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Long-term health consequences of disaster a bibliography

C.J. IJzermans, A.J.E. Dirkzwager, E. Breuning



Picture on cover by **A.W. Sauter**
"Eruption of Anatahan Volcano (Northern Mariana Islands) May 10, 2003."

See: [www.margins.wustl.edu/sf/anatahan/anatahan2003 first.html](http://www.margins.wustl.edu/sf/anatahan/anatahan2003_first.html)

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<http://www.nivel.nl>

nivel@nivel.nl

Telefoon 030 2 729 700

Fax 030 2 729 729

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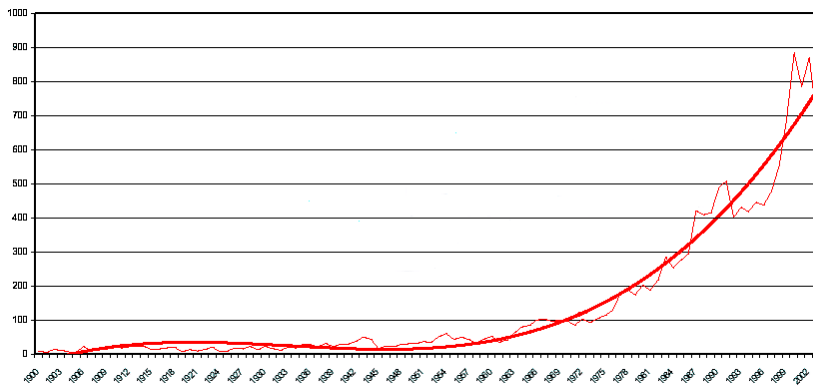
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1 INTRODUCTION

1.1 Objectives

Disasters do occur more often since the world is getting overpopulated, traffic is busier, terrorists are operating worldwide and therefore, risks are increasing. According to the CRED International Disaster Database (<http://www.cred.be>) the trend line of disasters reported started to rise in the seventies of the last century to an annual figure of almost 800 nowadays.

Figure 1 Number of disasters reported in the world (every row on the y-axis represents 100 disasters)



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Although generally self-evident, it is not always clear what exactly constitutes a disaster. Many different definitions have been used to define disasters, often using characteristics such as: a sudden onset; an event bringing great damage, loss or destruction, overwhelming institutions, health care and social resources and requiring a long time to recover; a disruption that exceeds the system's capacity to respond; or a collective stress situation (Bromet & Dew, 1995; Norris et al., 2002; Quarantelli, 1985; Rubonis & Bickman, 1991; Ursano et al., 2003; Merriam-Webster, 2004). In the present bibliography disasters are defined as acute, collectively experienced traumatic events with a sudden onset, and they can be both natural (e.g.

hurricanes, floods, earthquakes) and man-made (e.g. plane crashes, industrial accidents, terrorist attacks) (Norris et al., 2002; Rubonis & Bickman, 1991). In this way individual traumatic experiences such as sexual abuse, motor vehicle accidents, or residential fire accidents are not included. In addition, exposure to chronic stressful situations, for instance living near a chemical waste site, and incidents that take place in the context of an ongoing political conflict or war situation are not included as a disaster as well.

In recent years an increasing amount of attention, both from scientific and political viewpoint, is paid to disasters and their health consequences, disaster management, and disaster preparedness. In addition, nowadays more attention is paid to the question who is responsible for the disaster and to potential lessons that can be learned.

Especially after 9-11 and the tsunami around the borders of the Indian ocean there is a lot of attention for the aftermath of disasters, for (PTSD) posttraumatic stress (disorders) and (MUPS) medically unexplained physical symptoms. However, there is not much long-term research on these phenomena (with a few exceptions like Three Mile Island, which was a disaster especially because residents thought it was, the Gulf War and the Buffalo Creek dam collapse).

In the Netherlands, after the explosion of a firework depot in a residential area in the city of Enschede (May 13, 2000) the ministry of Health, Welfare and Sports initiated a longitudinal study on the health effects. Two designs were used: three cross-sectional surveys on the victims, using questionnaires and monitoring all contacts of the victims with primary health care, using the existing information systems of general practitioners, psychotherapists, occupational physicians and pharmacists. The authors of this bibliography are happy to be part of the NIVEL research team, which conducts the longitudinal monitoring studies, with both pre-disaster data and a control group. Initiating this study we wanted to get an overview of what was already known about the health consequences of exposure to disasters.

The problem with research on the health effects of disasters is that every disaster is unique and does occur in specific communities and in specific periods. The pitfall is wide open for another short-term study on PTSD (often reduced to partial PTSD or posttraumatic symptoms), without baseline data and/or controls. Some months after the disaster, society often turns its back on the victims and researchers go back to their daily routine. This bibliography tries to provide support for those who are temporarily working in the disaster-field, but more importantly tries to provide ammunition to those researchers and policymakers who deal with the disaster field for a

longer period and who want to make protocols and guidelines about how to deal with the generic aspects, especially on the health effects of disasters. It was decided to perform a literature search aiming to provide an overview of scientific studies on health consequences after disasters, which were published between 1990 and 2003. Such an overview can be used to get insight in the current scientific knowledge on this subject. By providing the results in specific categories, information can be found on the health consequences of different types of disasters and different populations. The point of departure of this bibliography was the long-term health consequences following disasters. A large number of different disasters were included, and in order to classify the documents, the following division was used:

Table 1 Classification of the studies in this bibliography

Natural disasters	N	Man-made disasters	N
Earthquakes	28	Terrorism	31
Floods	9	Airplane accidents	8
Hurricanes/Tornadoes	15	Train accidents	1
Volcanic eruptions	5	Shipping disasters	6
Avalanches	2	Oil disasters	5
Bush fires	2	Explosions, fires and collapses	12
		Nuclear disasters	8
		Chemical disasters	6
		Disasters in crowds	1
Total	61	Total	78

The classification distinguishes between natural and man-made disasters, and for each disaster type the number of included studies is presented as well. The category man-made disaster includes both intentionally caused disasters (terrorism) and disasters due to unintentional human errors. Nine additional studies were found which could not be classified in one type of disaster, these nine studies dealt with miscellaneous issues such as ethnic minorities, cross-cultural aspects, or health effects studied in the context of two or three disasters.

In this bibliography original research that was peer-reviewed is summarized. This means that books and review articles on health consequences of disasters were not included. At the end of the bibliography a number of review articles on health problems after disasters are listed separately. In addition, a list of books on disasters, trauma and health effects is presented as a suggestion for further reading.

1.2 Databases

Searches were performed for literature published in the period 1990 – 2003 in the following databases:

1. Pubmed: A version of Medline, the database set up by the National Library of Medicine of the United States, containing references to articles of approximately 4300 scientific medical journals in many different languages.
2. Psychinfo: A database containing references to articles of approximately 1300 journals, books, chapters and dissertations in different languages, in the discipline of psychology and psychological aspects in medicine and psychiatry.
3. Embase (Excerpta Medica): An international, European focussed biomedical and pharmacological database, providing access to information on medical subjects. The database covers about 4000 biomedical journals in different languages.
4. Cinahl: A database, which contains references to articles from nearly 2500 English-language journals in the disciplines of nursing and allied health care.
5. A database of approximately 1000 articles on health effects of disasters, collected by one of the NIVEL researchers (CJY); these articles were found by means of a broad network of personal contacts in the field of disaster research. Twenty articles were selected from this database, which were not found otherwise.
6. Articles available in the NIVEL library. Several members of the NIVEL disaster research group apply for documents using the NIVEL library. Several of these articles appeared to be relevant as well and five of these were selected which were not found otherwise.

1.3 Search strategy and selection criteria

The exact search strategy depended on the database in which the search was performed. Globally, the search strategy consisted of the following concepts:

1. Disasters, as defined in paragraph 1.1 (Objectives), and
2. health effects, symptoms, and mental disorders

Studies had to meet both concepts. Appendix 1 contains the exact search strategies for each database. In order to prevent too many irrelevant titles, some additional restrictions were included in the search strategy. Studies

relating to interventions such as mental health care, psychotherapy or crisis intervention were excluded. Studies containing the keywords disaster planning, relief work and fire setting behaviour were excluded as well. The search strategy was limited to references which included abstracts and concerned human beings. No limitation was used with respect to language.

After the search strategies were run, the results were evaluated based upon the abstracts to select whether the study was relevant or not. In this process of making a selection of relevant documents, the following inclusion criteria were used:

1. The document deals with a combination of a disaster and its long-term health effects. Long-term effects were defined as more than one month after the catastrophic event. This limit of one month was used because we were not primarily interested in the acute health effects of disasters (like physical injuries, lacerations, crush syndrome), furthermore symptoms of intrusion, avoidance and hyperarousal have to be present for more than a month before the diagnosis of posttraumatic stress disorder (PTSD) can be made. Health effects could be psychological, like PTSD, posttraumatic symptoms, depression or psychological distress. But the effects could also refer to physical health problems, such as medically unexplained physical symptoms (MUPS), musculoskeletal problems, or respiratory symptoms as a result of inhaling toxic substances.
2. The document is based on scientific research, i.e. journalistic articles are excluded.
3. The document is a journal article, i.e. not a book chapter, letter and so on.

It appeared that the results of the search strategies still included irrelevant references. The following criteria were used to exclude such documents:

1. The document deals with the effects of war. As mentioned in paragraph 1.1 (Objectives) incidents in the context of war are not included in the definition of disaster as used for this bibliography.
2. The document deals with traffic accidents, which were not collectively experienced.
3. Interventions studies, for instance on debriefing or psychiatric treatment.
4. Health effects which are acute or studied within one month after the disaster, like injuries treated in emergency care.
5. Preparedness to (bio)terrorism is the central theme of the document.
6. Methodology or the development of an instrument is the main theme of the document.

7. The health effects studied are too specific; for instance the study deals only with leptospirosis.
8. The population under study is too specific (e.g. persons with renal failure, Crush syndrome).

1.4 Process of selecting relevant documents

The documentalist (EB) screened the first search results, which were found in Pubmed, Psychinfo, Embase and Cinahl, by judging the abstracts. Irrelevant references were excluded, based on one or more of the above mentioned exclusion criteria. However, not for every reference it was clear whether it should be included or not. In that case, a reference was evaluated as a doubtful case. The abstracts of the references, which were considered relevant or doubtful, were evaluated independently by two researchers. Afterwards, all three contributors discussed their evaluations, and based upon consensus, a final list of relevant documents was established. For those references, which were considered relevant, the complete documents were applied for. All these documents were classified according to the classification mentioned in paragraph 1.1 (Objectives) in order to see how many articles on a specific disaster were found. These documents were read by one of the researchers to make a final selection.

As far as the researcher's database (see paragraph 1.2) is concerned, the researcher himself made a first selection. All articles were evaluated by one of the researchers or the documentalist to make a final selection.

This bibliography does not pretend to give an exhaustive overview of all disaster research because some choices were made to limit the content of the bibliography. For instance, choices were made when several articles on the same study were written by the same author or same research group. In this case, choices were made for the most recent article, the most solid article, or for an overview article of the study. The latter was for instance the case with the article of Dalglish et al. (2000), in which they describe their results of six years of study on the Herald of Free Enterprise shipping disaster. When an author wrote several articles on the same disaster but described different populations, such as an article on adults and an article on children, both studies were included. Despite these selections, we feel that the reader gets an overview of important disaster research in the period 1990-2003 and will be able to find additional relevant articles of an author using the reference list of the included key articles.

1.5 Overview of the literature

The present bibliography includes 139 studies dealing with the long-term health consequences of a specific disaster, of which 61 studies relate to a natural disaster and 78 to a man-made disaster. The disasters described in these 139 studies occurred in 38 different countries, which are diverse and include the United States, Asian countries (e.g. Japan, China, India), European countries (e.g. the United Kingdom, the Netherlands, Italy, Greece, Sweden), Central and South American countries (e.g. Puerto Rico, Mexico, Colombia), countries of the former Soviet Union (e.g. Armenia, Uzbekistan), Middle Eastern countries (e.g. Israel, Kuwait) and African countries (Kenya, Cameroon). Furthermore, disasters that occurred in Australia, New Zealand, and Canada are described in the bibliography as well. Most of the studies (49) refer to disasters in the United States and 11 studies concern disasters in the United Kingdom.

The language of almost all studies is English. Two French studies (Verger et al., 2000; Bouthillon et al., 1990), two Dutch studies (Gersons et al., 2000; Drogendijk et al., 2003), one Italian (Savron & Bravi, 2000) and one Spanish (Baca et al., 2002) article were included as well.

In chapter 4, nine articles are presented which could not be classified in one type of disaster; four of these articles focus on the effects of more than one disaster and five articles deal with remaining issues. These latter articles focus for instance on the British law regarding compensation for injury in disaster survivors, on cross-cultural aspects of posttraumatic stress disorder, on medically unexplained physical symptoms after disasters and military action, on ethnicity and disasters, and on suicide after natural disasters.

Study design

When looking at the study designs of the included articles, the following picture emerges. The majority of the studies included are cross-sectional ($n = 59$; 40%) or studies with more than one (cross-sectional) measurement after the disaster ($n = 38$; 26%). Of course the effects of disasters present particular difficulties for researchers since disasters have a sudden onset and most of the time can only be studied retrospectively. This is also reflected in the studies included in this bibliography; only in 13 studies actual pre-disaster data were available (9%). These studies with pre-disaster data were a stroke of luck, and were possible because the disaster occurred between times in an ongoing study (e.g. Lin et al, 2002; Bravo et al., 1990; Alexander & Wells, 1991). In one fifth of the studies a comparison was made between disaster victims and a control group ($n = 32$; 22%). Finally, two studies had unique designs in which both pre-disaster data and data from a control group were available (Alexander & Wells, 1991; Reijneveld et al., 2003).

Three of the 139 articles received the keyword 'review' for their designs. Although actual review articles on the health problems after (several) disasters are not included in this bibliography (see paragraph 1.1), these three articles reviewed the health effects of one particular disaster and were therefore included: a review on the health consequences of the Bophal disaster (Dhara & Dhara, 2002), a review on the effects of the Chernobyl accident (Rytömaa, 1996), and a review on the medical consequences of the environmental accident in the Cornish town of Camelford (David & Wessely, 1995).

The methodological quality of disaster research is often limited by the sudden and emergency situation in which it has to take place. In the acute phase of a disaster priority is logically given to the immediate trauma response or care for victims, and not to concerns about the epidemiological study design. The disaster research summarized in the present bibliography shows that a majority of the studies did not use a control-comparison criterion, neither with pre-disaster data nor with a control group. In order to draw correct conclusions regarding the impact of a disaster on the health of those involved, the availability of some form of control criterion is of paramount importance. Without such information it is difficult to determine whether the health problems are a consequence of the disaster or that the health problems represent a normal development or level. Future disaster research should, therefore, use more solid and rigorous designs in studying the health consequences of being exposed to a disaster. Since it is not possible to plan real prospective data-collection in disaster research due to practical and ethical reasons, the most adequate method appears to be the inclusion of controls not exposed to the disaster. Another possibility is the use of pre-existing registration systems, such as archival data or electronic medical records to collect information on the health status prior to the disaster.

Populations

The majority of the studies in this bibliography examined a non specified population (n = 83; 60%). These studies investigated a general group of survivors, consisting of either adults or survivors of all ages, and containing both men and women. In 29 studies children and adolescents were examined as a special population (21%; 14 in natural disasters and 15 in man-made disasters). Remarkably few studies examined the possible health consequences for rescue workers who were involved in the aftermath of disasters: this was done in four studies on natural disasters and in ten studies on man-made disasters. These rescue workers included fire fighters, police officers, body handlers, health care workers and emergency care workers who were involved in the treatment of the victims. Furthermore, relatively

few studies focused on the health of elderly victims (5%); only two studies of man-made disasters and five studies of natural disasters. Finally, a number of other special populations were identified in the studies in the bibliography: Bromet et al. (2002) examined women following the Chernobyl accident, and mothers and employees were investigated following the Three Mile Island accident (Dew & Bromet, 1993; Bromet et al., 1990). In addition, the health of immigrants was examined after an explosion of a fireworks depot (Drogendijk et al., 2003) and after the Oklahoma City bombing (Trautman et al., 2002).

In sum, relatively few studies focused on the health effects of disasters for the rescue workers involved, the elderly and immigrants. Future research on these groups appears meaningful to further increase our knowledge on the health consequences of disasters.

Health outcomes

A large majority of the health outcomes studied in disaster research relate to the psychological and psychiatric problems met by the victims, while only a large minority of the studies focus on physical symptoms. To illustrate this statement, we counted the health outcomes studied in the 139 papers presented in this bibliography (see table 2).

More than half of the articles concern PTSD, partial PTSD and/or posttraumatic symptoms. The distinction with depression, anxiety and distress is not always clear. Thus, the articles collected for the bibliography also demonstrate that the majority of disaster research is examining the psychological health consequences. Moreover, the number of studies on psychological and psychiatric symptoms may reflect an underestimation of reality, because some papers concerning the same samples (e.g. 9-11, the Oklahoma City Bombing) and thus the same outcome measures were excluded for this bibliography. Furthermore, the percentages of the health outcome 'physical symptoms' is an overrepresentation, because this figure is heavily influenced by 10 articles on nuclear and chemical disasters, and these articles do not relate to symptoms but to diseases (i.e. cancers).

Without those, the overall percentage of studies examining physical symptoms following disasters would have been 14%.

Table 2 shows that the differences are not large between studies on natural and on man-made disasters. In the latter case there is less emphasis on depression and on general distress. Within these two disaster types we see a lot of studies on depression after earthquakes, on PTSD after airplane crashes and after terrorism (even one to three weeks after 9-11 in the open population not living in New York) and not a lot of attention to PTSD, depression or anxiety in studies concerning nuclear and chemical disasters.

Table 2 Health outcomes measured in the articles included in this bibliography

Disaster type	N	Stress/ Distress	PTSD (or symptoms)	Depression	Anxiety	Physical symptoms*
Earthquakes	28	13	18	14	7	5 (2)
Floods	9	6	5	3	1	3 (1)
Tornadoes/Hurricanes	15	8	8	3	2	2
Volcanic eruptions	5	3	1	2	1	3
Avalanches	2	2	1	-	-	-
Bushfires	2	-	1	1	-	1 (1)
Natural Disasters	61	52%	56%	38%	18%	23% (7%)
Terrorism	31	11	24	6	4	6 (1)
Airplane crashes	8	3	7	2	1	2
Train accidents	1	1	1			1
Shipping accidents	6	1	4	2	3	1
Oil disasters	5	2	5	2	2	1
Explosion, Fire	12	4	8	6	5	1 (1)
Nuclear disasters	8	5	1	1	1	5 (2)
Chemical disasters	6	3	-	1	1	5 (2)
Disasters in crowds	1	1	1	-	-	-
Man-made disasters	78	40%	65%	26%	22%	28% (8%)
All disasters	139	45%	61%	31%	20%	26% (7%)

*) Between brackets the number of articles are shown which address physical symptoms exclusively

Within the category ‘physical symptoms’ attention is drawn to symptoms of the respiratory tract (after bushfires, floods, hurricanes, volcanic gas and ash, chemical disasters, terrorism and explosions), fatigue (earthquakes and terrorism), musculoskeletal problems (earthquakes and terrorism), cancer (chemical and nuclear disasters), eye problems (bushfires, terrorism and chemical disasters), diarrhoea and peptic ulcers (earthquakes, hurricanes, bushfires and floods), skin problems (bushfires and chemical disasters), medically unexplained physical symptoms (airplane crashes and floods) and the general physical condition (earthquakes, floods, terrorism, shipping, oil, nuclear and chemical disasters).

Besides health outcomes, the articles included in the bibliography examined possible predictors or mediating factors as well. The most frequently reported are: the degree of exposure to the disaster, (resource) loss, losing ones house and relocation (after natural disasters), prior disaster experience/prior trauma, studies on non-victims, risk factors, gender, comorbidity, alcohol abuse, and attribution.

Below two important groups of health problems are summarized in more detail, based on the 139 studies included in this bibliography.

Posttraumatic stress disorder (PTSD)

Characteristic to PTSD is a perceived loss of control. The accustomed sense of security has vanished. The victim fears being struck by a new calamity. For people who experiences, witnesses or were confronted with a disaster PTSD is characterized by symptoms such as re-experiencing, persistent avoidance, persistent arousal, hypervigilance and poor concentration with a duration of more than one month. Victims are sharply alert to danger but have trouble focusing on more trivial matters. This is associated with sleep disturbances and intense fatigue. Presumably such symptoms are perpetuated by feelings of rage about what has happened and by feelings of grief – not only at the loss of loved ones, but at the destruction of a life perspective and fundamental sense of security (Yzermans & Gersons, 2002).

Although posttraumatic symptoms may decrease in course of time, even years after a disaster part of the victims may show a full-blown PTSD, as was illustrated in studies included in this bibliography. In the National Comorbidity Survey an average lifetime prevalence of PTSD of 8% was reported for residents of the United States, with a higher prevalence among women and divorced persons (Kessler et al., 1995). A high comorbidity of depression, addiction and personality disorders was reported as well.

The studies in the bibliography that examined posttraumatic stress disorder as a health outcome demonstrated that PTSD prevalence rates appear to vary from 0.6% to 43%-46% among adult survivors of disasters. This is a wide range and differences may be related to alternative methods and study designs between the studies. For instance, the 46% PTSD rate concerns PTSD at some time during a follow-up period of more than 30 years. The 43% PTSD rate was found as a current PTSD rate among survivors living in temporary shelters and pre-fabricated housing sites 10 months after an earthquake. Whereas the 0.6% PTSD rate was found six months after the 9-11 attacks among adult residents in the New York City metropolitan area. With respect to children who have been exposed to disasters the PTSD prevalence rates ranged from 7% (17 years after a flood disaster) and 8% (6-14 months after a school shooting), till about one third of probable PTSD cases seven months after a discotheque fire. The first two studies examined PTSD with a structured (clinical) interview, while the latter study used a self-report questionnaire to estimate PTSD prevalence.

