD symptoms was significant (Table 4b).
3.3. Volcanic eruption in 2010

In the eruption cohort, 26% of participants reported having received psychosocial support after the eruption. There was no significant gender difference in utilization of support (Table 5a). Of those who received psychosocial support, 82% reported being satisfied or very satisfied with the support; 5% were indifferent and 13% were unsatisfied with the support or very unsatisfied. No gender differences were found with regard to satisfaction with the psychosocial support (Table 5a).

The same proportion (50%) of participants who received psychosocial support screened positive for PTSD as those who did not receive psychosocial support. The association between utilization of psychosocial support and experiencing volcano-related PTSD symptoms was non-significant (Table 5b).

4. Discussion

This study provides unique insight into the comprehensive psychosocial support offered after three natural disasters in a modern and affluent society, with a strong infrastructure, well-controlled health care system and a nationwide social security network. The main results indicate that satisfaction with received psychosocial support has increased among disaster-affected populations from 1995, when services were first offered, to the year 2010, after the psychosocial plan had undergone substantial improvements.

4.1. Utilization and perception of support

Utilization of psychosocial support varied considerably between the disaster cohorts under study (16–37%). Our results are similar to those of Michel and colleagues, who found that the utilization of crisis intervention teams in Denmark, Sweden and Norway among Scandinavians exposed to the 2004 tsunami in Asia ranged from 12% to 39% [34].

As expected, utilization of support in our study was greatest (37%) among the respondents exposed to the most severe disaster, the avalanches in 1995, in which 34 inhabitants lost their lives. Psychosocial support was utilized less after the other two milder disasters, i.e. the 2008 earthquake and 2010 volcanic eruption (16% and 26% respectively), which fortunately did not take the lives of any. A large part of the psychosocial services is to identify those at risk of developing long-term difficulties and referring them to appropriate support. Severity of disasters has been found to be a prominent risk factor for psychological morbidity among those exposed [11]. It is therefore expected that the utilization of psychosocial support is contingent on the severity of disasters. It is therefore very important that psychosocial services be available in the aftermath of disasters, particularly when they are severe, as a greater proportion of survivors would be expected to have developed psychological morbidity and need referral to services and...
treatment. Interestingly, our results indicate that satisfaction with psychosocial support increased over the years. In 1995, 53% of survivors of the avalanches reported being satisfied or very satisfied with psychosocial support compared to 68% of the earthquake cohort and 82% of the volcanic eruption cohort. A plausible explanation for this improvement in satisfaction with services, is that since 1995, when the psychosocial support was implemented for the first time by the DCPEM, the support offered has improved considerably, building on the experience of other disasters. Regular education and training opportunities are now provided for professionals in different police districts in the country and the collaboration between different professionals and institutions providing psychosocial support following disaster has been improved considerably.

4.2. Utilization of support and PTSD symptoms

In the earthquake cohort, experiencing lower degree of PTSD symptoms 2 months post-disaster was associated with utilization of psychosocial support post-disaster. During such a short follow-up, it would be expected that those reporting notable PTSD symptoms would be those who sought support and were therefore more likely to recover. Indeed, the psychosocial support is specifically aimed at those who are having difficulties post-disaster. Furthermore, the plan emphasizes the importance of follow-up within the primary care services in the affected disaster area to monitor the development of symptoms. The current study highlights the importance of having psychological interventions available for those who do not recover by themselves. Importantly, psychosocial services should focus on activating the social network of those who lack social support post-disaster, as low social support preceding disasters and in the aftermath of disasters has been shown to be a major predictor of psychological problems [35,36].

Contrary to the results from the earthquake cohort, there was no significant difference between PTSD symptoms and utilization of psychosocial support in the avalanche and volcanic eruption cohorts, both of which had a longer follow-up period. A potential explanation of the non-significant findings in the volcanic eruption cohort is that survivors who did not seek psychosocial support had received PTSD treatment from the time of the disaster until follow-up 6–9 months later.

Regarding the avalanche cohort, there were no trauma-focused psychological therapies for PTSD available at the time of the trauma, in 1995. Unfortunately, we have no information about what resources have been available to the avalanche survivors in the past 16 years. However, as the minority of disaster survivors seek treatment for psychological problems post-disaster [9], follow-up of those affected is an important part of the psychosocial services. In the current national psychosocial plan, greater emphasis is placed on long-term follow-up and availability of trauma focused treatment for individuals who continue to report trauma related problems following the event.

4.3. Future interventions

Mental healthcare often lacks resources to meet the needs of a substantial number of people that have been affected simultaneously by a disaster. In addition, geographical barriers, such as distance to services, can limit access to support post-disaster. Internet-based interventions (IBI) can be a good alternative for disaster survivors as they can be delivered to areas where mental health services are unavailable or limited as well as being at relatively low cost. Indeed, recent research indicates that internet-based interventions are equally accessed in rural and urban areas [37].

IBI can encourage the activation of families’ social support system in the aftermath of disasters. For instance, a main focus of the web-based intervention Bounce Back Now tailored for adolescents includes a parent self-help module, with information for parents about how they can foster their relationship with their adolescent and increase communication, as well as education about common symptoms children may experience after trauma and strategies for resilience and recovery. The adolescent module includes strategies on how to establish a positive family and peer network. For those who require treatment and additional help, the internet-based intervention provides information about where to get in-person help [38].

4.4. Strengths and limitations

The main strength of this study is that it utilizes population-based cohort studies of respondents exposed to three different types of natural disaster. Through the Icelandic nationwide registers, the complete disaster stricken populations were identified. In addition, response rates ranged from 70% to 82%, therefore including the majority of survivors of these disaster-stricken communities. However, we lack information about those survivors who chose not to participate. In addition, it is possible that some individuals might be included in more than one disaster cohort. We expect that if any, these would be few cases as these disasters occurred in different areas in Iceland at separate time points. However, as these are three separate datasets and no identification numbers linking participants between studies, this cannot be assessed.

This study is further limited by utilizing studies with a retrospective design as well as self-reporting of PTSD symptoms, as opposed to relying on diagnostic interviews. Furthermore, information about the utilization of other forms of support post-disaster as well as information about whether respondents received any PTSD treatment would have complimented our study.

5. Conclusions

The Icelandic national plan for psychosocial support has improved considerably since services were first formally offered in 1995, building on knowledge from various natural disasters. A potential indicator of improved services is increased satisfaction with received psychosocial support among disaster-affected populations from 1995, when services were first offered, to the year 2010. Although knowledge on trauma recovery and implementation of psychosocial support in Iceland, as well as in other countries around the world has increased, there is still much to learn about how best to implement psychosocial support, promote recovery and prevent the development of long-term problems. As new disasters happen, the Icelandic national psychosocial plan provides opportunities to continue examination of the effectiveness of coordinated empirically informed assistance.

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References


[16] A.M. Steinberg, R.J. Ursano, Five essential elements of immediate and mid-term health e


[22] A.M. Steinberg, R.J. Ursano, Five essential elements of immediate and mid-term health e