Among rescue workers who were involved in the aftermath of disasters the PTSD prevalence rates varied between 2.5% (in police officers 18 months after a discotheque fire) and 21% (in fire-fighters five months after exposure

to the aftermath of an earthquake). Both studies used self-report measurements to examine PTSD prevalence rates.

Diseases, physical symptoms and medically unexplained physical symptoms (MUPS)

MUPS, frequently reported after traumatic events, are symptoms with high incidences in the general population as well. Between 60-80% of healthy individuals experience at least one MUPS in any one week, and for a substantial proportion of these symptoms no organic cause can (yet) be found (Kellner, 1987). Among new referrals to a general medical outpatient clinic and among visitors to general practice the proportion of patients with MUPS was approximately 25% (males) to 35% (females).

The “Gulf War syndrome” is classified as a Functional Somatic Syndrome (FSS), a combination of various medically unexplained physical symptoms. Other FSS’s are, for instance, chronic fatigue syndrome, fibromyalgia, multiple chemical sensitivity, the sick building syndrome, chronic whiplash, the side effects of silicone breast implants and hypersensitivity. These syndromes share similar phenomenology’s, high rates of co-occurrence, similar epidemiological characteristics and higher than expected prevalence’s of (psychiatric) comorbidity. They are more characterized by comparable non-specific, diffuse symptoms than by disease-specific, demonstrable abnormalities of structure or function.

MUPS experienced and presented to doctors in the aftermath of disasters differ from most of the MUPS experienced and presented in the open population through the element of attribution. If, for instance, victims believe their suffering is caused by the toxic agents released by the disaster (and this causal relation may be true or not), the chance is increased they attribute their symptoms. Treating these symptoms is often an impossible task for doctors.

In a few articles, opened up in this bibliography, physical symptoms were collected, but in only four of them MUPS were measured as such. Groups of symptoms collected were respiratory, musculoskeletal, skin and gastrointestinal, whereas individual symptoms collected were stiff shoulders and muscle stiffness, diarrhoea, fever, dyspnoea, acute respiratory infection, eye irritation, headache, backache and especially tiredness, fatigue, insomnia and sleeping problems.

In addition to symptoms, diseases were studied, especially after nuclear and chemical disasters. The incidence of childhood thyroid cancer increased, for instance, in the Ukraine from 0.2 to 4.0 per 100.000 in the first eight years after the Chernobyl incident. Fifteen years after the incident in Seveso relative risks for cancers increased (1.3 for all cancers, for instance 4.9 for

Hodgkin's disease) and for diabetes (2.4). In several studies an increase of hypertension was found.

We have noticed, after reading those 139 articles, that physical symptoms and diseases studied are often specifically related to the specific disaster, while the psychological and psychiatric problems are studied generically.

In sum, by far the most studies on the health consequences of disasters focused on the psychological and psychiatric health effects. The potential physical health problems after disasters are less well studied and thus less well known. The few studies that did examine physical symptoms suggest that disaster victims may also experience increased physical health problems (e.g. musculoskeletal problems, respiratory problems, fatigue). In order to increase our knowledge on the long-term health problems after disasters, future disaster research should also examine possible physical health problems, and perhaps focus on other outcome measures than on posttraumatic stress measures alone. Furthermore, it appears meaningful to increase our knowledge on the interrelationship between psychological and physical health problems after disasters. When examining chemical and nuclear disasters it is obvious to focus on physical diseases such as cancers. However, in such cases it may be meaningful to examine the psychological health status as well, since being exposed to toxic substances may also result in psychological problems such as anxiety and depression. This was for instance done in the studies of Tarabrina et al (2001) and Havenaar et al. (1999) on the consequences of the Chernobyl accident, showing that posttraumatic stress and psychological distress was rather prevalent among the exposed subjects.

Reviews

In this bibliography original research is described. This means that reviews were not included. However, for the reader who is interested in reviews on the health effects of disasters a separate chapter containing 17 review articles on disasters is presented at the end of the bibliography. These papers are very diverse and emphasize different aspects. Two of these studies concern a systematic review and a meta-analysis of health problems following disasters (Norris et al., 2002; Rubonis & Bickman, 1991), while other studies summarize the possible health effects more non-systematically. Four articles deal with children's health problems after exposure to disasters and terrorism. Other specific topics of the review articles are: biochemical terrorism, unexplained symptoms after terrorism and war, the public health consequences of disasters, factors affecting health after toxicological disasters, and acute stress disorder after disasters.

1.6 Arrangement of the bibliography and users guide

Chapters 2-5 contain the abstracts of the selected documents, which are arranged according to the classification mentioned in paragraph 1.1 (Objectives). Chapter 2 contains all the abstracts of studies concerning natural disasters, chapter 3 includes the abstracts on man-made disasters. In chapter 4 a few abstracts of documents are presented which could not be classified in one type of disaster and which deal with special issues, like ethnic minorities, cross-cultural aspects or health effects studied in the context of more than one (type of) disaster. In chapter 5, an overview is given of review articles on the health consequences of disasters. In this bibliography only journal articles were included. However, books have also been published on the effects of disasters. Therefore, in chapter 6 a number of books are suggested for further reading for those who are interested.

Following these chapters and the appendix two indexes are included. First of all an authors index is presented, containing an alphabetical list with the authors' names. Secondly, a subject index based upon keywords is presented. At the end of each document description some keywords are included. The first keyword(s) refers to the type of study design. The following keywords for study designs are used: cross-sectional study, longitudinal study (i.e. more than one measurements after the disaster), control group comparison (i.e. a control group is included); pre- post comparison (i.e. data from both before and after the disaster are available), and reviews. Following the study design, keywords are presented which refer to the population that was examined. When the study did not specify the population or when the study included victims of all ages no keyword for the population was presented. In the case a specific population was examined, the following keywords were used: children, adolescents, elderly, mothers, and rescue workers. Finally, keywords for the health consequences that were examined, and keywords like risk factors and coping are presented. Keywords such as PTSD, depression, and anxiety disorders are only assigned to studies in which a diagnosis is made by means of a structured clinical interview. Studies that used self-report questionnaires to determine the health consequences, received keywords like posttraumatic symptoms, depressed feelings and anxiousness. All documents are available in the NIVEL library.

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Yzermans CJ & Gersons BPR. The chaotic aftermath of an airplane crash in

Amsterdam: a second disaster. In: JM Havenaar, JG Cwikel, EJ Bromet (Eds.). *Toxic Turmoil: psychological and societal consequences of ecological disasters* (pp. 85-99). New York: Kluwer Academic/Plenum publishers 2002.

2 ABSTRACTS OF ARTICLES ON NATURAL DISASTERS

2.1 EARTHQUAKES

Aoyama N, Kinoshita Y, Fujimoto S, Himeno S, Todo A, Kasuga M, Chiba T.

Peptic ulcers after the Hanshin-Awaji earthquake: increased incidence of bleeding gastric ulcers.

American Journal of Gastroenterology, 1998; 93(3): pp.311-316

Hanshin-Awaji Earthquake, 1995, Hanshin-Awaji, Japan

OBJECTIVE: To examine the influence of the Hanshin-Awaji earthquake on the occurrence of peptic ulcer disease among non-injured residents. In this event, more than 6,000 people were killed and more than 25,000 injured. Over 310,000 people became at least temporarily homeless, causing great tension and anxiety. So far, it remains controversial whether emotional stress can cause peptic ulcers.

METHODS: Sixty-one hospitals, covering 70% of all endoscopy examinations performed in this area, joined the study and were divided into three areas according to severity of damage. A comparison was made between a group of 10,831 patients who underwent upper gastrointestinal endoscopy within two months of the earthquake and 16,100 who did so in the same hospitals during the corresponding period in 1994.

RESULTS: In the most devastated area, in spite of a dramatic decrease in the total number of endoscopies (50%), patients with a gastric ulcer (GU) increased in 1995, whereas those with a duodenal ulcer decreased, resulting in a higher ratio of gastric to duodenal ulcers than in 1994 (3.07 vs. 1.88). In particular, there was a marked increase in bleeding GU. The mean age of patients with GU was significantly higher in 1995 than in 1994.

CONCLUSIONS: The Hanshin-Awaji earthquake-induced life event stress not only triggered but also exacerbated GU, particularly in the elderly.

Language: English

Keywords: Control group comparison / Gastrointestinal symptoms

Fukuda S, Morimoto K, Mure K, Maruyama S.

Posttraumatic stress and change in lifestyle among the Hanshin-Awaji earthquake victims.

Preventive Medicine, 1999; 29(3): pp. 147-151

Hanshin-Awaji Earthquake, 1995, Hanshin-Awaji, Japan

OBJECTIVE: To examine the relationship between the psychological stress induced by the Hanshin-Awaji earthquake and the subsequent change in lifestyle.

METHODS: Twenty months after the disaster a sample of 108 male inhabitants of Awaji Island completed a questionnaire covering demographic variables, lifestyle (the Eight Health Practice Index; e.g. smoking, alcohol consumption, working hours per day, physical exercise) and posttraumatic stress symptoms (the PTSD symptom score which is based on the DSM-IV).

RESULTS: The mean PTSD score was higher in the disimproved lifestyle group than in the no change /better lifestyle group. Categories B or D of PTSD scores were higher in the worse lifestyle group than in the no change/better lifestyle group. The percentage of subjects who lived in temporary public housing was higher in the disimproved lifestyle group than in the no change/better lifestyle group.

CONCLUSIONS: A change for the worse in lifestyle could be associated with high PTSD scores in victims of the Hanshin-Awaji earthquake.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms

Kitayama S, Okada Y, Takumi T, Takada S, Inagaki Y, Nakamura H.
Psychological and physical reactions in children after the Hanshin-Awaji earthquake disaster.

Kobe Journal of Medical Sciences, 2000; 46(5): pp.189-200

Hanshin-Awaji Earthquake, 1995, Hanshin-Awaji, Japan

OBJECTIVE: To examine the psychological and physical reactions in children who survived the Hanshin-Awaji earthquake.

METHODS: Changes observed in the symptoms of children at one and two years after the earthquake were compared between those who had lived in a severely damaged area and those who had lived in a mildly damaged area. The survey was conducted using a questionnaire filled out by the children's

parents. For 133 parent-child pairs of the severely damaged group and 125 pairs of the mildly damaged group, information was available in both years. RESULTS: Two years after the earthquake, the children had returned to normal in terms of their physical conditions, even in the severely damaged area. However, symptoms of PTSD (Posttraumatic Stress Disorder) such as persistent re-experiencing, persistent avoidance, and increased arousal were significantly more frequent among children from the severely damaged area than among those from the mildly damaged area.

CONCLUSIONS: After large-scale disasters, evaluation of the psychological and physical reactions in children is very important in order to give the right support.

Language: English

Keywords: Longitudinal study / Children / Posttraumatic symptoms / Physical symptoms

Joh H.

Disaster stress of the 1995 Kobe earthquake.

Psychologia, 1997; 40(3): pp.192-200

Kobe Earthquake, 1995, Kobe, Japan

OBJECTIVE: To study psychological and physical stress symptoms following the Kobe earthquake, in which more than 5,500 people died, 34,000 were injured and 160,000 became homeless.

METHODS: 748 victims (aged 4 – 88 years) participated in this study, one month after the earthquake. Thirty items from the Stress Check List for Self (SCL-S) were used. The victims were analysed according to refugee conditions, gender, age and degree of damage to their houses.

RESULTS: Stress indicators ranged between 35% and 50%; e.g. 51% suffered fatigue, 49% stiff shoulders and 41% disturbed sleep. Seven percent of people living in shelters were heavily stressed; 33% experienced a medium degree of stress; 28% were slightly stressed. Of people living in facilities other than shelters, 2% were heavily stressed, 17% suffered a medium degree of stress and 23% were slightly stressed. Women in their sixties felt more severe mental and physical stress than other people. Victims with completely collapsed and partially collapsed houses experienced higher stress levels than the victims with houses needing repairs, meaning that losing a house is a great mental burden.

Language: English

Keywords: Cross-sectional study / Psychological distress / Physical symptoms / Risk factors

Armenian HK, Morikawa M, Melkonian AK, Hovanesian A, Akiskal K, Akiskal HS.

Risk factors for depression in the survivors of the 1988 earthquake in Armenia.

Journal of Urban Health, 2002; 79(3): pp.373-382

Armenian Earthquake, 1988, Armenia

OBJECTIVE: To study the rate and determinants of depression in adult survivors of the 1988 earthquake in Armenia. It was estimated that about 25,000 persons died as a consequence of this earthquake, and about half a million became homeless.

METHODS: As part of a cohort study of 32,743 survivors of the 1988 earthquake in Armenia, a stratified population sample of 1,785 persons was interviewed about two years following the disaster using a special questionnaire based on the National Institute of Mental Health (NIMH) Disaster Interview Schedule/Disaster Supplement. Fifty-two percent met the criteria for major depression. Of these, a total of 177 cases of depression with no other psychiatric diagnosis or comorbidity were compared with 583 controls from the same interviewed group who did not fulfil the criteria for any psychiatric disorder. Cases and controls were compared on a number of exposures and characteristics related to the earthquake.

RESULTS: More of the cases involved females (odds ratio [OR] for males 0.7) and came from the city of Gumri, which had some of the worst destruction (OR for residents of Gumri 5.9). Being with someone in the same building at the moment of the earthquake was protective for depression (OR for presence of other people 0.5), and the risk of depression increased with the amount of loss that the family sustained as a result of the earthquake (OR for highest level of loss 2.5). The use of alcohol was protective for depression (OR for those who drink 0.5). In various models of multivariate adjustment and analysis, the increased risk of depression with loss, geographic location, and female gender was maintained. Also, being with someone during the disaster, receiving assistance and support after the earthquake, and alcohol use were protective for depression in these multivariate analyses.

CONCLUSIONS: These findings indicate that depression is a common consequence following an earthquake. In keeping with a previous study, the intensity of the disaster and loss were related to the risk of depression in a general population sample. The role of social support during and after the

disaster as a protective mechanism against adverse psychological outcome was highlighted again. Whereas alcohol use in the previous study was not related to PTSD outcome, it is noteworthy that in the present analyses it emerged as a protective factor for depression.

Language: English

Keywords: Longitudinal study / Depression / Risk factors

Armenian HK, Morikawa M, Melkonian AK, Hovanesian AP, Haroutunian N, Saigh PA, Akiskal K, Akiskal HS.

Loss as a determinant of PTSD in a cohort of adult survivors of the 1988 earthquake in Armenia: implications for policy.

Acta Psychiatrica Scandinavica, 2000; 102(1): pp.58-64

Armenian Earthquake, 1988, Armenia

OBJECTIVE: To examine the relationship of posttraumatic stress disorder (PTSD) to loss and other personal experiences during the earthquake in Armenia.

METHODS: A sample of 1,785 adult participants in an epidemiological study initiated in the immediate aftermath of the 1988 earthquake in Armenia was interviewed about two years following the disaster. The interview was based on the NIMH DIS-Disaster Supplement, a psychiatric diagnostic interview questionnaire. All 154 cases of PTSD were compared with 583 controls without symptoms, satisfying psychiatric diagnoses of interest.

RESULTS: Those participants suffering from PTSD were more often persons from areas with the worst destruction. Having the highest level of education compared to lowest (OR 0.6), being accompanied at the moment of the earthquake (OR 0.6) and making new friends after the earthquake (OR 0.6) were protective for PTSD. The risk for PTSD increased with the total amount of loss to the family (OR for highest level of loss 4.1).

CONCLUSIONS: These findings show high rates of PTSD and a clear relationship with level of exposure. People with high levels of loss should be specially targeted for remedial and preventive actions.

Language: English

Keywords: Longitudinal study / PTSD / Risk factors

Goenjian AK, Pynoos RS, Steinberg AM, Najarian LM, Asarnow JR, Karayan I, Ghurabi M, Fairbanks LA.

Psychiatric comorbidity in children after the 1988 earthquake in Armenia.

Journal of the American Academy of Child and Adolescent Psychiatry, 1995; 34(9): pp.1174-1184

Armanian Earthquake, 1988, Armenia

OBJECTIVE: To examine posttraumatic stress symptoms, depressive symptoms, and separation anxiety disorder (SAD) among children one-and-a-half years after the 1988 earthquake in Armenia. In addition, current rates of comorbid PTSD and depressive disorder were determined and the contribution of exposure, gender, loss of family members and loss of residence to posttraumatic stress and depressive symptoms was investigated.

METHODS: Two hundred and eighteen school-age children from three cities at increasing distances from the epicentre were evaluated using the Child Posttraumatic Stress Disorder Reaction Index (CPTSD-RI), the Depression Self-Rating Scale (DSRS), and the section on SAD from the Diagnostic Interview for Children and Adolescents (DICA).

RESULTS: On the basis of these evaluations, high rates of current PTSD, depressive disorder, and their co-occurrence were found among victims residing in the two heavily impacted cities. Separation anxiety was comparatively less frequent, although symptoms had been pervasive throughout the region. Severity of posttraumatic stress and depressive reactions were highly correlated. Extent of loss of family members was independently correlated with posttraumatic stress and depressive reactions.

CONCLUSIONS: After a catastrophic natural disaster, children are at risk for comorbid PTSD and secondary depression. Early clinical intervention is recommended to prevent chronic posttraumatic stress reactions and secondary depression.

Language: English

Keywords: Cross-sectional study / Children / PTSD / Anxiety disorder / Depression / Risk factors

Chang CM, Lee LC, Connor KM, Davidson JR, Jeffries K, Lai TJ.

Posttraumatic distress and coping strategies among rescue workers after an earthquake.

Journal of Nervous and Mental Disease, 2003; 191(6): pp.391-398

Chi-Chi Earthquake, 1999, Chi-Chi, Taiwan

OBJECTIVE: To examine the prevalence rates of psychiatric and posttraumatic distress and the relationship between psychiatric and posttraumatic morbidity and coping strategies among rescue workers following an earthquake in Taiwan. This earthquake caused severe damage to property and resulted in more than 2,300 deaths and 11,000 injuries.

METHODS: Eighty-four male firefighters who had been exposed to earthquake rescue work were assessed five months after the event. The Chinese Health Questionnaire (CHQ), the Impact of Event Scale (IES), and the Ways of Coping Questionnaire (WCQ) were used to assess psychiatric morbidity, posttraumatic morbidity, and coping strategies.

RESULTS: The observed prevalence rates were 16.7% and 21.4% for general psychiatric morbidity and posttraumatic morbidity, respectively. Results from multivariate logistic regression indicated that job experience and confrontive coping were significant predictors of psychiatric morbidity, while job experience, distancing, escape-avoidance, and positive reappraisal were significant predictors of posttraumatic morbidity. Rescue workers with longer job experience were at the highest risk for developing psychiatric and posttraumatic distress.

CONCLUSIONS: The relatively high psychiatric and posttraumatic morbidity found underscores the importance of attention to the psychological impact of catastrophic events on rescue workers.

Language: English

Keywords: Cross-sectional study / Rescue workers / Posttraumatic symptoms / Psychological distress / Risk factors / Coping

Chang HL, Chang TC, Lin TY, Kuo SS.

Psychiatric morbidity and pregnancy outcome in a disaster area of Taiwan 921 earthquake.

Psychiatry and Clinical Neurosciences, 2002; 56(2): p.139-144

Chi-Chi Earthquake, 1999, Chi-Chi, Taiwan

OBJECTIVE: To study the prevalence of minor psychiatric morbidity in a group of women who were pregnant during or immediately after the Chi-Chi earthquake disaster and to investigate the prognostic factors that may have influenced the perinatal outcome of the pregnancy.

METHODS: This study took place six months after the earthquake and enrolled 171 women living in a town near the epicentre. The following self-report measures were used: Earthquake Exposure Checklist (EEC), Posttraumatic Stress Reaction Checklist (PTSRC) and a Chinese version of

the General Health Questionnaire (CHQ-12). These questionnaires were completed before delivery while the perinatal data were retrieved from hospital obstetrical records.

RESULTS: The prevalence of minor psychiatric morbidity (MPM) was 29%. Women with starvation experience, higher negative attitude scores about the influence of earthquake on pregnancy and more casualties among relatives were significantly correlated with high CHQ. A significant positive correlation between the MPM and PTSD scores was noticed. Among the 115 pregnancies with known perinatal outcome, there were nine (8%) low-birth weight neonates, defined as birth weight \leq 2500 g. Maternal history of abdominal injury, spouse casualty and instability in living condition were significantly correlated with low birth weight. Spouse casualty was the only significant factor that predicts neonatal low birth weight.

CONCLUSIONS: This study provides a clue for the relationship between pregnancy in disaster survivors and birth outcome.

Language: English

Keywords: Cross-sectional study / Women / Posttraumatic symptoms / Pregnancy / Low birth weight / Risk factors

Liao SC, Lee MB, Lee YJ, Weng T, Shih FY, Ma MH.

Association of psychological distress with psychological factors in rescue workers within two months after a major earthquake.

Journal of the Formosan Medical Association, 2002; 101(3): pp.169-176
Chi-Chi Earthquake, 1999, Chi-Chi, Taiwan

OBJECTIVE: To examine the characteristics of psychological distress and its psycho-social predictors in rescue workers within a two-month period of the Taiwan earthquake.

METHODS: A total of 1,104 rescue workers deployed after the earthquake were enrolled in the study. Psychological distress was measured using the Brief Symptom Rating Scale (BSRS), personality traits using the Maudsley Personality Inventory (MPI), and family function using APGAR (adaptability, partnership, growth, affection, and resolve) indexes. These measurements were performed within two months of the earthquake.

Univariate and multivariate analyses were applied to examine the association between psychological distress and various psychosocial factors.

RESULTS: BSRS assessment revealed severe psychological distress in 137 subjects (16%). The most common symptom dimension was phobic-anxiety (19%), followed by hostility (17%), obsessive-compulsive symptoms (16%), and depressive symptoms (15%). Pre-disaster major life events and most of

the factor scores of the MPI predicted the severity of psychological distress. Time of arrival at the scene, previous exposure, age, and family function had no or negligible predictive power.

CONCLUSIONS: The results of this study indicated that prevalence of general psychological distress is high among rescue workers in the first two months after a major earthquake. Personality traits and pre-disaster life adjustment had a significant predictive power for psychological distress.

Language: English

Keywords: Cross-sectional study / Rescue workers / Psychological distress / Depressed feeling / Anxiousness / Risk factors

Lin MR, Huang W, Huang C, Hwang HF, Tsai LW, Chiu YN.

The impact of the Chi-Chi earthquake on quality of life among elderly survivors in Taiwan: a before and after study.

Quality of Life Research, 2002; 11(4): pp.379-388

Chi-Chi Earthquake, 1999, Chi-Chi, Taiwan

OBJECTIVE: To examine the impact of the Chi-Chi earthquake in Taiwan on the quality of life among elderly survivors.

METHODS: The 28-item Taiwanese-adapted brief version of the World Health Organization's quality of life questionnaire (WHOQOL-BREF) was used to measure quality of life in four domains: physical capacity, psychological well-being, social relationships, and environment. These measures were coincidentally collected in a separate study from 368 subjects aged 65 and older in the affected area shortly before the earthquake. Of these subjects, 268 were interviewed in a follow-up assessment 12 months after the earthquake. Linear mixed models were applied to investigate how quality of life in each of the four domains changed from the pre-earthquake assessment to 12 months after the earthquake, and to what extent these changes depended on the level of damage to residences.

RESULTS: Scores in all domains declined from the pre-earthquake assessment to 12 months after the event, except in social relationships and environment among the elderly whose residences completely collapsed. Scores for physical capacity declined by 2.1 points among the elderly whose residences did not collapse. Elderly survivors tended to report lower quality of life in physical capacity, psychological well-being, and environment 12 months after the earthquake than at the assessment prior to the earthquake, regardless of the level of damage to their residences during the earthquake. However, those whose residences completely collapsed during the earthquake reported a higher quality of life in social relationships 12 months

after the earthquake than before the event while others reported a lower quality of life in social relationships.

CONCLUSIONS: Having experienced an earthquake affected the quality of life among elderly survivors, compared to pre-disaster data. The quality of the lives of those who lost their personal belongings even got worse.

Language: English

Keywords: Pre-post comparison / Elderly / Quality of life

Fuente R de la.

The mental health consequences of the 1985 earthquakes in Mexico.

International Journal of Mental Health, 1990; 19(2): pp.21-29.

Earthquake, 1985, Mexico City, Mexico

OBJECTIVE: To describe the results of two studies on the emotional reactions in survivors of the earthquakes in Mexico City, in which several thousand people died and many more became homeless. Both studies focused on persons housed in shelters.

METHODS: The first study included 573 people (aged 18-64 years; 23% men and 69% women) , the second study included 208 women housed in shelters. The sample of the first study was interviewed over a period of 10 weeks, using a questionnaire which evaluated four conditions as defined in the DSM-III: posttraumatic stress disorder, panic disorder, generalized anxiety and depression. The methodology used in the second study is not described.

RESULTS: Thirty-two percent of the subjects in the first sample displayed posttraumatic stress disorder (PTSD), 19% had generalized anxiety, and 13% depression. In the second sample 72% showed no psychopathological symptoms, 18% displayed some signs of decompensation, and 9% suffered severe decompensation.

CONCLUSIONS: These results show that the disaster had far reaching psychological effects, that extended to the population not directly affected by the earthquakes.

Language: English

Keywords: Cross-sectional study / PTSD / Anxiety disorder / Depression

Asarnow J, Glynn S, Pynoos RS, Nahum J, Guthrie D, Cantwell DP, Franklin B.

When the earth stops shaking: earthquake sequelae among children diagnosed for pre-earthquake psychopathology.

Journal of the American Academy of Child and Adolescent Psychiatry, 1999; 38(8): pp.1016-1023

Northridge Earthquake, 1994, Los Angeles, United States

OBJECTIVE: To examine risk factors for posttraumatic stress reactions following the Northridge earthquake among youths diagnosed with pre-existing psychopathology. This disaster resulted in 72 deaths and more than 11,000 injuries.

METHODS: One year after the earthquake, symptoms of posttraumatic stress disorder (PTSD), depression, general anxiety, and social impairment were evaluated using telephone interviews among 66 children participating in a family-genetic study of childhood-onset depression at the time of the earthquake.

RESULTS: Significant predictors of PTSD symptoms one year after the disaster included perceived stress and resource loss, a pre-disaster anxiety disorder, and more frequent use of cognitive and avoidant coping strategies. PTSD symptoms were associated with high rates of concurrent general anxiety symptoms, depressive symptoms, and social adjustment problems with friends. Significant correlations were found between siblings' reports of objective exposure.

CONCLUSIONS: Pre-existing anxiety disorders represent a risk factor for post-disaster PTSD reactions. Post-disaster services need to attend to the needs of these youths as well as those experiencing high levels of subjective stress, resource loss, and/or high exposure. The fact that children within families show significant variation in post-disaster reactions underscores the need for attention to individual child characteristics and unshared environmental attributes.

Language: English

Keywords: Pre-post comparison / Children / Posttraumatic symptoms / Anxiousness / Depressed feeling / Risk factors

Knight BG, Gatz M, Heller K, Bengtson VL.

Age and emotional response to the Northridge earthquake: a longitudinal analysis.

Psychology and Aging, 2000; 15(4): pp.627-634

Northridge Earthquake, 1994, Los Angeles, United States

OBJECTIVE: To study the influence of ageing on stress reactions in survivors of the Northridge earthquake. The authors tested two different explanations for earlier findings that older adults have lower levels of emotional distress after natural disasters. The maturation hypothesis argues that older adults are less reactive to stressful events, whereas the inoculation hypothesis contends that prior experience with disaster is protective.

METHODS: One hundred and sixty-six adults aged 30 to 102 were interviewed 9 to 14 months following the event. Longitudinal data were available on depressed mood before and after the earthquake, measured by the Center for Epidemiologic Studies-Depression scale (CES-D).

RESULTS: The maturation hypothesis was generally not supported. Those aged 55-75 years had the least depression; however, this age-related difference was present prior to the earthquake. The older age range (76 years and older) showed the lowest levels of earthquake-specific rumination, but age did not buffer the relationship between damage exposure and rumination. The inoculation hypothesis was supported for depressed mood. Prior earthquake experience was related to lower post-earthquake depression scores.

CONCLUSIONS: These results show that there are age effects in response to natural disasters; a lower level of distress was found among older adults, but this apparent resilience seemed to be related to a better pre-disaster functioning. Virtually no support was found for the maturation hypothesis, and modest support was found for the inoculation hypothesis, with respect to depression.

Language: English

Keywords: Pre-post comparison / Longitudinal study / Elderly / Depressed feeling

McMillen JC, North CS, Smith EM.

What parts of PTSD are normal: intrusion, avoidance, or arousal? Data from the Northridge, California, earthquake.

Journal of Traumatic Stress, 2000; 13(1): pp.57-75

Northridge Earthquake, 1994, Los Angeles, United States

OBJECTIVE: To study the incidence and comorbidity of posttraumatic stress disorder (PTSD) in survivors of the Northridge earthquake.

METHODS: A sample of 130 survivors was interviewed three months after the event. The Diagnostic Interview Schedule/Disaster Supplement was used to measure seven DSM-III-R diagnoses.

RESULTS: Only 13% of the sample met full PTSD criteria, but 48% met both the re-experiencing and the arousal symptom criteria, without meeting the avoidance and numbing symptom criterion. Six out of 16 persons with post-disaster PTSD had another post-earthquake psychiatric disorder, and six of 23 persons with a non-PTSD disorder also had PTSD. Psychiatric comorbidity was associated mostly with avoidance and numbing symptoms.

For moderately severe traumatic events, re-experiencing and arousal symptoms may be the most "normal," and survivors with a history of psychiatric problems may be those most likely to develop full PTSD.

CONCLUSIONS: A system that considers people who meet all three symptom criteria to have a psychiatric disorder yet recognizes the distress of other symptomatic survivors may best serve traumatised populations.

Language: English

Keywords: Cross-sectional study / PTSD / Mental disorders / Comorbidity

Marmar CR, Weiss DS, Metzler TJ, Ronfeldt HM, Foreman C.

Stress responses of emergency services personnel to the Loma Prieta earthquake Interstate 880 freeway collapse and control traumatic incidents.

Journal of Traumatic Stress, 1996; 9(1): pp.63-85

Loma Prieta Earthquake, 1989, San Francisco, United States

OBJECTIVE: To study stress responses in rescue workers following the Loma Prieta earthquake, in which 62 people died and more than 3,700 were injured.

METHODS: One-and-a-half years after the event, a three-group quasi-experimental design was used to compare the responses of rescue workers who were exposed to the earthquake (n = 198) with two control groups (n = 140 and n = 101). Measures used were the Incident Exposure Scale, Peritraumatic Emotional Distress Scale (PEDS), Peritraumatic Dissociative Experiences Questionnaire (PDEQ-SV), the Impact of Event Scale (IES) and the SCL-90. Work and interpersonal functioning were assessed by the number of sick days and the Social Adjustment Scale – Self Report.

RESULTS: The study group reported higher exposure, greater immediate threat appraisal, and more sick days than both control groups. The three groups did not differ with respect to current posttraumatic, general distress and somatisation symptoms. For the sample as a whole, paramedic

professionals reported higher peri-traumatic dissociation and more social adjustment difficulties compared with police. Paramedic professionals and road workers were more symptomatic than police personnel on the hyper-arousal scale and SCL-90 scales. Nine percent of the sample were characterised as having symptom levels typical of psychiatric outpatients. Compared with lower distress responders, those with greater distress reported greater exposure, greater peri-traumatic emotional distress, greater peri-traumatic dissociation, greater perceived threat, and less preparation for the critical incident.

CONCLUSIONS: These results underscore the importance of training emergency services personnel to anticipate and cognitively manage the emotionally disturbing experiences that occur in critical incident work.

Language: English

Keywords: Control group comparison / Rescue workers / Posttraumatic symptoms / Psychological distress / Risk factors

Nolen-Hoeksema S, Morrow J.

A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta earthquake.

Journal of Personality and Social Psychology, 1991; 61(1): pp.115-121

Loma Prieta Earthquake, 1989, San Francisco, United States

OBJECTIVE: To study the emotional reactions and risk factors for depression and posttraumatic stress following the Loma Prieta earthquake.

METHODS: A prospective study was conducted, in which measures of emotional health and styles of responding to negative moods were obtained for 137 students 14 days before the earthquake. A follow-up was conducted 10 days and again seven weeks after the earthquake to test predictions about which students would show the most enduring symptoms of depression and posttraumatic stress. Measures used were the Interview to Diagnose Depression (IDD), the Response Styles Questionnaire (RSQ) and some additional questions on ruminations about the earthquake, coping and stress resulting from the disaster.

RESULTS: Regression analyses showed that students who, before the earthquake, already had elevated levels of depression and stress symptoms and a ruminative style of responding to their symptoms had more depression and stress symptoms for both follow-ups. Students who were exposed to more dangerous or difficult circumstances because of the earthquake also had elevated symptom levels 10 days after the earthquake. Similarly, students who, during the 10 days after the earthquake, had more ruminations

about the earthquake were still more likely to have high levels of depressive and stress symptoms seven weeks after the earthquake.

CONCLUSIONS: These results indicate that a ruminative style of responding to depressed mood is a predictor of how long such negative emotions endure. It is argued that suppression of feelings would not help to relieve a negative mood, whereas engaging in distractions or other activities can decrease ruminative response patterns.

Language: English

Keywords: Pre-post comparison / Depression / Posttraumatic symptoms / Risk factors

Başoğlu M, Şalcioğlu E, Livanou M.

Traumatic stress responses in earthquake survivors in Turkey.

Journal of Traumatic Stress, 2002; 15(4): pp.269-276

Marmara Earthquake, 1999, Marmara, Turkey

OBJECTIVE: To examine the extent of posttraumatic stress and depressive symptoms and associated risk factors in survivors of the Marmara earthquake. In this event, more than 17,000 people died and about 24,000 were injured.

METHODS: A group of 1,000 people from three camps and two pre-fabricated housing sites in the epicentre region was assessed using the Screening Instrument for Traumatic Stress in Earthquake Survivors (SITSES). The assessment was conducted on average 10 months after the disaster.

RESULTS: The estimated rates of PTSD and major depression were 43% and 31%, respectively. Traumatic stress symptoms were related to more intense fear during the earthquake, female gender, having been trapped under rubble, death of a family member, past psychiatric illness, having participated in rescue work, and lower education.

CONCLUSIONS: These high rates of posttraumatic and depressive symptoms, nearly one year after the disaster, suggest a chronic course. Avoidance of trauma reminders was the most common symptom and needs special attention in survivor care because of its mental health, social, and economic implications.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Depressed feeling / Risk factors

Kiliç C, Ulusoy M.

Psychological effects of the November 1999 earthquake in Turkey: an epidemiological study.

Acta Psychiatrica Scandinavica, 2003; 108(3): pp.232-238

Marmara Earthquake, 1999, Marmara, Turkey

OBJECTIVE: To study posttraumatic symptoms and related factors in residents of two towns affected by the 1999 earthquakes in Turkey. In the first earthquake, 18,000 people died. The second earthquake took place about three months later, killing 832 people.

METHODS: A total of 430 people in selected households were seen 18 months after the earthquake. They were given a self-report questionnaire assessing posttraumatic and depressive symptoms, demographics and trauma exposure.

RESULTS: The rates of PTSD and depression were higher in the site closer to the epicentre (for PTSD: 42% versus 19%; for depression: 28% versus 12%). The traumatic stress symptom checklist scores were predicted by fear during earthquake, loss of friends and neighbours, female gender, lower education and living in rented accommodation. Depressive symptoms were predicted by exposure, death of relatives and past psychiatric illness.

CONCLUSIONS: These results show that severe earthquakes can cause long-lasting morbidity, and suggest different risk factors for depressive and traumatic stress symptoms.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Depressed feeling / Risk factors

Karanci AN, Rustemli A.

Psychological consequences of the 1992 Erzincan (Turkey) earthquake.

Disasters, 1995; 19(1): pp.8-18

Earthquake, 1992, Erzincan, Turkey

OBJECTIVE: To study the long-term psychological after-effects of the 1992 Erzincan earthquake, in which 541 people died and 850 were injured.

METHODS: Four hundred and sixty-one residents of Erzincan were administered a semi-structured interview, 16 months after the disaster.

Emotional distress was measured by the SCL-90. A comparison group consisted of 129 non-exposed subjects from Ankara.

RESULTS: Factor analysis revealed that distress symptoms can be grouped into phobic anxiety, somatisation, depression and hostility. The comparison of the Erzincan and Ankara samples showed that the Erzincan sample had higher phobic anxiety scores, and that females from Erzincan had higher distress as compared to the males from Erzincan and to both males and females from Ankara. Regression analyses showed that being female and evaluating one's home as insecure against future earthquakes were related to elevated levels of distress.

CONCLUSIONS: These results show that, even after 16 months, Erzincan residents had higher phobic anxiety and that females seemed to be especially vulnerable to distress.

Language: English

Keywords: Control group comparison/ Anxiousness/ Psychological distress / Depressed feeling / Risk factors

Mecocci P, Di Iorio AD, Pezzuto S, Rinaldi P, Simonelli G, Maggio D, Montesperelli P, Longo A, Cherubini A, Chiarappa N, Abate G, Senin U. **Impact of the earthquake of September 26, 1997 in Umbria, Italy on the socio-environmental and psychophysical conditions of an elderly population.**

Aging Clinical and Experimental Research, 2000; 12(4): pp.281-286
Earthquake, 1997, Umbria, Italy

OBJECTIVE: To evaluate the socio-environmental and psychophysical conditions of an elderly population after the earthquake in Umbria, Italy. In this event, 14 people died and 100 were injured. The disaster caused extensive damage and was followed by innumerable quakes in the succeeding six months.

METHODS: A randomly selected group of 332 older people (64 years and older) was selected among 1,548 eligible subjects living in the city of Nocera Umbra four months after the event. Three geriatricians evaluated the study subjects by means of a structured interview, and standardised scales: Short Portable Mental Status Questionnaire, Geriatric Depression Scale (GDS), Hamilton Anxiety Scale (HAS), Cumulative Illness Rating Scale (CIRS) and a measure for activities of daily living. Of the study subjects, 11% lived alone, and 33% with the spouse only. Most were self-sufficient in the basic activities of daily life.

RESULTS: Musculoskeletal diseases and hypertension were the most frequently observed pathologies in this geriatric population. In addition, 48% of the subjects lived in temporary houses and more frequently suffered from

hypertension, and had a higher score of comorbidity compared to people who remained at home. People living in the pre-fabricated huts also reported higher scores on the GDS and HAS, and complained more often of their health status, evaluated as self-perception of well-being. Although all the studied subjects suffered from the discomforts caused by the earthquake, the precariousness of living in temporary houses, whose structural characteristics do not take the needs of elderly subjects into account, could justify the higher distress experienced by persons housed in the huts.
CONCLUSIONS: These findings suggest that, after natural disasters, emergency programs should be more adapted to elderly people, whose needs and expectations are often different from those of younger adults.

Language: English

Keywords: Cross-sectional study / Elderly / Psychological distress / Depressed feeling / Anxiousness / Symptoms

Savron G, Bravi F.

Caratteristiche psicologiche in soggetti con disturbo post-traumatico da stress vittime del terremoto del 1997 nella Regione Marche.

(Psychological characteristics in victims of the 1997 earthquake in Marche.)

Rivista di Psichiatria, 2000; 35(6) : pp.276-285

Earthquake, 1997, Umbria, Italy

OBJECTIVE: To examine the prevalence of posttraumatic symptoms and psychological distress one year after the earthquake in Umbria.

METHODS: Sixty male and female adults (mean age 34.77 years) who had been exposed to the earthquake were compared with a non-exposed control group of 60 male and female adults (mean age 34.03 years). Data were obtained at one year after the earthquake using the Brief Psychiatric Rating Scale (BPRS), the Clinician-Administered PTSD Scale for DSM-IV (CAPS), the Anxiety Sensitivity Index (ASI), the Symptom Rating Scale, the Emotional Inhibition Scale (EIS), and the Tridimensional Personality Questionnaire (TPQ).

RESULTS: Twenty-eight percent of the exposed subjects had PTSD, and these subjects with PTSD reported higher scores for anxiety, depression, somatic symptoms, hostility and avoidance than both earthquake exposed subjects without PTSD and control subjects. The earthquake-exposed subjects without PTSD reported more emotional and affective-behavioural inhibition than controls.

CONCLUSIONS: Regardless of the small number of subjects the results of this study suggest the presence of specific psychological traits in people who

develop PTSD, and that the consequences of earthquake exposure are noticeable after one year.

Language: Italian

Keywords: Control group comparison / PTSD / Anxiousness / Depressed feeling / Psychological distress / Risk factors

Wang X, Gao L, Zhang H, Zhao C, Shen Y, Shinfuku N.

Post-earthquake quality of life and psychological well-being: longitudinal evaluation in a rural community sample in northern China.

Psychiatry and Clinical Neurosciences, 2000; 54(4): pp.427-433

Earthquake, 1998, Zhangbei-Shangyi, China

OBJECTIVE: To study the longitudinal change of quality of life (QOL) and psychological well-being in a community sample affected by the Zhangbei earthquake and to examine the relationship between QOL and disaster exposure, post-disaster support and other related variables. This disaster resulted in 49 deaths and more than 10,000 injured, and left 44,000 people homeless during very low temperatures.

METHODS: Subjects were recruited from two villages at different distances from the epicentre. They were assessed using the brief version of the World Health Organization Quality of Life Assessment (WHOQOL-BREF) and three subscales of a symptoms checklist at three months (n = 335) and nine months (n = 253) after the earthquake.

RESULTS: Exposure to the earthquake was associated with multidimensional impairment in QOL, including physical, psychological and environmental domains at three months, and psychological and environmental domains at 9 months. Both victim groups presented significantly more psychological distress in terms of depression, somatisation and anxiety when compared with controls. At both assessment points the group that experienced lower initial exposure but then received less post-disaster help reported poorer QOL and psychological well-being. The two victim groups also differed significantly in changing trend along time. The group that received more support showed a general improvement in post-disaster well-being from three months to nine months.

CONCLUSIONS: These results confirm that post-disaster variables can be as important to post-disaster psychosocial outcomes as pre-disaster and disaster-related variables. The results suggest the importance of comprehensive and prospective assessments of disaster effects in order to improve the organisation of disaster relief programs and psychosocial interventions.

Language: English

Keywords: Longitudinal study / Control group comparison / Depressed feeling / Symptoms / Anxiousness / Quality of life

Cao H, McFarlane AC, Klimidis S.

Prevalence of psychiatric disorder following the 1988 Yun Nan (China) earthquake: the first 5-month period.

Social Psychiatry and Psychiatric Epidemiology, 2003; 38(4): pp.204-212
Yun Nan Earthquake, 1988, Yun Nan, China

OBJECTIVE: To study the psychiatric impact of the Yun Nan earthquake, in which 748 people were killed, 3,664 were injured and nearly 18,000 houses collapsed.

METHODS: Five months after the disaster, 1,294 people were examined with a number of instruments, including the General Health Questionnaire (GHQ-28), the Life Event Inventory, and the Post-traumatic Stress Disorder section of the Diagnostic Interview Schedule (DIS). Three groups were examined according to their distance from the epicentre of the earthquake.

Their responses were compared with an additional sample of 908 people from a general population living 520 kilometres away from the epicentre.

RESULTS: GHQ 'caseness' in the three disaster groups, from those closest to those more distant from the epicentre, were 60%, 48% and 44%. These rates were significantly higher than the non-exposed control group (36%). Among the three disaster groups, taking those who met GHQ 'caseness' criteria, the PTSD prevalence was 23%, 13% and 16%, respectively. For the overall population experiencing the earthquake (the combined disaster group), a conservative estimate of disaster-related PTSD prevalence was 9%.

CONCLUSIONS: The varied rate of morbidity (both general and PTSD-specific) could be attributed to the relative impact of the earthquake as represented by epicentre proximity and as measured by the rate of property damage and loss in the three earthquake-affected areas.

Language: English

Keywords: Control group comparison / PTSD / Psychological distress

Carr VJ, Lewin TJ, Webster RA, Kenardy JA.

A synthesis of the findings from the Quake Impact Study: a two-year investigation of the psychosocial sequelae of the 1989 Newcastle earthquake.

OBJECTIVE: To study the psychosocial sequelae of the Newcastle earthquake, in which 13 people died.

METHODS: A four-phase longitudinal study was carried out; a total of 3,484 subjects participated in at least one phase. A sample of 3,007 was drawn from community electoral rolls and 477 from specially targeted supplementary samples (i.e. the injured, the displaced, the owners of damaged businesses, and the helpers). Psychological morbidity was measured at each phase using the General Health Questionnaire (GHQ-12) and the Impact of Event Scale (IES). Results are presented for six areas of investigation: service utilisation during the first six months post-disaster; patterns of earthquake experience and short-term (six-month) psychosocial outcome; earthquake exposure and medium term (two-year) psychosocial outcome; vulnerability factors and medium-term psychosocial outcome; specific community groups at increased risk (e.g., the elderly and immigrants from non-English-speaking backgrounds); the effects of stress debriefing for helpers.

RESULTS: Twenty percent of the adult population was estimated to have obtained help from general support services; 10% received assistance from disaster-related services. Nearly 9% used both sources of support. While it was estimated that 1.5% were injured, only 0.4% required medical treatment. It was estimated that 15% of the adults were exposed to high levels of threat and disruption. In the first six months, almost 50% of this group would have reached the 0.5 threshold for caseness on the GHQ-12, with 38% reaching the more conservative 0.75 cut-off. Estimates of those experiencing low exposure were 21% and 13%, respectively. The prevalence of PTSD was estimated at 18% among those with high levels of exposure. At two years post-disaster, psychological morbidity had declined, but the influence of initial exposure persisted, especially in relation to posttraumatic stress. No evidence was found for an improved rate of recovery among helpers who were debriefed.

CONCLUSIONS: The overall impact of the earthquake was small, only two percent of the total population was likely to have suffered PTSD in the first six months. Ongoing disruptions, although declining with time, continued throughout the two years of the study. Older people were at greater risk of experiencing posttraumatic stress, in particular older women and elderly persons with avoidant coping styles. There was no evidence that stress debriefing was effective.

Language: English

Keywords: Longitudinal study / Posttraumatic symptoms / Psychological distress / Risk factors / Health services utilisation

Lewin TJ, Carr VJ, Webster RA.

Recovery from post-earthquake psychological morbidity: who suffers and who recovers?

Australian and New Zealand Journal of Psychiatry, 1998; 32(1): pp.15-20
Newcastle Earthquake, 1989, Newcastle, Australia

OBJECTIVE: To identify risk factors for the development of psychiatric morbidity after the Newcastle earthquake.

METHODS: A longitudinal study was carried out in which 515 highly exposed subjects participated. Subjects were allocated to three subgroups (low morbidity; recovered; and persistent morbidity) on the basis of their Impact of Event Scale scores across the four phases of the study. Phases one and two took place in the first 12 months after the earthquake, phases three and four in the subsequent 15 months. Differences between these subgroups were examined on a broad range of variables; e.g. exposure, dispositional characteristics like neuroticism or defence style, coping strategies and demographic variables.

RESULTS: Compared to the low morbidity subgroup, the 'recovered' and 'persistent morbidity' groups were more likely to have used psychopharmaceuticals and to have reported major life events during the six months before the disaster; they had experienced higher threat exposure, reported higher neuroticism and lower hopefulness scores; they used more immature defence styles and avoidant coping strategies and reported a higher level of ongoing life events after the disaster. In addition, those with persistent morbidity were older, more likely to be female, had lower levels of education and were more introverted.

CONCLUSIONS: Post-earthquake morbidity persists longer in those who are older, have a history of emotional problems, have higher neuroticism, use more neurotic defences, and report higher levels of post-disaster life events.

Language: English

Keywords: Longitudinal study / Posttraumatic symptoms / Risk factors

Kolaitis G, Kotsopoulos J, Tsiantis J, Haritaki S, Rigizou F, Zacharaki L, Riga E, Augoustatou A, Bimbou A, Kanari N, Liakopoulou M, Katerelos PP.
Posttraumatic stress reactions among children following the Athens earthquake of September 1999.
European Child & Adolescent Psychiatry, 2003; 12(6): pp.273-280
Earthquake, 1999, Athens, Greece

OBJECTIVE: To assess symptoms of posttraumatic stress disorder, depression and anxiety among children exposed to the Athens earthquake. This disaster resulted in 143 deaths, more than 400 injured and damage to more than 74,000 households.

METHODS: A total of 115 children attending two primary schools located at the epicentre were assessed six months after the earthquake. A group of 48 children not affected by the earthquake was used as a control. The children and their parents completed a number of questionnaires. The children completed the Child Post-Traumatic Stress Disorder-Reaction Index (CPTSD-RI), the Children's Depression Inventory (CDI), and the Screen for Child Anxiety Related Emotional Disorders (SCARED). The parents, mostly mothers, filled in the Impact of Event Scale (IES), the State and Trait Anxiety Inventory (STAI) and the Strengths and Difficulties Questionnaire (SDQ).

RESULTS: Overall, there was a high rate (78%) of severe to mild posttraumatic symptoms in the exposed group. Additionally, a substantial proportion of these children (32%) met the criteria for depression compared to the control group (12%). Severe or moderate symptoms of PTSD were associated with high scores for depression. The relationship between posttraumatic symptoms and anxiety was limited to the "avoidance" factor of the anxiety questionnaire. Those who were most likely to be affected were children alone at the time of the earthquake, and children who sustained injuries.

CONCLUSIONS: These findings indicate that after an earthquake many children have a risk for suffering posttraumatic and depressive symptoms.

Language: English

Keywords: Control group comparison / Children / Posttraumatic symptoms / Depressed feeling / Anxiousness / Risk factors

Maida CA, Gordon NS, Strauss G.

Child and parent reactions to the Los Angeles area Whittier Narrows earthquake.

In: Allen R (ed). Handbook of post-disaster interventions. [Special Issue] *Journal of Social Behavior and Personality*, 1993; 8(5): pp.421-436
Whittier Narrows Earthquake, 1987, Los Angeles, United States

OBJECTIVE: To study the psychological responses of children and their parents who survived the Whittier Narrows area earthquake in Los Angeles. In this event, three people were killed and at least 400 people were evacuated because their houses were damaged or destroyed.

METHODS: Thirty parents and 30 children were interviewed with a questionnaire addressing issues like socio-economic status, physical damage to the home, reactions to the event and parent-child communication patterns. In addition, a behaviour checklist was used in which parents were asked if their child had any of a number of behavioural difficulties. Two-thirds of the sample resided near the epicentre in the Whittier area, where there was major damage. One-third of the sample resided 50 miles away in an area where the tremor was felt but where little damage occurred.

RESULTS: The most frequently reported children's reactions were sleep disturbances, specific fears, nightmares, short attention span and depression. The reactions reported in this study correspond with those defined as posttraumatic stress.

CONCLUSIONS: These results have implications for mental health education programs, disaster preparedness activities and clinical interventions.

Language: English

Keywords: Control group comparison / Children / Parents / Psychological distress / Posttraumatic symptoms / Behaviour problems

2.2 FLOODS

Bokszczanin A.

Long-term negative psychological effects of a flood on adolescents.

Polish Psychological Bulletin, 2002; 33(1): pp.55-61
Floods, 1997, Poland

OBJECTIVE: To study the impact of the 1997 floods in Eastern and Central Europe on the mental health and well-being of children and adolescents.

Poland was one of the countries most affected by this disaster; 55 people drowned and about 162,000 inhabitants had to be evacuated.

METHODS: Twenty months post-disaster, 335 subjects (aged 11-20 years) completed a number of questionnaires concerning their experiences and reactions connected to the event. Measures used were a civilian version of the Mississippi PTSD Scale, the CES – DC for depression in children, the Children’s Loneliness Scale and a few short scales concerning level of life threat during the flood, losses and life satisfaction. The effects were tested using hierarchical multiple regression.

RESULTS: About 60% of the respondents answered to at least one question connected to the threats, 57% suffered losses, and 31% believed they might have died. Girls showed a higher level of PTSD symptoms and more symptoms of depression than boys. The range of threats and losses had a significant influence on the level of PTSD symptoms. With respect to feelings of loneliness, only age was of influence.

CONCLUSIONS: The results show that exposure to the disaster was a strong predictor of symptoms of PTSD, depression and to some extent feeling of loneliness. Those who had experienced greater dangers and losses due to the flood showed more negative effects. The study confirmed expectations that gender, age and place of residence were also important factors influencing the occurrence of psychological problems.

Language: English

Keywords: Cross-sectional study / Children / Adolescents / Quality of life / Posttraumatic symptoms / Depressed feeling / Psychological distress / Risk factors

Ferraro FR.

Psychological resilience in older adults following the 1997 flood.

Clinical Gerontologist, 2003; 26(3-4): pp.139-143

Red River Flood, 1997, Grand Forks, North Dakota, United States

OBJECTIVE: To study the influence of prior earthquake experiences on the impact of the 1997 Red River Flood on older adults. In the Red River Flood, approximately 90% of the residents were forced to leave their homes.

METHODS: Thirty-seven older adults (14 male, 23 female) who had been exposed to the flood were tested at three times following the disaster (1997, 1998, 2000) on measures of self-rated health, amount of medication taken, depression (GDS-SF), and vocabulary ability (WAIS-R).

RESULTS: For self-rated health, depression and vocabulary ability, there were no main or interaction effects. Amount of medication taken resulted in

a gender effect; women were taking more medication than men. There were no effects of time and no gender and times interactions.

CONCLUSIONS: These findings provide some support for the inoculation hypothesis. This hypothesis states that prior experience of natural disasters tends to protect or insulate individuals from strong emotional reaction to future natural disasters.

Language: English

Keywords: Longitudinal study / Elderly / Health status / Depressed feeling / Substance abuse

Green BL, Lindy JD, Grace MC, Gleser GC, Leonard AC, Korol M, Winget C.

Buffalo Creek survivors in the second decade: stability of stress symptoms.

American Journal of Orthopsychiatry, 1990; 60(1): pp.43-54

Buffalo Creek Dam collapse, 1972, West Virginia, United States

OBJECTIVE: To study the long-term psychological impact of the Buffalo Creek dam collapse, which killed 125 people.

METHODS: A sample of 120 survivors was originally assessed in 1974, two years after the disaster, and followed up in 1986, 12 years after the first assessment. The Structural Clinical Interview for DSM-III (SCID) was held and the Psychiatric Evaluation Form (PEF) was used for rating clinical symptoms. In addition, a self-report scale, the SCL-90, was administered.

RESULTS: There were highly significant changes over the 12-year period of study, with symptoms decreasing in all cases. Alcohol abuse was already low in 1974 and did not change much. The proportion of posttraumatic symptoms decreased for both women and men, although the decrease was significant only for the women. The women scored higher than men at the first assessment, two years post-disaster, except on aggressive behaviour and alcohol abuse. After 14 years, the scores for both men and women were nearly identical. Not all survivors were in the normal range of functioning after 14 years; approximately 30% of the sample still showed symptoms of psychopathology and 28% reported posttraumatic symptoms. With regard to posttraumatic stress, 11% of the sample developed this problem after 1974, or else suffered it cyclically and did not meet the criteria in 1974.

CONCLUSIONS: These findings show decreasing symptoms in all areas, although significant psychopathology remained in about one-quarter of the survivors. A small group with delayed onset of symptoms was identified.

Language: English

Keywords: Longitudinal study / PTSD / Anxiety disorder / Depression / Substance abuse / Psychological distress

Green BL, Grace MC, Vary MG, Kramer TL, Gleser GC, Leonard AC.

Children of disaster in the second decade: a 17-year follow-up of Buffalo Creek survivors.

Journal of the American Academy of Child and Adolescent Psychiatry, 1994; 33(1): pp.71-79

Buffalo Creek Dam collapse, 1972, West Virginia, United States

OBJECTIVE: To study the long-term psychological reactions in children who survived the Buffalo Creek dam collapse.

METHODS: Child survivors (aged 2-15 years) were first evaluated in 1974, two years post-disaster, and re-evaluated 17 years post-disaster, when they were adults. Of the original 207 children, 99 were located and re-evaluated using ratings on the Psychiatric Evaluation Form (PEF), the Impact of Event Scale (IES), and the SCL-90 and lifetime and current diagnoses from the Structured Clinical Interview for DSM-III-R (SCID).

RESULTS: Ratings of psychiatric symptoms at the two points in time showed significant decreases in overall severity ratings and in anxiety, aggressive behaviour, somatic concerns, and agitation. A few symptoms increased over time (substance abuse, suicidal ideation). The current rate of disaster-related post-traumatic stress was 7%, down from a post-flood rate of 32%. Women evidenced more PTSD-related symptoms than did men. All current PTSD cases were female. Comparisons with similar subjects from a non-exposed community showed no differences.

CONCLUSIONS: These findings indicate that the children in this study had recovered after 17 years, although they had shown earlier effects after two years.

Language: English

Keywords: Longitudinal study / Children / PTSD / Anxiety disorder / Depression / Substance abuse / Psychological distress

Kunii O, Nakamura S, Abdur R, Wakai S.

The impact on health and risk factors of the diarrhoea epidemics in the 1998 Bangladesh floods.

Public Health, 2002; 116(2): pp.68-74

Floods, 1998, Bangladesh

OBJECTIVE: To examine the impact of the 1998 Bangladesh floods on the health of the communities affected and to explore factors associated with episodes of diarrhoea. These floods resulted in 918 deaths, including 500 deaths due to diarrhoea. In total, 400,000 cases of diarrhoea were identified.

METHODS: About two months after the flood, structured interviews were conducted with 517 people in two districts that had been affected. The questionnaire was composed of items with respect to age, gender, education, economic status, health problems, deaths and sickness in the family, and causes of death and disease.

RESULTS: Of the 517 respondents in the two districts, 98% developed health problems or found that existing health problems were exacerbated. Many perceived that their general health condition was 'much worse' (17%) or 'worse' (64%). The most prevalent condition was fever (64%), followed by respiratory problems (47%), diarrhoea (44%), and skin problems (41%). Only 1% and 7% of the respondents treated water before drinking, although water collected from tube-wells (93%) and rivers (6%) was perceived by 75% of the respondents to be contaminated. In logistic regression analysis, male sex, poor economic status, lack of distribution of water purification tablets, and the type of water storage vessels had a significant association with diarrhoea.

CONCLUSIONS: The 1998 Bangladesh flood had a substantial impact on the health of communities. Diarrhoea was associated with socio-economic status, water handling and household sanitation. There ought to be more emphasis on health education in the pre-disaster period in order to empower communities against floods.

Language: English

Keywords: Cross-sectional study/ Fever / Respiratory symptoms/ Diarrhoea / Skin diseases

Phifer JF.

Psychological distress and somatic symptoms after natural disaster: differential vulnerability among older adults.

Psychology and Aging, 1990; 5(3): pp.412-420

Floods, 1984, Kentucky, United States

OBJECTIVE: To examine risk factors for psychological and physical symptoms in older people who were exposed to the Kentucky floods. More than 5,000 persons had to be evacuated, more than 6,000 homes were damaged and over 500 families were left homeless.

METHODS: A sample of more than 200 older adults was interviewed a few years before and 18 months after the disaster. Measures, among others, were: State-Trait Anxiety Inventory (STAI-T), Center for Epidemiologic Studies Depression Scale (CES-D), General Well-Being Scale.

RESULTS: Flood exposure was related to increases in depressive, anxiety, and somatic symptoms at 18 months post-flood. Within this older adult sample, men and those with lower occupational status were significantly more at risk for increases in psychological symptoms. Socio-demographic status did not moderate the impact of flood exposure on physical health.

CONCLUSIONS: These findings confirm those of other studies that have shown adverse physical and psychological sequelae in older adults after exposure to a natural disaster.

Language: English

Keywords: Pre-post comparison / Elderly / Quality of life / Depressed feeling / Anxiousness / Psychological distress / Symptoms / Risk factors

Escobar JI, Canino G, Rubio-Stipec M, Bravo M.

Somatic symptoms after a natural disaster: a prospective study.

American Journal of Psychiatry, 1992; 149(7): pp. 965-967

Floods and mudslides, 1985, Puerto Rico

OBJECTIVE: To examine the prevalence of somatisation symptoms among adults after the Puerto Rican floods, in which 180 people died and thousands were injured.

METHODS: In 1984, about one year before the disaster, 1,551 subjects were interviewed with a Spanish version of the Diagnostic Interview Schedule (DIS). In 1987, over one year after the event, 912 subjects were interviewed again. Of these, 41% (n = 375) were part of the original cohort; 139 were classified as having been exposed, the remaining 236 as unexposed.

RESULTS: Overall, a higher proportion of exposed compared to unexposed subjects reported new or persistent symptoms. However, the only statistically significant differences were for new gastrointestinal and pseudo-neurological symptoms.

CONCLUSIONS: Exposure to the disaster was related to a higher prevalence of medically unexplained physical symptoms, particularly gastrointestinal ones (abdominal pain, vomiting, nausea, excessive gas) and pseudo-neurological ones (amnesia, paralysis, fainting, unusual spells/double vision).

Language: English

Keywords: Pre-post comparison / MUPS / Symptoms

Bravo M, Rubio-Stipec M, Canino GJ, Woodbury MA, Ribera JC.
The psychological sequelae of disaster stress prospectively and retrospectively evaluated.

American Journal of Community Psychology, 1990; 18(5): pp.661-680
Floods and mudslides, 1985, Puerto Rico

OBJECTIVE: To study the psychological sequelae of the Puerto Rican floods among adult victims.

METHODS: A sample of 912 persons was surveyed about one year after the disaster, including 375 persons who had been interviewed about one year before the event with a Spanish version of the Diagnostic Interview Schedule (DIS). A rigorous methodology, which included both retrospective and prospective designs, was used, enabled by the occurrence of a catastrophic disaster only a year after a comprehensive survey was completed.

RESULTS: Retrospective analyses of the total sample indicate that the unexposed had lower levels of somatic symptoms than the moderately exposed, and lower levels of alcohol use or posttraumatic symptoms than the severely exposed. The exposed reported a higher level of lifetime symptoms one year after the disaster and two years after the first survey. Results of multiple regression analyses show that the higher the degree of exposure the higher the level of depressive, somatic and posttraumatic symptoms. The prospective data tend to confirm these results for depressive and somatic symptoms.

CONCLUSIONS: Framed in a stress theoretical perspective, disaster effects for new depressive, somatic, and posttraumatic stress symptoms were identified, even after adjusting for demographic and methodological factors. All the effects, however, were relatively small, suggesting that most disaster victims were rather resilient to the development of new psychological symptoms. A comparison of results with previous findings and the implications for both disaster and stress research are discussed, as well as the role of community psychologists in disaster action.

Language: English

Keywords: Pre-post comparison / Posttraumatic symptoms / Depressed feeling / Substance abuse / MUPS / Symptoms

Verger P, Hunault C, Rotily M, Baruffol E.

Facteurs de variation des symptômes de stress post-traumatique cinq années après l'inondation de 1992 dans le Vaucluse.

(Risk factors for post traumatic stress symptoms five years after the 1992 flood in the Vaucluse (France).)

Revue d'Epidémiologie et de Santé Publique, 2000; 48(Suppl 2): pp.2S44-2S53

Floods, 1992, Vaucluse, France

OBJECTIVE: To assess the prevalence of posttraumatic symptoms and its risk factors after the 1992 floods in the Vaucluse, which caused 38 deaths.

METHODS: Five years after the disaster, a telephone survey was carried out in Bédarrides, one of the most affected municipalities. Five hundred adult residents of Bédarrides were interviewed. Symptoms of PTSD were assessed using a structured questionnaire based on DSM-IV criteria (the QE-PTSD) and a PTSD score was calculated. Individual exposure was retrospectively assessed by questionnaire. To take into account the exposure level, an indicator of cumulated exposure was established. Multiple regression analyses were performed to explain the PTSD score.

RESULTS: A significantly higher PTSD score was observed for females, subjects older than 35 years, subjects with a monthly income lower than 1,350 euro, subjects with a history of psychological disorders or previous life-threatening traumatic event. A significant exposure-effect relationship was observed between the level of exposure to the flood and the PTSD score which was multiplied by 3.4 in the most severely exposed individuals. An increased PTSD score was also observed in subjects residing in the flooded area and in those who benefited from psychological care at the time of the flood.

CONCLUSIONS: These results indicate a long-term psychological impact of the 1992 flood on the Bédarrides population.

Language: French

Keywords: Cross-sectional study / Posttraumatic symptoms / Risk factors

2.3 TORNADOES AND HURRICANES

Hardin SB, Weinrich M, Weinrich S, Hardin TL, Garrison C.
Psychological distress of adolescents exposed to Hurricane Hugo.
Journal of Traumatic Stress, 1994; 7(3): pp.427-440
Hurricane Hugo, 1989, South Carolina, United States

OBJECTIVE: To study psychological stress and related variables in adolescents living in the area of Hurricane Hugo. In this event, 27 people were killed.

METHODS: One year after the disaster, 1,482 high school students completed the Carolina Adolescent Health Project Survey (CAHPS), a self-administered questionnaire measuring Hugo exposure, non-violent and violent life events, social support, self-efficacy, and psychological distress.

RESULTS: Seventy-six percent of the subjects reported some exposure to the disaster. However, of this group, 89% were only minimally exposed. As exposure increased, adolescents reported increased symptoms of psychological distress, i.e., anger, depression, anxiety, and general mental distress. Females and white students experienced higher levels of distress. In most cases, other stressful life events were at least as strong a predictor of psychological distress as was exposure to the hurricane. Self-efficacy and social support were protective.

CONCLUSIONS: Only a small proportion of the study sample was substantially exposed. However, the results of this study indicate that exposure leads to symptoms of psychological distress.

Language: English

Keywords: Cross-sectional study / Adolescents / Psychological distress / Depressed feeling / Anxiousness / Risk factors

Lonigan CJ, Shannon MP, Taylor CM, Finch AJ Jr, Sallee FR.
Children exposed to disaster: II. Risk factors for the development of post-traumatic symptomatology.
Journal of the American Academy of Child and Adolescent Psychiatry, 1994; 33(1): pp.94-105
Hurricane Hugo, 1989, South Carolina, United States

OBJECTIVE: To identify risk factors for posttraumatic stress symptoms in children exposed to Hurricane Hugo.

METHODS: Three months after the disaster, 5,687 school-age children were surveyed about their experiences and reactions to the hurricane. Self-reports of PTSD symptoms were obtained by use of a PTSD Reaction Index.

RESULTS: The presence of PTSD symptoms was strongly related to children's reported severity of the hurricane, degree of home damage sustained, and continued displacement; however, children's level of trait anxiety and their reported emotional reactivity during the hurricane were more strongly related to the presence of PTSD symptoms than were the exposure factors. Different sets of risk factors appeared to differentially influence the development of the three DSM-III-R PTSD symptom clusters. Little evidence of a differential effect of the risk factors between females and males and younger and older children was found.

CONCLUSIONS: Level of trait anxiety appears to be the strongest risk factor for the development of severe posttraumatic reactions. The higher rate of posttraumatic symptoms in females and younger children in combination with the absence of differential reaction to the risk factors suggests that females and younger children are more likely to develop posttraumatic reactions following a disaster.

Language: English

Keywords: Cross-sectional study / Children / Posttraumatic symptoms / Risk factors

Thompson MP, Norris FH, Hanacek B.

Age differences in the psychological consequences of Hurricane Hugo.

Psychology and Aging, 1993; 8(4): pp.606-616

Hurricane Hugo, 1989, South Carolina, United States

OBJECTIVE: To examine whether age is a risk factor for psychological distress in adults who survived Hurricane Hugo. A second aim was to evaluate four different perspectives on disaster recovery that have been previously used to explain age differences: the exposure perspective (older adults experience more adverse consequences), resource perspective (coping capacity decreases with age), inoculation perspective (coping capacity increases with age, due to earlier stress experiences) and the burden perspective (middle-aged people are most affected, due to disruption to their provider role).

METHODS: At 12, 18, and 24 months after the disaster, 831 adults were interviewed regarding their disaster-related stressors and present psychological state. The Brief Symptom Inventory (BSI), the Perceived Stress Scale and a five-item measure of traumatic stress were used. In the

interviews, four aspects of disaster impact were examined and coded: injury, life threat, financial loss and personal loss. The sample was divided into four age groups: 18-34 (young), 35-49 (early middle-aged), 50-64 (late middle-aged) and 65 and older (older adults).

RESULTS: Injury, life threat, financial and personal loss all had significant effects on overall symptoms, depression, anxiety, somatic complaints, general stress and traumatic stress. Adverse disaster effects were absent in the youngest group, mild to moderate in the early middle-aged group, strong in the late middle-aged group and modest in the oldest group.

CONCLUSIONS: These findings indicate that disaster exposure had substantial and pervasive psychological effects. The analyses also revealed a curvilinear interaction between disaster exposure and age. Younger people exhibited the most distress in the absence of disaster, but middle-aged people did so in its presence. Differential exposure, resources, and inoculation all failed to explain these differences, however, the burden perspective had considerable explanatory power.

Language: English

Keywords: Longitudinal study / Psychological distress / Depressed feeling / Anxiousness / Physical symptoms / Risk factors

Khoury EL, Warheit GJ, Hargrove MC, Zimmerman RS, Vega WA, Gil AG.
The impact of Hurricane Andrew on deviant behavior among a multi-racial/ethnic sample of adolescents in Dade County, Florida: a longitudinal analysis.

Journal of Traumatic Stress, 1997; 10(1): pp.71-91

Hurricane Andrew, 1992, Florida, United States

OBJECTIVE: To examine the relationships between posttraumatic stress and minor deviant behaviour in adolescents exposed to Hurricane Andrew. In this event, 55 people died.

METHODS: The sample consisted of 4,978 Hispanic, African-American, and White non-Hispanic students. Two waves of data were collected prior to the hurricane; a third was obtained approximately six months following the storm. Questionnaires were used with respect to exposure, stress symptoms, family coping resources and minor deviance. Analyses were made for gender, ethnic group and socio-economic status.

RESULTS: A significant relationship was found between exposure and posttraumatic symptoms for both boys and girls. Girls were significantly more likely to report posttraumatic symptoms. Family support was negatively correlated with behaviour problems for both boys and girls. There

was no significant effect of family support on posttraumatic symptoms for boys, but there was a significant negative effect for girls. Racial and ethnic group variables and socio-economic status were not significantly related to behaviour problems for boys but they were for girls. There was only a weak relationship between exposure and behaviour problems. The relationship between posttraumatic symptoms and behaviour problems was weak for boys and moderate for girls.

CONCLUSIONS: These results indicate that girls are more likely to report higher levels of posttraumatic symptoms than boys. After controlling for pre-hurricane levels of minor deviance, family support, and race/ethnicity, hurricane stress symptom levels remained a significant predictor of post-hurricane minor deviant behaviour.

Language: English

Keywords: Pre-post comparison / Adolescents / Behaviour problems / Posttraumatic symptoms / Risk factors

La Greca A, Silverman WK, Vernberg EM, Prinstein MJ.

Symptoms of posttraumatic stress in children after Hurricane Andrew: a prospective study.

Journal of Consulting and Clinical Psychology, 1996; 64(4): pp.712-723
Hurricane Andrew, 1992, Florida, United States

OBJECTIVE: To study posttraumatic symptoms in children who have been exposed to Hurricane Andrew.

METHODS: Participants were 442 elementary school children. They were evaluated at three, seven, and 10 months post-disaster with respect to five factors from a conceptual model of the effects of traumatic events: (a) their exposure to traumatic events during and after the disaster, (b) their pre-existing demographic characteristics, (c) the occurrence of major life stressors, (d) the availability of social support, and (e) the type of coping strategies used to cope with disaster-related distress. Measures used were the Posttraumatic Stress Disorder Reaction Index for Children (RI), Hurricane-Related Traumatic Experiences (HURTE), Social Support Scale for Children (SSSC), the Kidcope coping questionnaire and the Life Event Schedule (LES).

RESULTS: Children's reporting of posttraumatic symptoms declined over time. However, a proportion of children continued to report high levels of symptoms at seven and 10 months post-disaster. About 30% reported severe levels of posttraumatic stress at time one, 18% at time two and 12% at time three. To evaluate the stability of symptoms, correlations were computed for

RI Total Scores between the three time points. These correlations were high. Exposure variables reflecting life threat accounted for about 15% of the variance in RI scores at seven months and 9% at ten months post-disaster. Exposure variables reflecting loss and disruptions accounted for five percent and three percent respectively. Child demographic characteristics, such as age, grade and ethnicity, accounted for 3.6% of the variance and major life events that occurred during the recovery period accounted for about four percent. Social support variables accounted for about 9%, coping variables for about 10% of the remaining variance.

CONCLUSIONS: These results indicate that, although posttraumatic symptoms declined over time, a substantial level of symptomatology was observed up to 10 months after the disaster. All five factors in the conceptual model were predictive of children's posttraumatic symptoms seven and 10 months post-disaster.

Language: English

Keywords: Longitudinal study / Children / Posttraumatic symptoms / Risk factors / Coping

Norris FH, Perilla JL, Riad JK, Kaniasty K, Lavizzo EA.

Stability and change in stress, resources, and psychological distress following natural disaster: findings from Hurricane Andrew.

Anxiety, Stress, and Coping, 1999; 12(4): pp.363-396

Hurricane Andrew, 1992, Florida, United States

OBJECTIVE: To examine the longitudinal course of the psychological consequences of Hurricane Andrew.

METHODS: Two hundred and forty-one subjects participated in this study. They were assessed twice: six and 30 months following the hurricane. They were interviewed and the following measures were used: Traumatic Stress Schedule, The Center for Epidemiological Studies Depression Scale (CES-D), the Revised Civilian Mississippi Scale (RCMS) and three measures of personal and social resources.

RESULTS: Percentages meeting criteria for depression and PTSD did not change over time. Mean levels of intrusion and arousal decreased, depressive symptoms remained stable, and avoidance/numbing symptoms increased. Intrusion and arousal were associated more strongly with gender, ethnicity, and disaster factors of injury and property loss than with the post-disaster factors of stress and resources. However, the reverse was true for depression and avoidance. Changes over time in symptoms were largely explained by changes over time in stress and resources.

CONCLUSIONS: These findings indicate that symptoms of posttraumatic stress and depression remain rather stable over time and that ongoing mental health services are needed.

Language: English

Keywords: Longitudinal study/ Posttraumatic symptoms/ Depressed feeling / Risk factors

Riad JK, Norris FH.

The influence of relocation on the environmental, social, and psychological stress experienced by disaster victims.

Environment and Behavior, 1996; 28(2): pp.163-182

Hurricane Andrew, 1992, Florida, United States

OBJECTIVE: To study the effects of relocation on environmental, social and psychological stress in victims of Hurricane Andrew.

METHODS: The subjects were 404 residents of the area which was hit by the disaster. They were interviewed in their current residences six months after the hurricane. Ecological and social stressors were rated on a four-point or five-point scale. Psychological stress was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D).

RESULTS: Regarding ecological stress, significant effects were found for insects and crowding. Those who did not relocate experienced a greater increase in insect problems than those who did relocate. Those who were relocated experienced more of an increase in crowding than those who did not relocate. With respect to social stress, significant effects were found for isolation and fear of crime. Relocated persons were more isolated, whereas those who did not relocate had a higher fear of crime. Relocated persons were more likely to have stopped participating in social activities and to have a friend or family member living farther away. With respect to psychological distress, no significant differences were found between relocated and non-relocated subjects. However, distress scores were influenced by environmental and social stressors.

CONCLUSIONS: These results indicate that at six months after the event, relocation was associated with higher levels of ecological stress, crowding, isolation, and social disruption. Moreover, relocation and ecological stress interacted to predict psychological symptoms. Relocated persons living in poor conditions fared worse than either non-relocated persons who lived under comparable conditions or other relocated persons who lived in better conditions.

Language: English

Keywords: Cross-sectional study/ Psychological distress/ Depressed feeling / Risk factors

Caldera T, Palma L, Penayo U, Kullgren G.

Psychological impact of the hurricane Mitch in Nicaragua in a one-year perspective.

Social Psychiatry and Psychiatric Epidemiology, 2001; 36(3): pp.108-114

Hurricane Mitch, 1998, León, Nicaragua

OBJECTIVE: To assess the prevalence of posttraumatic stress disorder (PTSD) and posttraumatic symptoms among people afflicted by hurricane Mitch in Nicaragua. Furthermore, risk factors for PTSD symptoms were identified. This hurricane killed more than 2,000 persons.

METHOD: At four primary health care centres, 496 adult patients were interviewed six months after hurricane Mitch with regard to PTSD symptoms, disaster experiences and post-disaster help-seeking. The Harvard Trauma Questionnaire (HTQ) was used and those patients who were identified as PTSD cases (n = 29) were contacted six months later; they were re-interviewed and diagnosed according to DSM-IV through a clinical interview.

RESULTS: All individuals resident in the area during Mitch were judged to have experienced a trauma. Regarding more specific traumas, 39% reported a close relative to be dead or seriously injured and 72% had their house partly or completely destroyed. Prevalence of PTSD ranged from 9% in the worst afflicted area to 4.5% in a less damaged area. From a dimensional perspective, PTSD symptoms according to HTQ six months after the disaster were significantly associated with the death of a relative, a house destroyed, female sex, previous mental health problems and illiteracy. Those with previous mental health problems (OR = 4.84) were more likely than others to seek help from any source whereas the opposite was true for illiterate people (OR = 0.38). Of all respondents, 8.5% reported that they had thought of taking their lives, and illiterates (OR 2.84) and those with previous mental health problems (OR 2.84) were at particular risk for suicidal problems. One year after Mitch, half of those identified as PTSD cases at six months still fulfilled the criteria for a PTSD diagnosis.

CONCLUSIONS: PTSD represents a serious mental health problem after a disaster. Those with illiteracy, females and those with previous mental health problems should be targets for early post-disaster intervention.

Language: English

Keywords: Cross-sectional study / PTSD / Posttraumatic symptoms / Risk factors

Campanella N.

Infectious diseases and natural disasters: the effects of Hurricane Mitch over Villanueva municipal area, Nicaragua.

Public Health Reviews, 1999; 27(4): 311-319

Hurricane Mitch, 1998, León, Nicaragua

OBJECTIVE: To study the incidence of infectious diseases after Hurricane Mitch.

METHODS: Incidences of acute diarrhoeas (AD), respiratory tract infectious diseases (ARD), and malaria were estimated throughout a thirty-day post-hurricane period and compared with the previous off-crisis data. New cases of leptospirosis were searched, but no control group was available.

RESULTS: The incidence of AD and ARD increased significantly in comparison with pre-disaster data (6,798 versus 2,849 per 100,000 inhabitants ($p < 0.01$) and 1,205 vs. 295 per 100,000 inhabitants ($p < 0.01$)). The increase in incidence of malaria was not explicit. Only three cases of leptospirosis were ascertained.

CONCLUSIONS: These results indicate a clear increase in diarrhoea and respiratory tract infections during the first month post-disaster

Language: English

Keywords: Pre-post comparison / Diarrhoea / Respiratory tract infections / Malaria

Goenjian AK, Molina L, Steinberg AM, Fairbanks LA, Alvarez ML, Goenjian HA, Pynoos RS.

Posttraumatic stress and depressive reactions among Nicaraguan adolescents after hurricane Mitch.

American Journal of Psychiatry, 2001; 158(5): pp.788-794

Hurricane Mitch, 1998, León, Nicaragua

OBJECTIVE: To study posttraumatic stress and depressive reactions among adolescents exposed to Hurricane Mitch and the relationship of these reactions to exposure, death of a family member, forced relocation, and thoughts of revenge.

METHODS: Six months after the hurricane, 158 adolescents (mean age: 13 years) from three differentially exposed cities were evaluated by using a hurricane exposure questionnaire, the Child Posttraumatic Stress Disorder Reaction Index, and the Depression Self-Rating Scale.

RESULTS: High levels of posttraumatic stress and depressive reactions were found among adolescents in the two most heavily affected cities. Severity of posttraumatic stress and depressive reactions and features of objective hurricane-related experiences followed a "dose-of-exposure" pattern that was congruent with the rates of death and destruction across cities. With respect to the subjective exposure scale, most reactions did not follow a 'dose-of-exposure' pattern. There was no effect found from forced relocation for predicting the severity of posttraumatic stress reactions.

CONCLUSIONS: These findings indicate that adolescents from heavily affected areas experience severe and chronic posttraumatic stress and comorbid depressive reactions, after a category five hurricane. There is a strong need for public mental health approaches, including systematic screening and trauma/grief-focused interventions, within a comprehensive disaster recovery program.

Language: English

Keywords: Cross-sectional study / Adolescents / Posttraumatic symptoms / Depressed feeling / Risk factors

Benight CC, Swift E, Sanger J, Smith A, Zeppelin D.

Coping self-efficacy as a mediator of distress following a natural disaster.

Journal of Applied Social Psychology, 1999; 29(12): pp.2443-2464
Hurricane Opal, 1995, Florida, United States

OBJECTIVE: To study individual differences in psychological reactions following Hurricane Opal, a natural disaster in which 59 people died. Social-cognitive theory and conservation-of-resources theory were used to explain these individual differences.

METHODS: These theories were operationalised in coping self-efficacy, lost resources, social support, and optimism. These variables were assessed along with demographic variables in predicting distress. Participants were 67 residents (aged 23-77 years) of the afflicted area, who were assessed about five months after the disaster. The following measures were used: Loss Of Resources scale (LOR), Interpersonal Support Evaluation List (ISEL), a hurricane coping self-efficacy measure, Life Orientation Test (LOT), SCL-90 and Impact of Event Scale (IES).

RESULTS: Multiple regression analyses showed that coping self-efficacy was the strongest predictor of general distress and trauma-related distress. Loss of resources and gender were also important predictors of general distress. Path analyses showed that lost resources directly influenced general distress, social support, optimism, and coping self-efficacy. These analyses also indicated that coping self-efficacy perceptions mediated the following relationships: between loss of resources and trauma-related distress, between social support and both trauma and general distress, and between optimism and both types of distress.

CONCLUSIONS: These findings demonstrate the influence of resource loss on psychological outcome and its impact on remaining internal resources (like coping self-efficacy and optimism) and external resources (like lost resources and social support). The results further suggest that coping self-efficacy serves as a mediator between the predictor variables and psychological distress.

Language: English

Keywords: Cross-sectional study / Psychological distress / Posttraumatic symptoms / Risk factors / Coping / Social support

Simeon DT, Grantham-McGregor SM, Walker SP, Powell CA.

Effects of a hurricane on growth and morbidity in children from low-income families in Kingston, Jamaica.

Transactions of the Royal Society of Tropical Medicine and Hygiene, 1993; 87(5): p.526-528

Hurricane Gilbert, 1988, Kingston, Jamaica

OBJECTIVE: To study physical growth, morbidity and nutritional status in children from poor areas in Jamaica who survived Hurricane Gilbert. In this event, 45 people died.

METHODS: When the hurricane struck Jamaica, a longitudinal study was in progress in which children's weights and heights were recorded every two months and their morbidity histories taken every week. The children were visited weekly by community health aids who registered symptoms using structured questionnaires. Weight and height were measured using standard anthropometric techniques. The investigation included 127 stunted (low height-for-age) and 32 non-stunted children aged 23-44 months, living in poor areas. The data from the four months before and after the hurricane were compared.

RESULTS: There was an increase in the occurrence of respiratory symptoms including rapid or difficult breathing ($P < 0.04$), coughs ($P < 0.001$) and

nasal discharges ($P < 0.001$) during the first two-month period after the hurricane. There was no significant effect on the occurrence of diarrhoea and injuries. Deficits were also found in height gain ($P < 0.001$) during the same period.

CONCLUSIONS: These results indicate adverse effects in the first two-month period after the hurricane, which were found in spite of the large amount of food aid received and the aggressive health education programme implemented after the event.

Language: English

Keywords: Pre-post comparison / Longitudinal study / Children / Respiratory symptoms / Diarrhoea

Middleton KL, Willner J, Simmons KM.

Natural disasters and posttraumatic stress disorder symptom complex: evidence from the Oklahoma tornado outbreak.

International Journal of Stress Management, 2002; 9(3): pp.229-236

Tornado, 1999, Oklahoma City, United States

OBJECTIVE: To study the risk factors of posttraumatic symptoms after a severe storm, the tornado which struck Oklahoma, killing 41 people.

METHODS: One year after the disaster, 109 adults, whose houses were damaged by the tornado, participated. They took part in a standardised telephone interview containing a series of trauma questions and a DSM-IV PTSD checklist. Individual variables of interest were age, gender, income and education; situational variables were intensity of the traumatic event, proximity to the storm, physical damage to the home, and loss of personal possessions; and the two moderating variables were perceived instrumental and social support. Posttraumatic symptoms like intrusion, avoidance, and arousal were assessed.

RESULTS: The results of hierarchical regression analyses indicate that significant predictors of posttraumatic symptoms included marital status, household size, personal injury, and loss of personal possessions. Situational factors explained the largest amount of variance in avoidance and arousal, and individual factors explained significant variance in the presentation of posttraumatic symptoms including intrusion, avoidance and arousal.

CONCLUSIONS: These findings indicate that individuals may suffer from posttraumatic symptoms even a full year after the occurrence of a traumatic event. The results are mixed with regard to the investigated risk factors.

While marriage may reduce stress due to the support it provides, it also may

increase stress through increased responsibility. Emotion-focused coping behaviours may be more important than problem-based coping strategies.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Risk factors / Coping

Siegel JM, Shoaf KI, Afifi AA, Bourque LB.

Surviving two disasters: does reaction to the first predict response to the second?

Environment and Behavior, 2003; 35(5): pp.637-654

El Niño, 1997-1998, Los Angeles County, United States

Northridge Earthquake, 1994, Los Angeles, United States

OBJECTIVE: To study the influence of a prior experience with a disaster (the 1994 Northridge earthquake) on the ability to prepare for and to deal with a second disaster, the El Niño weather pattern. El Niño was an anticipated slow-onset disaster; concrete recommendations were made regarding preparedness activities. This study addressed whether emotional injuries experienced in one disaster predispose individuals to emotional injury in a subsequent disaster, and whether other disaster-related parameters (physical injury and property damage) are similarly associated across two disasters.

METHODS: Subjects (n = 414) who were studied after the Northridge California earthquake in 1994 were recontacted four years later. Telephone interviews were conducted in the spring of 1999. The Brief Symptom Inventory (BSI) was used and questions were asked about demographic variables, property and personal damage, physical and emotional injuries and preparedness for El Niño.

RESULTS: Emotional injury both facilitated preparedness, in terms of the number of hazard-mitigation activities performed, and predisposed to a subsequent emotional injury. An unexpected finding emerged showing that emotional injury increased the chance of reporting damage in a second disaster, a relationship that was maintained after controlling for emotional injury in the second disaster.

CONCLUSIONS: The impact of self-reported emotional injury in two sequential disasters underscores the need for a comprehensive assessment of disaster reactions in post-disaster research and across disasters.

Language: English

Keywords: Longitudinal study / Psychological distress / Disaster preparedness

Eustace K, MacDonald C, Long N.

Cyclone Bola: a study of the psychological after-effects.

Anxiety, Stress and Coping, 1999; 12(3): pp.285-298

Cyclone Bola, 1988, East Coast of North Island, New Zealand

OBJECTIVE: To study the long-term psychological effects of Cyclone Bola, in which more than 3,000 people were evacuated.

METHODS: Five years after the disaster, data were collected from 118 adults who had been evacuated from their homes during the cyclone and/or who applied for financial aid following the disaster. The following self-report questionnaires were used: Civilian Mississippi Scale, Hopkins Symptom Checklist (HSCL-21), Impact of Events Scale (IES), Norris Traumatic Stress Schedule (TSS), Social Support Questionnaire (SSQ) and a newly developed Traumatic Exposure Scale.

RESULTS: Twelve percent of the respondents could be classified as posttraumatic stress disorder (PTSD) cases and 17% were classified with high psychological distress scores. High PTSD and psychological distress scores were significantly related to higher mean levels of emotional distress at the time of the disaster and to greater dissatisfaction with both post-disaster assistance and social support.

CONCLUSIONS: These results indicate that a significant proportion of persons exposed to a natural disaster are at risk for developing long-term psychological problems.

Language: English

Keywords: Cross-sectional study / PTSD / Posttraumatic symptoms / Risk factors

2.4 VOLCANIC ERUPTIONS

Ohta Y, Araki K, Kawasaki N, Nakane Y, Honda S, Mine M.

Psychological distress among evacuees of a volcanic eruption in Japan: A follow-up study.

Psychiatry and Clinical Neurosciences, 2003; 57(1): pp.105-111

Volcanic eruption, 1991, Mount Unzen, Japan

OBJECTIVE: To evaluate the extent of psychological distress in people who had been evacuated after the Mount Unzen eruption. The eruption started in November 1990. In June 1991 a large flow occurred in which 43 people died. By then the displacement of evacuees started. The flow of lava continued to cause damage until June 1996. One quarter of the local population (50,000 inhabitants) was forced to live as evacuees.

METHODS: Two hundred and forty-eight evacuees were evaluated at four time points after evacuation: six months, 12 months, 24 months and 44 months. The 30-item General Health Questionnaire (GHQ-30) was used.

RESULTS: The proportion of evacuees with psychological distress (defined as a GHQ score ≥ 8) significantly decreased from 66% (six months) to 45% (44 months). The GHQ mean score significantly improved from 12.6 to 8.9. Investigation of each factor on the GHQ showed progressive improvement over time in 'anxiety, tension and insomnia' and 'lack of energy and social dysfunction'. However, 'depression' began to improve only after 44 months and 'interpersonal dysfunction' started to worsen after 12 months. Recovery from psychological distress was more difficult in middle-aged and older evacuees than in younger evacuees.

CONCLUSIONS: These findings show a significant improvement, almost four years post-disaster, but still a rather high amount of psychological distress.

Language: English

Keywords: Longitudinal study / Psychological distress / Depressed feeling

Lima BR, Pai S, Santacruz H, Lozano J.

Psychiatric disorders among poor victims following a major disaster: Armero, Colombia.

The Journal of Nervous and Mental Disease, 1991; 179(7): pp.420-427
Volcanic eruption, 1985, Armero, Colombia

OBJECTIVE: To study the level of psychiatric morbidity in poor adult victims living in tent camps following the Armero volcanic eruption. In this event, 24,000 people died as a result of mudslides.

METHODS: Eight months following the disaster, 102 subjects were evaluated, using the Self-Reporting Questionnaire (SRQ). A subsample was interviewed by a psychiatrist.

RESULTS: Ninety-one percent of the subjects identified by the screening instrument as being emotionally distressed met DSM-III criteria for a psychiatric disorder. The most frequent diagnoses were posttraumatic stress disorder and major depression.

CONCLUSIONS: These findings show that these victims are not merely distressed; rather, they present clear and treatable psychiatric disorders that centre on anxiety and depression. Interventions for their adequate management need to be designed, implemented, and evaluated. In a developing country, however, the high prevalence of mental disorders among disaster victims far exceeds the specialised mental health resources. The general health sector, particularly the primary level of care, must participate actively in the delivery of mental health services to meet these needs, particularly for a socio-economically disadvantaged population.

Language: English

Keywords: Cross-sectional study / PTSD / Depression / Anxiety disorder

Lima BR, Pai S, Toledo V, Caris L, Haro JM, Lozano J, Santacruz H.

Emotional distress in disaster victims. A follow-up study.

Journal of Nervous and Mental Disease, 1993; 181(6): pp.388-393

Volcanic eruption, 1985, Armero, Colombia

OBJECTIVE: To conduct a follow-up study in adult victims of the Armero volcanic eruption.

METHODS: One hundred thirteen adult victims were screened for emotional distress one and five years after the disaster (in 1986 and 1990, respectively), using the Self-Reporting Questionnaire (SRQ).

RESULTS: The prevalence of emotional distress decreased from 65% in 1986 to 31% in 1990. However, a comparison of the symptomatology on these two assessments indicates a similarity in the frequency and profiles of symptoms among the distressed. Also, the most frequent symptoms and the strongest predictors of emotional distress were essentially the same.

CONCLUSIONS: These findings provide empirical support to the clinically observed course of emotional symptomatology in disaster victims.

Language: English

Keywords: Longitudinal study / Psychological distress

Forbes L, Jarvis D, Potts J, Baxter PJ.

Volcanic ash and respiratory symptoms in children on the island of Montserrat, British West Indies.

Occupational and Environmental Medicine, 2003; 60(3): p.207-211

Volcanic eruption, 1995, Montserrat, British West Indies

OBJECTIVE: To study the long-term effect of ashfalls after the volcanic eruption on Montserrat on childrens' respiratory health. This eruption resulted in ashfall deposits and the ash infiltrated homes and public buildings.

METHODS: A survey of asthma diagnoses, respiratory symptoms, exercise induced bronchoconstriction (EIB), and current and previous exposure to volcanic ash was carried out in schools in Montserrat about two-and-a-half year after the disaster. Carers (mostly parents) were asked to complete a questionnaire based on the International Study of Asthma and Allergies in Children (ISAAC). Next the children were asked to perform exercise testing. Peak expiratory flow rate (PEFR) was measured.

RESULTS: Information was available for nearly 80% of the 443 children on the school rolls. The prevalence of wheeze symptoms in the previous 12 months was 18% in children aged 12 years and under and 16% in children aged 13 years and over. In children aged 12 and under, the prevalence of wheeze was greater in those who had ever been heavily or moderately exposed to volcanic ash compared with the group who had only ever been exposed to low levels (wheeze in last 12 months: odds ratio (OR) 4.30; wheeze ever: OR 3.45). The prevalence of EIB in 8-12 year olds was about four times higher in those who were currently heavily exposed to volcanic ash (OR 3.85) compared to those currently exposed to low levels.

CONCLUSIONS: These findings indicate that volcanic ash emissions adversely affected the respiratory health of Montserrat children.

Language: English

Keywords: Cross-sectional study / Children / Asthma / Respiratory symptoms

Afane Ze E, Roche N, Atchou G, Carteret P, Huchon GJ.

Respiratory symptoms and peak expiratory flow in survivors of the Nyos disaster.

Chest, 1996; 110(5): p.1278-1281

Release of gas from Lake Nyos, 1986, Cameroon

OBJECTIVE: To study the long-term respiratory consequences of the inhalation of volcanic gases after the Nyos disaster. In this event, a massive release of gas occurred from a volcanic crater lake, killing more than 1700 people..

METHODS: Two groups of subjects living in the same area, exposed (Nyos group; n = 381) or not exposed (control group; n = 128) to Nyos gases, were evaluated with a short questionnaire and by measurement of peak expiratory

flow (PEF, percent predicted) 55 months after the event. The questionnaire contained items on demographics, exposure, symptoms, medical history and smoking.

RESULTS: Eleven percent of the subjects smoked, more often men than women (23% versus 4%; $p < 0.001$). In the whole population (exposed and unexposed), smoking was associated with a three-fold increase in the frequency of cough ($p < 0.001$) and with a six-fold increase in the frequency of sputum production ($p < 0.005$), but not with a decrease in PEF. There was no difference in the frequency of dyspnea, cough, sputum production, and PEF between Nyos and control groups.

CONCLUSIONS: These results indicate that four to five years after the emanation of gases from Nyos volcanic lake, there was no difference in respiratory symptoms, and PEF between survivors who inhaled volcanic gases and control subjects, whereas smoking was associated with cough and sputum production.

Language: English

Keywords: Control group comparison / Respiratory symptoms

2.5 AVALANCHES AND LANDSLIDES

Finnsdottir T, Elklit A.

Posttraumatic sequelae in a community hit by an avalanche.

Journal of Traumatic Stress, 2002; 15(6): pp.479-485

Avalanche, 1995, Flateyri, Iceland

OBJECTIVE: To study the posttraumatic sequelae in adults who survived an avalanche in the fishing town of Flateyri in Iceland (400 inhabitants).

Twenty people died in this event.

METHODS: Ten weeks after the disaster, 104 inhabitants of Flateyri were included in this study. Eighty-seven adults from the neighbouring town of Thingeyri constituted a control group. Measures used were the Impact of Event Scale (IES), General Health Questionnaire (GHQ-30), Posttraumatic Symptom Scale (PTSS-10) and Social Readjustment Rating Scale (SRRS).

RESULTS: Twenty-five percent of the Flateyri group (twice as many as the controls) reached a level of psychiatric caseness. The most common symptoms were intrusive thoughts and feelings, tension, sadness, and anxiety. The loss of family members was associated with symptomatology. A high number of former life events correlated more strongly with distress

symptoms than with the individual appraisal of these events. Distress symptoms were related to gender, age, and education.

CONCLUSIONS: These results show that an avalanche can have psychological effects similar to other natural disasters. After 10 weeks, a massive impact of the disaster was found in the inhabitants of the affected town.

Language: English

Keywords: Control group comparison / Posttraumatic symptoms / Psychological distress / Depressed feeling / Anxiousness / Risk factors

Catapano F, Malafronte R, Lepre F, Cozzolino P, Arnone R, Lorenzo E, Tartaglia G, Starace F, Magliano L, Maj M.

Psychological consequences of the 1998 landslide in Sarno, Italy: a community study.

Acta Psychiatrica Scandinavica, 2001; 104(6): pp.438-442

Landslide, 1998, Sarno, Italy

OBJECTIVE: To study the prevalence of post-traumatic stress disorder (PTSD) and psychosocial problems in survivors of the landslide in Sarno (32,000 inhabitants), Italy, in which 137 people died.

METHODS: A random sample (n = 272) of the population living in the highest risk area of Sarno and a control group recruited in a small town situated near the disaster area, but not affected by the event, were assessed one year after the disaster. Measures used were the General Health Questionnaire (GHQ-30), the Self-Rating Scale for Post-Traumatic Stress Disorder (SRS-PTSD) and a 34-item socio-demographic form.

RESULTS: Of the subjects recruited in Sarno, 27% met DSM-IV criteria for PTSD, versus 1.4% of the controls; 59% of subjects recruited in Sarno and 35% of the control group were identified as "probable cases" by the GHQ-30. Subjects recruited in Sarno had significantly higher scores on the four GHQ-30 subscales identified by factor analysis.

CONCLUSIONS: This study emphasizes the negative impact of a natural catastrophic event on mental health, and the need for preventive interventions.

Language: English

Keywords: Control group comparison / Posttraumatic symptoms / Psychological distress

2.6 BUSHFIRES

McFarlane AC, Papay P.

Multiple diagnoses in posttraumatic stress disorder in the victims of a natural disaster.

Journal of Nervous and Mental Disease, 1992; 180(8): pp.498-504
Bushfires, 1983, Australia

OBJECTIVE: To study the incidence and comorbidity of affective, anxiety and posttraumatic stress disorders in firefighters who had been exposed to Australian bushfires.

METHODS: A representative group of trained volunteer firefighters (n = 469) was screened at four, 11, and 29 months after a natural disaster using the General Health Questionnaire (GHQ). On the basis of these data, a high-risk group of subjects who scored as cases and probable cases and a symptom-free comparison group were interviewed using the Diagnostic Interview Schedule, 42 months after the disaster.

RESULTS: PTSD was the most prevalent disorder (18%), followed by major depression (10%), while the prevalence of anxiety disorders varied between 7% and 8.5%. With respect to comorbidity, 51% of the subjects with PTSD experienced major depressive disorder, 39% generalized anxiety disorder, 37% panic disorder, 33% phobic disorder, 13% obsessive-compulsive disorder and 8% a manic episode. With respect to the course of the disorders, more than 60% had resolved by 42 months, except for phobic disorder (55% remained) and panic disorder (48% remained). There was a greater chance that PTSD would remain if there was a coexistent panic or phobic disorder.

CONCLUSIONS: Only 23% of the 70 subjects who had developed a PTSD did not attract a further diagnosis, with major depression being the most common concurrent disorder. Comorbidity appeared to be an important predictor of chronic PTSD, especially with panic disorder and phobic disorders. The subjects who had only PTSD, without comorbidity, appeared to have had the highest exposure to the disaster. Adversity experienced both before and after the disaster influenced the onset of both anxiety and affective disorders.

Language: English

Keywords: Longitudinal study / Rescue workers / PTSD / Depression / Anxiety disorder / Comorbidity

Aditama TY.

Impact of haze from forest fire to respiratory health: Indonesian experience.

Respirology, 2000; 5(2): pp.169-174

Bushfires, 1997, Indonesia

OBJECTIVE: To describe the impact of haze from forest fires in Indonesia based on respiratory health. In 1997, several fires occurred in 12 provinces of Indonesia, in which 5.3 million hectares were burned. Millions of people were affected; public places had to be closed, people were kept indoors due to hazardous levels of air pollution and many sought treatment for respiratory, eye and skin ailments.

METHODS: Data were collected from personal reports from pulmonologists and province/district health offices and hospitals in the area, especially reporting on the TSP (Total Suspended Particulate) and CO in the haze.

RESULTS: The most significant health impact of the haze disaster observed in the affected areas include ARI (Acute Respiratory Infection), asthma, diarrhoea, eye irritation and skin disease. The number of ARI cases decreased significantly in tandem with the reduction of forest fire. Many respiratory patients had a worsening of symptoms during the haze. Mortality was increased by two to four times, mainly caused by respiratory failure in advanced tuberculosis patients.

CONCLUSIONS: These data show that there was a significant impact of haze on the human lung: a significant increase in respiratory conditions, lung function complaints and other related impacts.

Language: English

Keywords: Cross-sectional study / Respiratory symptoms

3 ABSTRACTS OF ARTICLES ON MAN-MADE DISASTERS

3.1 TERRORISM

Baca E, Cabanas ML, Baca-Garcia E.

Impacto de los atentados terroristas en la morbilidad psiquiátrica a corto y largo plazo.

(Terrorist attacks and short-long time psychiatric morbidity.)

Actas Españolas de Psiquiatría, 2002; 30(2): pp.85-90

Terrorism, general.

OBJECTIVE: To study both the short-term and long-term prevalence of psychiatric disorders in victims of terrorist attacks.

METHODS: About 3,000 members of 544 families of victims in 426 different terrorist attacks were interviewed. One thousand and ninety-four persons from this group filled in the General Health Questionnaire-28 (GHQ-28). This sample was divided into direct victims (DV), direct victims' relatives (DVR) and people who met both of these two criteria (DVDVR).

RESULTS: About 39% of the sample had a probable psychiatric disorder. Psychiatric prevalence was increased in DVDVR (54%) and DV (52%) compared to the general population (10-25%). The study sample showed higher levels of poor mental health than the general population in both the short run (0-2 years) (DVR 40%, DV 66%, DVDVR 75%), and the long run (18-20 years) (DVR 35%, DV 37%, DVDVR 37%).

CONCLUSIONS: Both those who have experienced a terrorist attack and their family members have worse mental health than the general population in both the short and long term.

Language: Spanish

Keywords: Cross-sectional study / Mental disorders / Psychological distress

Banauch GI, Alleyne D, Sanchez R, Olender K, Cohen HW, Weiden M, Kelly KJ, Prezant DJ.

Persistent hyperreactivity and reactive airway dysfunction in firefighters at the World Trade Center.

American Journal of Respiratory and Critical Care Medicine, 2003; 168(1): p.54-62

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To determine if bronchial hyperreactivity was present and associated with exposure intensity, and to identify objective predictors of persistent hyperreactivity and reactive airways dysfunction six months after the September 11th terrorist attack in rescue workers who were exposed to airborne particulates. This event had a significant social and economic impact on the city, with nearly 3,000 deaths and the destruction of a large part of Manhattan.

METHODS: A representative sample of 179 rescue workers stratified by exposure intensity (high, moderate, and control) without current smoking or prior respiratory disease was enrolled. Highly exposed workers arrived within two hours of collapse, moderately exposed workers arrived later on Days one and two; control subjects were not exposed. The subjects were enrolled during medical monitoring one and three months post-disaster and were offered methacholine challenge testing one, three and six months post-disaster. The monitoring included an occupational health questionnaire, spirometry, chest radiograph and other laboratory evaluations. The Methacholine Challenge Testing was performed with spirometer and methacholine.

RESULTS: Hyperreactivity at one, three, and six months post-collapse was associated with exposure intensity, independent of ex-smoking and airflow obstruction. Six months post-collapse, highly exposed workers were seven times more likely than moderately exposed workers and control subjects to be hyperreactive, and hyperreactivity persisted in 55% of those hyperreactive at one and/or three months. In highly exposed subjects, hyperreactivity one or three months post-collapse was the sole predictor for reactive airways dysfunction.

CONCLUSIONS: Development and persistence of hyperreactivity and reactive airways dysfunction were strongly and independently associated with exposure intensity. Hyperreactivity shortly post-collapse predicted reactive airways dysfunction at six months in highly exposed workers; this has important implications for disaster management.

Language: English

Keywords: Longitudinal study / Rescue workers / Respiratory symptoms / Risk factors

Chen H, Chung H, Chen T, Fang L, Chen JP.

The emotional distress in a community after the terrorist attack on the World Trade Center.

Community Mental Health Journal, 2003; 39(2): pp.157-165

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To study the psychological impact of the September 11th terrorist attack on the immediate neighbourhood of the World Trade Centre.

METHODS: A sample of 555 residents from the local Chinatown community, all Chinese Americans, participated in the study. They were surveyed five months after the disaster, and retrospectively asked about their emotional distress immediately after the tragedy and five months later. Self-administered questionnaires were used.

RESULTS: Anxiety was prevalent in the community residents and depression in those who lost family members or friends. The mental health condition of the community improved tremendously five months later; the initial 59% of community residents reporting four or more emotional symptoms dropped to 17%. However, more than half of the community residents had persistently shown one or more symptoms of emotional distress. Those who had lost a family member or friend in the disaster showed significantly higher distress, with 90% of them reporting four or more major psychiatric symptoms during the first few weeks after the disaster, and this rate dropped to 35% five months later. Overall, those in their 40s and 50s seemed to report relatively higher emotional distress than both younger and older groups.

CONCLUSIONS: People living in the immediate neighbourhood of the World Trade Centre experienced considerably high levels of emotional distress during the first weeks after the attacks. A significant decrease of symptoms was found five months later.

Language: English

Keywords: Cross-sectional study / Psychological distress / Anxiousness / Depressed feeling

DeLisi LE, Maurizio A, Yost M, Papparozi CF, Fulchino C, Katz CL, Altesman J, Biel M, Lee J, Stevens P.

A survey of New Yorkers after the Sept. 11, 2001, terrorist attacks.

American Journal of Psychiatry, 2003; 160(4): pp.780-783

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To examine the prevalence of posttraumatic symptoms among residents in Manhattan 3-6 months after the September 11th terrorist attacks.

METHODS: A total of 1,009 adults (516 men and 493 women) were interviewed about their emotional status. The Davidson Trauma Scale was used to measure posttraumatic symptoms.

RESULTS: A total of 56% had at least one severe or two or more mild to moderate symptoms. Women reported significantly more symptoms than men. Loss of employment, place of residence, and the death of a family member or friend correlated with greater and more severe symptoms. The most distressing experiences appeared to be painful memories and reminders; dissociation was rare. Only 27% of individuals with severe symptoms were receiving treatment.

CONCLUSIONS: Over half the individuals had some emotional sequelae 3-6 months after the attacks but the percentage was decreasing. Only a small portion of those with severe responses was seeking treatment.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms

Fagan J, Galea S, Ahern J, Bonner S, Vlahov D.

Relationship of self-reported asthma severity and urgent health care utilization to psychological sequelae of the September 11, 2001 terrorist attacks on the World Trade Center among New York City area residents.

Psychosomatic Medicine, 2003; 65(6): p.993-996

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To study the relationship between the psychological sequelae of the September 11th terrorist attack and asthma symptom severity and the utilisation of urgent health care services for asthma since the event.

METHODS: A random digit dial telephone survey was performed six to nine months after the attack. Two thousand seven hundred fifty-five demographically representative adults including 364 asthmatics were recruited. Interviews were conducted in which asthma symptom severity, emergency room (ER) visits, and unscheduled physician office visits for asthma since the event were assessed. The following measures were used to assess psychological effects: Diagnostic Interview Schedule (DIS), National Women's Study (NWS) PTSD module of the Structured Clinical Interview (SCID) and a modified version of the SCID for major depression.

RESULTS: After adjustment for asthma measures before the attack, demographics, and event exposure in multivariate models posttraumatic stress disorder (PTSD) were a significant predictor of self-reported moderate-to-severe asthma symptoms (OR = 3.4), seeking care for asthma at an ER since September 11 (OR = 6.6), and unscheduled physician visits for asthma since September 11 (OR = 3.6). The number of PTSD symptoms was also significantly related to moderate-to-severe asthma symptoms and

unscheduled physician visits since September 11th. Neither a panic attack on the event nor depression since the event was an independent predictor of asthma severity or utilisation of health services.

CONCLUSIONS: PTSD related to the September 11th terrorist attacks contributed to symptom severity and the utilisation of urgent health care services among asthmatics in the New York City metropolitan area.

Language: English

Keywords: Cross-sectional study / Asthma / Anxiety disorder / PTSD / Depression / Risk factors / Health services utilisation

Galea S, Vlahov D, Resnick H, Ahern J, Susser E, Gold J, Bucuvalas M, Kilpatrick D.

Trends of probable post-traumatic stress disorder in New York City after the September 11 terrorist attacks.

American Journal of Epidemiology, 2003; 158(6): pp.514-524

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To study trends in the prevalence of posttraumatic stress disorder (PTSD) in the general population of New York City in the first six months after the September 11th terrorist attacks.

METHODS: Three random digit-dialling telephone surveys among adults in the New York City metropolitan area were conducted one month, four months, and six months after the attacks. A total of 1,008, 2,001 and 2,752 demographically representative adults were recruited in these three surveys, respectively. Interviews were conducted using structured questionnaires, including a modified version of the Diagnostic Interview Schedule, used to measure PTSD symptoms.

RESULTS: The prevalence of PTSD related to the September 11th attacks in Manhattan declined from 7.5% one month after September 11th to 0.6% six months after September 11th. Although the prevalence of posttraumatic symptoms was consistently higher among persons who were more directly affected by the attacks, a substantial number of persons who were not directly affected by the attacks also met criteria for probable PTSD.

CONCLUSIONS: These data suggest a rapid resolution of most of the probable PTSD in the general population of New York City in the first six months after the attacks. The psychological consequences of a large-scale disaster in a densely populated urban area may extend beyond persons directly affected by the disaster to persons in the general population.

Language: English

Keywords: Longitudinal study / PTSD

Galea S, Ahern J, Resnick H, Kilpatrick D, Bucuvalas M, Gold J, Vlahov D.
Psychological sequelae of the September 11 terrorist attacks in New York City.

New England Journal of Medicine, 2002; 346(13): pp.982-987

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To assess the prevalence and correlates of acute posttraumatic stress disorder (PTSD) and depression among residents of Manhattan five to eight weeks after the September 11th terrorist attacks.

METHODS: Random-digit dialling was used to recruit a representative sample of adults living in Manhattan. Participants were interviewed about demographic characteristics, exposure to the events, and psychological symptoms afterwards. A modified version of the Diagnostic Interview Schedule was used to measure PTSD and a modified version of the Structured Clinical Interview (DSM-IV) was used to measure depression.

RESULTS: Among 1,008 adults interviewed, 7.5% reported symptoms consistent with a diagnosis of current PTSD related to the attacks, and 9.7 % reported symptoms consistent with current depression. Among respondents who lived south of Canal Street (i.e., near the World Trade Centre), the prevalence of PTSD was 20 %. Predictors of PTSD were Hispanic ethnicity, two or more prior stressors, a panic attack during or shortly after the events, residence south of Canal Street, and loss of possessions due to the events.

Predictors of depression were Hispanic ethnicity, two or more prior stressors, a panic attack, a low level of social support, the death of a friend or relative during the attacks, and loss of a job due to the attacks.

CONCLUSIONS: There was a substantial amount of acute PTSD and depression in Manhattan after the September 11th attacks. Experiences involving exposure to the attacks were predictors of current PTSD, and losses as a result of the events were predictors of current depression.

Language: English

Keywords: Cross-sectional study / PTSD / Depression / Risk factors

Silver RC, Holman EA, McIntosh DN, Poulin M, Gil-Rivas V.

Nationwide longitudinal study of psychological responses to September 11.

JAMA, 2002; 288(10): pp.1235-1244

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To examine whether demographic characteristics, mental and physical health history, lifetime exposure to stressful events, September 11th related experiences, and coping strategies were related to psychological outcomes after the September 11th terrorist attacks.

METHODS: A national probability sample of 3,496 adults received a Web-based survey; 2,729 individuals (78% participation rate) completed it between 9 and 23 days after the terrorist attacks. A random sample of 1,069 panellists residing outside New York was drawn from the wave one sample (n = 2,729) and received a second survey; 933 (87% participation rate) completed it approximately two months following the attacks. A third survey (n = 787) was completed approximately six months after the attacks. The main outcome measures were September 11th related symptoms of acute stress (a modified version of the Stanford Acute Stress Reaction Questionnaire, SASRQ), posttraumatic stress (Impact of Event Scale, IES), and global distress (Hopkins Symptom Checklist, HSCL).

RESULTS: Seventeen percent of the population outside of New York City reported symptoms of September 11th related posttraumatic stress two months after the attacks; six percent did so at six months. High levels of posttraumatic stress symptoms were associated with female sex (odds ratio [OR], 1.64), marital separation (OR, 2.55), pre-September 11th physician-diagnosed depression or anxiety disorder (OR, 1.84) or physical illness (OR, 0.93), severity of exposure to the attacks (OR, 1.31), and early disengagement from coping efforts (e.g., giving up: OR, 1.68; denial: OR, 1.33; and self-distraction: OR, 1.31). In addition to demographic and pre-September 11th health variables, global distress was associated with severity of loss due to the attacks and early coping strategies (e.g., increased with denial and giving up and decreased with active coping).

CONCLUSIONS: The psychological effects of a major national trauma are not limited to those who experience it directly, and the degree of response is not predicted simply by objective measures of exposure to or loss from the trauma. Instead, use of specific coping strategies shortly after an event is associated with symptoms over time. In particular, disengaging from coping efforts can signal the likelihood of psychological difficulties up to six months after a trauma.

Language: English

Keywords: Longitudinal study / Posttraumatic symptoms / Psychological distress / Coping / Risk factors

Vlahov D, Galea S, Resnick H, Ahern J, Boscarino JA, Bucuvalas M, Gold J, Kilpatrick D.

Increased use of cigarettes, alcohol, and marijuana among Manhattan, New York, residents after the September 11th terrorist attacks.

American Journal of Epidemiology, 2002; 155(11): pp.988-996

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To examine the prevalence of substance use after the September 11th terrorist attacks.

METHODS: A random digit-dial telephone survey was conducted to estimate the prevalence of increased cigarette smoking, alcohol consumption, and marijuana use among residents of Manhattan, New York City, 5-8 weeks after the attacks.

RESULTS: Among 988 persons included, 29% reported an increase in use of any of these three substances, 10% reported an increase in smoking, 24% reported an increase in alcohol consumption, and 3% reported an increase in marijuana use. Persons who increased smoking of cigarettes and marijuana were more likely to experience posttraumatic symptoms than those who did not (24% vs. 5% for cigarettes; 36% vs. 6% for marijuana). Depression was more common among those who increased than for those who did not increase cigarette smoking (22% vs. 8%), alcohol consumption (15% vs. 8%), and marijuana smoking (22% vs. 9%).

CONCLUSIONS: These results suggest a substantial increase in substance use in the immediate post-disaster period after the September 11th attacks. Increased use of different substances may be associated with the presence of different comorbid psychiatric conditions.

Language: English

Keywords: Cross-sectional study / Substance abuse / Posttraumatic symptoms / Depressed feeling

Warren T, Lee, S, Saunders S.

Factors influencing experienced distress and attitude toward trauma by emergency medicine practitioners.

Journal of Clinical Psychology in Medical Settings, 2003; 10(4): pp.293-296

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To study the association between proximity and degree of exposure to the September 11th terrorist attacks and psychological distress in emergency medicine practitioners.

METHODS: A group of 35 emergency care workers from New York was compared to a group of 73 emergency care workers, geographically distant from the disaster site (Wisconsin). A survey was mailed to them four weeks following the event and included seven items related to previous training, and the respondents' personal and professional experiences related to the September 11th attacks.

RESULTS: Health care practitioners from New York reported more emotional distress than health care workers from Wisconsin, although not to a significant degree. However, having treated an injured victim of the terrorist attack did significantly influence the amount of psychological distress. Other variables associated with higher distress levels included the discipline of the practitioners, and personally knowing a victim of the terrorist attack. Previous training related to vicarious traumatization was not associated with lower levels of distress for practitioners.

CONCLUSIONS: These results lend support to the presence of a dose-response relationship within vicarious traumatization.

Language: English

Keywords: Control group comparison / Rescue workers / Psychological distress

Wolinsky FD, Wyrwich KW, Kroenke K, Babu AN, Tierney WM.

9-11, personal stress, mental health, and sense of control among older adults.

Journal of Gerontology: Social Sciences, 2003; 58(3): pp.S146-150

World Trade Centre Terrorist attack, 2001, New York, United States

OBJECTIVE: To study the effects of the September 11th terrorist attacks on personal stress, mental health, or sense of control in the elderly.

METHODS: A longitudinal study was carried out in which personal stress, mental health, and sense of control were measured at baseline and at six bimonthly follow-up interviews among 1,662 patients with coronary artery disease, congestive heart failure, COPD or asthma. Of these, 437 had the opportunity to complete three interviews before and after the event, with 291 (67%) completing all six. Measures used were the National Opinion Research Centre (NORC) National Health Survey scale, the Mental Health Inventory scale (MHI) from the Medical Outcomes Study, the 36-Item Short Form Health Survey (SF-36) and an measure of sense of control.

RESULTS: No noticeable changes in aggregate trends for personal stress or mental health were associated with the event. However, the disaster was associated with an aggregate decline in sense of control. This decline in

sense of control was greater among those with paid jobs, those who had more comfortable incomes, and those who reported greater religiosity.
CONCLUSIONS: Older adults more closely resembling those who died during the terrorist attack and those with greater levels of religiosity were most likely to have their sense of control affected by this catastrophic event.

Language: English

Keywords: Pre-post comparison / Elderly / Psychological distress

North CS, Tivis L, McMillen JC, Pfefferbaum B, Spitznagel EL, Cox J, Nixon S, Bunch KP, Smith EM.

Psychiatric disorders in rescue workers after the Oklahoma City bombing.

American Journal of Psychiatry, 2002; 159(5): pp.857-859

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To study the psychiatric after-effects among rescue workers after the Oklahoma City bombing. In this event, 167 people were killed.

METHODS: Approximately 34 months after the disaster, a group of 181 fire-fighters was studied who had served as rescue/recovery workers.

Psychopathology before and after the bombing was assessed retrospectively with the Diagnostic Interview Schedule (DIS). Findings for male rescue workers were compared with those of male primary victims who had been in the direct path of the blast and who had been assessed with the same instrument.

RESULTS: The prevalence of posttraumatic stress disorder related to the bombing was significantly lower in male rescue workers (13%) than in male primary victims (23%). High rates of alcohol disorders (post-disaster: 24%; lifetime: 47%) were seen among all rescue workers, with only two percent new cases occurring after the bombing.

CONCLUSIONS: The resilience seen in fire-fighters may be related to their career selection, their preparedness and experience, the fewer injuries they suffered, and post-disaster mental health interventions. However, alcohol disorders were already present before the disaster, indicating a need for ongoing programs targeting this problem.

Language: English

Keywords: Cross-sectional study / Rescue workers / PTSD / Depression / Anxiety disorder / Substance abuse

North CS.

The course of post-traumatic stress disorder after the Oklahoma City bombing.

Military Medicine, 2001; 166(12 Suppl): pp.51-52

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To examine the longitudinal course of posttraumatic stress disorder (PTSD) and other psychiatric disorders in survivors of the Oklahoma City bombing.

METHODS: A sample of survivors (n = 182) was studied on average six months post-bombing; of these, 141 were reassessed approximately one year later. The Diagnostic Interview Schedule (DIS) was used to assess lifetime, current, pre-disaster, and post-bombing psychiatric diagnoses at both assessment points.

RESULTS: One-third (34%) of the Oklahoma City bombing survivors met criteria for PTSD at index, and similar rates were diagnosed at follow-up. The most common other diagnosis was major depression, present in 23%. While depression showed more than 50% recovery at follow-up, recovery rates from PTSD were lower. No delayed onset PTSD was observed, and all PTSD was chronic. Avoidance and numbing symptoms were dominant in defining the development of PTSD.

CONCLUSIONS: Early onset and chronicity of PTSD indicate a need for prompt and long-term intervention after disasters. Focus on avoidance and numbing symptoms may aid in identification of individuals needing intervention.

Language: English

Keywords: Longitudinal study / PTSD / Depression

Pfefferbaum B, Doughty DE, Reddy C, Patel N, Gurwitch RH, Nixon SJ, Tivis RD.

Exposure and peritraumatic response as predictors of posttraumatic stress in children following the 1995 Oklahoma City bombing.

Journal of Urban Health, 2002; 79(3): pp.354-363

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To examine the role of peri-traumatic response in posttraumatic stress reactions among children after the Oklahoma City bombing.

METHODS: A sample of 2,381 middle school children was examined seven weeks after the bombing. Most of them had been in school at the time of the

explosion and therefore had not been in direct physical proximity to the incident. The Posttraumatic Stress Scale (PTSS), an adapted version of the Impact of Event Scale-Revised (IES-R), was used to address posttraumatic stress reactions.

RESULTS: Physical, interpersonal, and television exposure accounted for 12% of the total variance in the measure of posttraumatic stress when peri-traumatic response was ignored. Peri-traumatic response and television exposure accounted for 25% of the total variance, and physical and interpersonal exposure were not significant in this context.

CONCLUSIONS: These findings suggest the importance of peri-traumatic response in children's reactions to terrorism. These early responses can be used to help identify which children may experience difficulty over time.

Language: English

Keywords: Cross-sectional study / Children / Posttraumatic symptoms / Mass media / Risk factors

Pfefferbaum B, Nixon SJ, Tucker PM, Tivis RD, Moore VL, Gurwitsch RH, Pynoos RS, Geis HK.

Posttraumatic stress responses in bereaved children after the Oklahoma City bombing.

Journal of the American Academy of Child and Adolescent Psychiatry, 1999; 38(11): pp.1372-1379

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To study posttraumatic stress responses in children who were exposed to the Oklahoma City bombing, and to compare bereaved children with non-bereaved ones.

METHODS: Exposure, personal consequences, initial response, and current posttraumatic stress and other symptoms were assessed in a group of 3,218 middle and high school students seven weeks after the disaster. Measures used were the Posttraumatic Stress Scale (PTSS), an adapted version of the Impact of Event Scale-Revised (IES-R), the Physical Exposure Variable (PEV) and the Other Exposure Variable (OEV).

RESULTS: More than one third of the sample knew someone killed in the explosion. Bereaved children were more likely than their non-bereaved peers to report immediate symptoms of arousal and fear, changes in their home and school environment, and posttraumatic stress symptoms. Retrospective measures of initial arousal and fear predicted posttraumatic stress symptoms at seven weeks.

CONCLUSIONS: These results support earlier findings about the important role of initial response in posttraumatic stress symptom development. The results also raise concerns about the impact of television exposure, and traumatised children's reactivity to it, in the aftermath of disasters.

Language: English

Keywords: Cross-sectional study / Children / Posttraumatic symptoms / Bereavement / Mass media

Shariat S, Mallonee S, Kruger E, Farmer K, North C.

A prospective study of long-term health outcomes among Oklahoma City bombing survivors.

Journal of the Oklahoma State Medical Association, 1999; 92(4): pp.178-186

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To identify long-term physical and emotional outcomes among Oklahoma City bombing survivors.

METHODS: Baseline data were gathered by the Oklahoma State Department of Health in 1995. Follow-up data were gathered by telephone interviews of survivors from one-and-a-half to three years after the bombing. The frequency of medical diagnoses, symptoms, medical costs, physical and social life changes, and health care services utilisation since the bombing were assessed. Questions included symptoms of PTSD as described in the DSM-IV. Additionally, the Health Status Questionnaire (HSQ-12) was used. In total, 494 persons were interviewed, of which 92 % had been physically injured in the bombing.

RESULTS: Seventy-nine percent of persons interviewed rated their general health status as "good," "very good," or "excellent." Overall, one-fourth to one-third of the survivors reported being newly diagnosed with audiological changes, anxiety, and depression since the bombing. One-third of the persons reported pre-existing medical conditions that had worsened since the bombing, including depression (26%) and asthma/bronchitis (22%). The most frequently reported posttraumatic stress symptoms were "being jumpy or easily startled" and "recurring distressful thoughts of the bombing." The most frequently utilised health care services were psychological counselling (63%) and audiology services (48%). Total costs were estimated at \$ 5.7 million. Overall, persons who had been hospitalised with bombing injuries reported higher rates of diagnoses, symptoms, and services utilisation.

CONCLUSIONS: The findings suggest that a large proportion of survivors of a terrorist bombing, especially those seriously injured, will experience

long-term physical and/or emotional outcomes and increased need for treatment for bombing-related medical conditions. All survivors should be carefully assessed over time for auditory damage, depression, anxiety, and posttraumatic stress disorder.

Language: English

Keywords: Longitudinal study / Symptoms / Depressed feeling / Anxiousness / Posttraumatic symptoms / Health services utilisation

Smith DW, Christiansen EH, Vincent R, Hann NE.

Population effects of the bombing of Oklahoma City.

Journal of the Oklahoma State Medical Association, 1999; 92(4): pp.193-198

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To study the impact of the Oklahoma City bombing on the general population.

METHODS: Surveys were conducted in the Oklahoma City metropolitan area and in a control area (Indianapolis) to measure exposure and impact, primarily stress and psychological distress. Interviews were held a few months after the bombing, and again in 1996, about a year later. There were about 1,000 respondents in the Oklahoma City area and about 700 in the control area. The exposure to the bombing and its direct effects - like injury, damage to home and personal involvement - and effects such as psychological stress, posttraumatic symptoms and depression were assessed.

RESULTS: Of the adults in the Oklahoma City area, 61% reported experiencing at least one direct result of the bombing. In population terms, about 433 thousand adults were exposed to one or more of the consequences of the bombing. Oklahomans reported higher rates (about double) of increased alcohol use, increased smoking or starting smoking. They reported more stress (about double), psychological distress (about double), posttraumatic symptoms, and intrusive thoughts (double) related to the bombing than in the control area. Oklahomans also reported higher rates of seeking help for their stress or taking steps to reduce stress. The differences persisted into 1996, more than a year after the bombing.

CONCLUSIONS: The exposure to the bombing was widespread, including more than half the adults in the metropolitan area surrounding Oklahoma City. The psychological effects were high and, while decreasing, persisted more than a year after the bombing. Primary care practitioners should screen their patients, who may normally not be considered victims, for exposure to the effects of a terrorist disaster for an extended period of time.

Language: English

Keywords: Longitudinal study / Control group comparison / Psychological distress / Posttraumatic symptoms / Substance abuse / Health services utilisation

Sprang G.

Post-disaster stress following the Oklahoma City bombing: an examination of three community groups.

Journal of Interpersonal Violence, 1999; 14(2): pp.169-183

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To study the nature and course of the post-disaster response to the Oklahoma City bombing. It was hypothesised that an individual's post-disaster reaction would resemble a linear function of the degree of exposure experienced.

METHODS: The sample consisted of 244 adult residents of Oklahoma City. A control group of 228 individuals was drawn from a city of similar size, 800 miles away. Participants were interviewed six months after the bombing, using the Traumatic Experiences Inventory (TEI) to measure post-disaster stress.

RESULTS: Based on their level of exposure and proximity to the events, the respondents were divided into three groups: high exposure group, low exposure group and the control group. The high exposure group had higher overall PTSD scores than the other two groups. In addition, both exposed groups had higher victimisation scores compared to the control group. Among those with diagnosable PTSD, there were no significant differences in the use of mental health services following the disaster.

CONCLUSIONS; These findings partially support the stated hypotheses. As expected, the Oklahoma City groups reported higher levels of post-disaster disturbance than the control group, although only PTSD and victimisation could be used to differentiate among the three groups.

Language: English

Keywords: Control group comparison / Posttraumatic symptoms

Trautman R, Tucker P, Pfefferbaum B, Lensgraf SJ, Doughty DE, Buksh A, Miller PD.

Effects of prior trauma and age on posttraumatic stress symptoms in Asian and Middle Eastern immigrants after terrorism in the community.

Community Mental Health Journal, 2002; 38(6) pp.459-474

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To study the effects of the Oklahoma City bombing on immigrants by examining the role of prior trauma, age, gender, degree of exposure and initial response in the development of posttraumatic symptoms.

METHODS: Forty-five adult Asian and Middle Eastern immigrants living in Oklahoma City at the time of the bombing were examined one-and-a-half to two years later. The Posttraumatic Stress scale (PTSS), adapted from the Impact of Event Scale (IES) and the Impact of Event Scale – Revised (IES-R), was used. In addition, questions were asked about prior traumatic experiences, exposure and initial responses after the bombing.

RESULTS: Most participants had experienced prior trauma in their homeland. PTSD symptomatology from prior trauma was most predictive of initial physiological and emotional response and of later bomb-related PTSD symptoms. Bomb-related PTSD symptoms increased with current age and were inversely related to age at the time of prior trauma.

CONCLUSIONS: The results underscore the importance of providing long-term disaster assistance to immigrants with prior trauma.

Language: English

Keywords: Cross-sectional study / Immigrants / Posttraumatic symptoms / Risk factors

Tucker P, Pfefferbaum B, Doughty DE, Jones DE, Jordan FB, Nixon SJ.

Body handlers after terrorism in Oklahoma City: predictors of posttraumatic stress and other symptoms.

American Journal of Orthopsychiatry, 2002; 72(4): pp.469-475

Oklahoma City bombing, 1995, Oklahoma City, United States

OBJECTIVE: To study symptoms and predictors of posttraumatic stress and depression in body handlers after the Oklahoma City terrorist bombing.

METHODS: Two years after the bombing a survey was mailed to 135 of the participating body handlers, of whom 51 (38%) responded. The 100-item survey included demographic information, bombing exposure, previous

personal and professional disaster experience, posttraumatic and depressive symptoms at the time of the body handling and one year later, alcohol use following the bombing, feelings about their work, and coping at the time of the study

RESULTS: Although many body handlers were inexperienced and knew someone killed, depressive and posttraumatic symptoms were low post-disaster and decreased significantly after one year. Higher symptomatology and seeking mental health treatment correlated with increases in alcohol use and new physical problems but not with demographics, exposure, or experience. Four respondents with the highest posttraumatic symptoms at both time points showed a pattern of physical problems, increased alcohol use and mental health treatment, suggesting that these should be carefully assessed in body handlers post-disaster.

CONCLUSIONS: These results indicate an unexpected resilience in the majority of the participants in this study.

Language: English

Keywords: Cross-sectional study / Rescue workers / Posttraumatic symptoms / Depressed feeling / Substance abuse

Bleich A, Gelkopf M, Solomon Z.

Exposure to terrorism, stress-related mental health symptoms, and coping behaviors among a nationally representative sample in Israel.

JAMA, 2003; 290(5): pp.612-620

Several terrorist attacks in Israel, since 2000, Israel

OBJECTIVE: To study the level of exposure to terrorist attacks in Israeli society, the prevalence of posttraumatic symptoms, and sense of safety and coping strategies after 19 months of terrorism.

METHODS: A telephone survey was conducted in April-May 2002, in which 512 adult Israeli residents participated. The following measures were used: a modified version of the Stanford Acute Stress Reaction Questionnaire (SASRQ) to examine posttraumatic symptoms, and the COPE questionnaire to assess coping strategies. In addition, questions were asked about feelings of depression, optimism, sense of safety, self-efficacy and help-seeking behaviour.

RESULTS: Of 512 survey participants, 84 (16%) had been directly exposed to a terrorist attack and 191 (37%) had a family member or friend who had been exposed. Of 510 participants who responded to questions about posttraumatic symptoms, 391 (77%) had at least one symptom. Symptom criteria for PTSD were met by 48 participants (9%) and criteria for acute

stress disorder, by one participant; 299 (58%) reported feeling depressed. The majority of respondents expressed optimism about their personal future (82%) and the future of Israel (67%), and expressed self-efficacy with regard to their ability to function in a terrorist attack (74%). Most expressed a low sense of safety with respect to themselves (60%) and their relatives (68%). Few reported a need for professional help (5%). Female sex, sense of safety, and use of tranquillisers, alcohol, and cigarettes to cope were associated with posttraumatic symptoms and symptom criteria for PTSD; level of exposure and objective risk were not. The most prevalent coping mechanisms were active information search about loved ones and social support.

CONCLUSIONS: Considering the nature and length of the Israeli traumatic experience, the psychological impact may be considered moderate. Although the survey participants showed distress and decreased sense of safety, they did not develop high levels of psychiatric distress, which may be related to a habituation process and to coping mechanisms.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Depressed feeling / Coping / Risk factors

Koplewicz HS, Vogel JM, Solanto MV, Morrissey RF, Alonso CM, Abikoff H, Gallagher R, Novick RM.

Child and parent response to the 1993 World Trade Center bombing.

Journal of Traumatic Stress, 2002; 15(1): pp.77-85

World Trade Centre terrorist attack, 1993, New York, United States

OBJECTIVE: To study psychological symptoms in children exposed to the World Trade Centre terrorist attack, and to examine the relationship between parents' and children's reactions. Due to the bomb explosion thousands of people were trapped in the building, including schoolchildren on class trips.

METHODS: Nine children who had been trapped in an elevator, 13 who had been on the observation deck, and 27 controls completed the Posttraumatic Stress Reaction Index (PTS-RI) and the Revised Fear Survey Schedule for Children, three and nine months after the event. Parents completed some measures about their children and comparable measures about themselves: Adult Posttraumatic Stress Reaction Index, Fear Survey Schedule II, and Brief Symptom Inventory (BSI).

RESULTS: Exposed children reported posttraumatic stress disorder (PTSD) symptoms and disaster-related fears; their parents reported experiencing PTSD symptoms. Only parents rated children's symptoms as decreasing significantly over time. Association between child symptoms and parent

symptoms increased over time. Children's initial distress predicted parents' distress nine months post-disaster.

CONCLUSIONS: These findings indicate a significant impact of exposure to highly frightening events even in the absence of physical injury or long-term disruption of one's everyday environment. Moreover, parents' long term reactions were strongly influenced by their children's distress. People working with children after such disasters need to take this into account.

Language: English

Keywords: Longitudinal study/ Children/ Parents / Posttraumatic symptoms / Anxiousness / Psychological distress

Kawana N, Ishimatsu S, Kanda K.

Psycho-physiological effects of the terrorist sarin attack on the Tokyo subway system.

Military Medicine, 2001; 166(12 Suppl): pp.23-26

Sarin terrorist attack, 1995, Tokyo, Japan

OBJECTIVE: To study the psychological and physiological symptoms among survivors of the Sarin terrorist attack during the first five years following the event. The attack resulted in 12 deaths and more than 5,000 injuries.

METHODS: A symptom questionnaire ("St. Luke's Questionnaire") was developed and administered two, three, and five years following the Sarin attack. 283 valid questionnaires were returned in 1997 (response rate: 48 %), 206 in 1998 (response rate: 35 %) and 191 in 2000 (response rate 33%).

RESULTS: The most frequently reported physical symptoms were eye symptoms, tiredness, fatigue, muscle stiffness and headache. Psychological symptoms commonly reported were posttraumatic symptoms. These symptoms have continued for five years after the incident

CONCLUSIONS: These results indicate that psychological after-effects remained even five years following the event and that unexplained physical symptoms should not be ignored for the accurate diagnosis of PTSD.

Language: English

Keywords: Longitudinal study / MUPS / Posttraumatic symptoms

Yokoyama K, Araki S, Murata K, Nishikitani M, Okumura T, Ishimatsu S, Takasu N, White RF.

Chronic neurobehavioral effects of Tokyo subway sarin poisoning in relation to posttraumatic stress disorder.

Archives of Environmental Health, 1998; 53(4): pp.249-256

Sarin terrorist attack, 1995, Tokyo, Japan

OBJECTIVE: To examine chronic neurobehavioural effects of acute Sarin poisoning in persons exposed to the Sarin terrorist attack in Tokyo.

METHODS: Subjects were nine male and nine female patients who were exposed to the attack. Eighteen subjects served as controls. Participants were examined six to eight months after the attack. Several neurobehavioural tests were used, as well as a posttraumatic stress disorder checklist, the General Health Questionnaire (GHQ) and the Profile of Mood States (POMS).

RESULTS: The score on the psychomotor performance test was significantly lower in the Sarin cases than in controls. The scores for the GHQ, the fatigue scale of the POMS, and posttraumatic stress disorder checklist were significantly higher in the Sarin cases than in controls. In addition, the results of stepwise multiple regression analysis in 18 Sarin cases revealed that scores for the GHQ, POMS (i.e., fatigue, tension-anxiety, depression, and anger-hostility) together with the paired-associate learning test were significantly associated with posttraumatic symptoms. The association was not significant for the digit symbol test score.

CONCLUSIONS: These results seem to show that a chronic effect on psychomotor performance was caused directly by acute Sarin poisoning, whereas the effects on psychiatric symptoms and fatigue appeared to result from posttraumatic symptoms induced by exposure to Sarin.

Language: English

Keywords: Control group comparison / Neurobehavioural symptoms / Posttraumatic symptoms / Psychological distress / Depressed feeling / Anxiousness

North CS, McCutcheon V, Spitznagel EL, Smith EM.

Three-year follow-up of survivors of a mass shooting episode.

Journal of Urban Health, 2002; 79(3): pp.383-391

Mass shooting at Luby's cafeteria, 1991, Killeen, Texas, United States

OBJECTIVE: To study the course of posttraumatic stress disorder and depression in survivors of a mass shooting incident in a cafeteria in Texas. In this event, 24 people died, including the attacker who shot himself.

METHODS: The Diagnostic Interview Schedule/Disaster Supplement (DIS/DS) was used to assess 116 survivors at one or two months and again one and three years later, with an 85% re-interview rate.

Examining the course of post-disaster posttraumatic stress disorder (PTSD) and major depression in individuals allowed detailed consideration of remissions and delayed detection of disorders not possible from data presenting overall rates across different time frames.

RESULTS: Only about half of the PTSD cases identified at any time over three years were in remission at the three-year follow-up. Those who did not recover from PTSD differed from those who did recover at three years by reporting increased numbers of symptoms over time, especially avoidance and numbing symptoms. Women and people with pre-existing disorders were at greater risk for the development of PTSD; however, these variables did not predict chronicity. Chronicity of PTSD was predicted by functional impairment and seeking mental health treatment at baseline. Chronicity of major depression was predicted by report of family history of depression and paternal alcoholism. No delayed cases of PTSD were identified.

CONCLUSIONS: More studies are needed to compare the characteristics of the course of PTSD which were found in this study with other populations, using consistent methodology to allow valid comparison.

Language: English

Keywords: Longitudinal study / PTSD / Depression / Risk factors

Schwarz ED, Kowalski JM.

Malignant memories: PTSD in children and adults after a school shooting.

Journal of the American Academy of Child and Adolescent Psychiatry, 1991; 30(6): pp.936-944

Shooting incident at an elementary school, 1988, place not mentioned, United States

OBJECTIVE: To examine PTSD and associated symptoms among children and their parents after a school shooting. In this shooting incident, a young woman with a psychiatric history killed one child and injured six others.

METHODS: Sixty-four children and 66 adults were screened for PTSD 6 to 14 months after the shooting. Children were assessed by means of a structured interview, which included the DSM-III based Reaction Index (RI) to examine PTSD. Parents were not interviewed, but completed PTSD self-report measures and other measures about themselves and the child.

RESULTS: Of the adults, three percent met the criteria for PTSD according to conservative thresholds, and 19% according to moderate thresholds. For the children, these percentages were 8% and 27%. In children PTSD was associated with increased physical symptoms, increased restless behaviour, increased visits to the nurse and the development of new fears. In adults, PTSD diagnosis appeared to be associated with retrospective emotional experiences, such as feeling numb, sick and fearful at the time of the disaster.

CONCLUSIONS: These results indicate that about 27% of the children and 19% of the adults exhibited symptoms of an intensity and frequency sufficient to warrant a diagnosis of PTSD. Emotional states mediated the formation of malignant memories leading to symptomatology, suggesting that postdisaster intervention should be offered on the basis of degree of emotional reaction as well as proximity.

Language: English

Keywords: Cross-sectional study / Children / Parents / PTSD

Bouthillon P, Crocq L, Julien H, Noto R.

Stress psychique des victimes des attentats terroristes et ses suites lointaines.

(Psychological stress and its long-term effects in victims of terrorist attacks.)

Urgences, 1990; 9: pp.102-105

Terrorist attacks, 1986, Paris, France

OBJECTIVE: To study immediate and delayed psychological reactions in victims of the terrorist attacks in Paris in 1986. During that year, ten attacks took place, resulting in 247 victims; 216 of them were evacuated to hospitals.

METHODS: Questionnaires were sent to 142 survivors, three years after the event. Forty-three questionnaires were returned.

RESULTS: As far as the immediate reactions are concerned, 28 respondents (65%) reported psycho-physiological stress reactions, 24 (54%) complex psychological reactions like agitation or crying fits, and 23 (54%) stress reactions like anxiousness or depersonalisation. With respect to the reactions three years later, at the time of the survey, 34 respondents (79%) reported posttraumatic stress symptoms, seven respondents (16%) reported phobias and 13 respondents (30%) reported psychosomatic symptoms.

CONCLUSIONS: In view of the importance of the immediate stress reactions and the constancy and seriousness of the delayed reactions,

immediate psychological treatment is necessary to prevent longer term sequelae.

Language: French

Keywords: Cross-sectional study / Posttraumatic symptoms / Psychological distress

Jehel L, Paterniti S, Brunet A, Duchet C, Guelfi JD.

Prediction of the occurrence and intensity of post-traumatic stress disorder in victims 32 months after bomb attack.

European Psychiatry, 2003; 18(4): pp.172-176

Paris subway terrorist attack, 1996, Paris, France

OBJECTIVE: To examine the psychological impact of the terrorist attacks in Paris in 1996 and to identify predictive factors of posttraumatic symptoms.

These attacks resulted in four deaths, and 111 people were injured.

METHODS: Thirty-two victims were evaluated at six and 32 months after the event. Socio-demographic characteristics, clinical data and physical injuries were used to predict the occurrence of posttraumatic symptoms and severity in 32 victims. The Watson's PTSD Inventory (PTSD-I) and the Impact of Event Scale (IES) by Horowitz were used to measure the occurrence and severity of PTSD.

RESULTS: Thirty-eight percent of the participants met PTSD criteria at six months, 25% still had PTSD at 32 months. Women had PTSD 32 months after the bomb attack more frequently than men. Employment status predicted PTSD severity at 32 months. PTSD scores assessed by PTSD-I at six months were significantly and positively associated with IES scores at 32-month follow-up ($r = 0.55$). Psychotropic drug use before the bomb attack significantly predicted both PTSD occurrence and severity at six and 32 months. Physical injuries, employment status and psychotropic drug use before the bomb attack were independent predictors of severity of PTSD at 32 months.

CONCLUSIONS: Bomb attack exposure resulted in persisting PTSD in a significant proportion of victims; the severity at 32 months was predicted by physical injuries and psychotropic drug use before the terrorism attack and by the PTSD score few months after the bomb attack.

Language: English

Keywords: Longitudinal study / Posttraumatic symptoms / Risk factors

Luce A, Firth-Cozens J, Midgley S, Burges C.

After the Omagh bomb: posttraumatic stress disorder in health service staff.

Journal of Traumatic Stress, 2002; 15(1): pp.27-30

Omagh bombing terrorist attack, 1998, Omagh, Northern Ireland

OBJECTIVE: To study levels of PTSD symptomatology in different staff groups at the hospitals working close to the Omagh bombing. In this event, 29 people were killed and 300 injured.

METHODS: Questionnaires were sent to 3,500 staff members, four months after the bombing. Those who fully completed posttraumatic stress measures were included (n = 1,064, 39%). The self-report Posttraumatic Stress Disorder Symptom Scale (PSS-SR) was used. In addition, some questions concerning involvement in the bombing, help sought due to the bombing and experiences of previous traumas were included.

RESULTS: Half of all respondents (n = 536) reported being involved in the event in some way, and involved staff had significantly higher PTSD scores than those not involved. Staff involved both professionally and as civilians, particularly those who witnessed the trauma, or those who had experienced previous emotional problems and trauma, had the highest levels of symptomatology. Among staff involved in the event, 67% sought informal or formal help as a direct result of the bombing; only 18% sought professional help. Those with the highest PTSD symptoms were more likely to receive professional help.

CONCLUSIONS: A large proportion of health care staff working near the Omagh bombing remained distressed five to nine months later, and many did not seek professional help. Services may need to be more proactive in recognising those most at risk.

Language: English

Keywords: Cross-sectional study / Rescue workers / Posttraumatic symptoms / Health services utilisation

Pfefferbaum B, North CS, Doughty DE, Gurwitsch RH, Fullerton CS, Kyula J.

Posttraumatic stress and functional impairment in Kenyan children following the 1998 American Embassy bombing.

American Journal of Orthopsychiatry, 2003; 73(2): pp.133-140

American Embassy terrorist attack, 1998, Nairobi, Kenya

OBJECTIVE: To study posttraumatic stress reactions and functional impairment in children exposed to the American Embassy bombing in Kenya. This terrorist attack resulted in 253 deaths, and about 5,000 people were injured.

METHODS: A sample of 562 school children was examined 8-14 months after the event. The degree of physical exposure to the bombing, peri-traumatic reactions, functional impairment and posttraumatic stress reactions were examined. To measure posttraumatic stress the Posttraumatic Stress Scale (PTSS) was used, which is based on the Impact of Event Scale (IES-R)

RESULTS: Three hundred thirty-six (60%) children heard the bomb, 225 (40%) felt it, and many of the children knew someone injured or killed.

Many children also experienced another trauma either before or after the bombing, with 91% having experienced crime or other human-caused violence and 96% having experienced illness or death. Bombing-related PTSD-scores were significantly higher than PTSD scores due to other traumatic events. PTSD reactions due to other trauma and peri-traumatic reactions were the strongest predictors of bombing-related PTSD scores. Self-reported functional impairment was minimal. Bombing-related PTSD scores accounted for most of the variance in functional impairment.

CONCLUSIONS: The apparent resilience of these children, reflected in their low levels of functional impairment is noteworthy given their trauma histories. This suggests the importance of assessing protective factors.

Language: English

Keywords: Cross-sectional study / Children / Posttraumatic symptoms

Thompson J.

Kuwait Airways hijack: psychological consequences for survivors.

Stress Medicine, 1991; 7: pp.3-9

Hijack of Kuwait Airways airplane, 1988, Kuwait

OBJECTIVE: To study the psychological reactions in British survivors of the hijacking of a Kuwait Airways airplane. With a duration of 16 days, this airplane hijack was the longest in history. Ninety-seven passengers were hijacked. Two Kuwaiti nationals were murdered and thrown out of the plane.

METHODS: Within 10 days of their return to Britain, a questionnaire was sent to the 22 British survivors. They were asked to describe their experiences and they completed the General Health Questionnaire (GHQ), the Impact of Events Scale (IES) and the Eysenck Personality Questionnaire. Six months later, these subjects were asked to complete the GHQ and IES once again.

RESULTS: Completed questionnaires were received from 13 of the 22 subjects. Eight of these were showing probable psychological distress and in three of them this was in the severe category. The most common complaints were of anxiety and intrusive memories, and to a lesser extent an inability to function properly at home and at work. Nine survivors replied to the follow-up six months later. Four of them were above the cut-off point for psychological distress. The IES scores dropped considerably in the six-month period.

CONCLUSIONS: These results show that the hijack involved an extended period of life threat; its effects were felt by all the survivors, though severe levels of distress were experienced by only a minority.

Language: English

Keywords: Longitudinal study / Psychological distress / Posttraumatic symptoms

3.2 AIRPLANE ACCIDENTS

Carlier IV, Gersons BP.

Stress reactions in disaster victims following the Bijlmermeer plane crash.

Journal of Traumatic Stress, 1997; 10(2): pp.329-335

Bijlmermeer airplane crash, 1992, Amsterdam, The Netherlands

OBJECTIVE: To study posttraumatic stress symptoms in victims of the Bijlmermeer plane crash in Amsterdam. This event caused 43 deaths.

METHODS: A sample of 136 victims was recruited, six months after the event. They were interviewed, using the Structured Interview for PTSD (SI-PTSD).

RESULTS: Six months after the disaster 26% of the respondents were suffering from posttraumatic stress disorder (PTSD). The victims' PTSD was strongly associated with material damage and loss.

CONCLUSIONS: The discussion focuses on the distinction between normal and pathological stress reactions and the implications for disaster after-care. Ten percent of respondents who met criteria for PTSD had recovered six months later, without professional treatment; 44% of the respondents who did not meet the PTSD criteria did exhibit posttraumatic symptomatology.

Language: English

Keywords: Cross-sectional study / PTSD

Donker GA, Yzermans CJ, Spreuwenberg P, van der Zee J.

Symptom attribution after a plane crash: comparison between self-reported symptoms and GP records.

British Journal of General Practice, 2002; 52(484): pp.917-922

Bijlmermeer airplane crash, 1992, Amsterdam, The Netherlands

OBJECTIVE: To investigate the consistency between patients' physical and psychological symptoms attributed to the Bijlmermeer crash and GPs' diagnoses and perception of the association with the crash.

METHODS: A comparison was made between self-reported symptoms to a call centre and GPs' medical records on onset and type of symptoms, diagnoses, and GPs' perception of a potential association with the disaster. A sample of 621 patients contacting the call centre and their GPs participated (as in the Dutch health care system every citizen is obliged to register with just one GP). Patients were interviewed by the call centre staff and interview data were recorded in a database. Questionnaires were sent to the consenting patients' GPs, requesting their opinions on whether or not their patients' symptoms were attributable to the effects of the disaster.

RESULTS: The 553 respondents reported on average 4.3 symptoms to the call centre. The majority of these symptoms (74%) were reported to the GP. Of the ten most commonly reported symptoms, fatigue, skin complaints, feeling anxious, dyspnoea, and backache featured in 80% of symptoms reported to the GP. One out of four symptoms was either reported to the GP before the disaster took place, or six or more years afterwards (1998/1999, during a period of much media attention). Depression (7%), posttraumatic stress disorder (PTSD) (5%) and eczema (5%) were most frequently diagnosed by GPs. They related 6% of all reported symptoms to the disaster.

CONCLUSIONS: Most of the symptoms attributed to a disaster by patients were reported to their GP, who related only a small proportion of these to the disaster.

Language: English

Keywords: Cross-sectional study / MUPS / PTSD / Depression / Symptoms

Gersons B, Carlier I, Yzermans J.

'In de Spiegel der emoties': onvoorziene langetermijngevolgen van de Bijlmervliegramp.

(*'In the mirror of emotions': unforeseen long-term consequences of the plane crash in Amsterdam.*)

Maandblad Geestelijke Volksgezondheid, 2000; 55(10): pp.876-888

Bijlmermeer airplane crash, 1992, Amsterdam, The Netherlands

OBJECTIVE: To give an overview of the unforeseen long-term effects of the Bijlmer airplane crash on mental and physical health.

METHODS AND RESULTS: The aftermath of this disaster is divided into two different periods.

In the first period, 1992 – 1995, the emphasis in public information, media coverage, aftercare and monitoring was on the mental health effects. Satisfaction with aftercare was studied and turned out to be good, but posttraumatic stress seemed to be more common and longer lasting than expected.

In the second period, 1995 – 1999, more attention was paid to possible physical health effects, because the content of the plane's cargo was unknown. An exploratory study was initiated, and: physical complaints could be reported to a special telephone number. Common symptoms reported were fatigue, anxiety, depression, concentration problems, respiratory symptoms, skin complaints and musculoskeletal problems. Besides, there was an enormous sense of distrust, because the government was thought to be withholding vital information about the cargo. A Parliamentary Inquiry was held to learn lessons for the future.

CONCLUSIONS: This 'secondary' disaster resulted in chronic stress and medically unexplained physical symptoms. The authors state that an information and advice centre (one counter for all problems) is required to limit this kind of social disturbance.

Language: Dutch

Keywords: Case study / PTSD / MUPS / Symptoms

Boin A, Duin M van, Heyse L.

Toxic fear: the management of uncertainty in the wake of the Amsterdam air crash.

Journal of Hazardous Materials, 2001; 88(2-3): pp.213-234

Bijlmermeer airplane crash, 1992, Amsterdam, The Netherlands

OBJECTIVE: 1) to describe how the Bijlmer airplane crash developed into a public health crisis, and 2) to examine the relationship between long-term crisis management and the growing unease among residents of the Bijlmer area.

METHODS: First, a detailed description is given of the disaster and its aftermath, especially the management of uncertainty among emergency responders, the media, the public and local and national authorities. Second,

an overview is given of studies on health effects. Third, the relationship between the emergence and persistence of these health effects and the activities, or lack of these, on behalf of the public authorities is discussed. RESULTS: While the authorities' management of the emergency created by the initial crash was effective, the long-term crisis management performance was considerably less effective. CONCLUSIONS: It is argued that, particularly in emergencies involving (potentially) hazardous materials, considerable management attention is required to the long-term aftermath rather than seeking a quick declaration of "all clear" or determination that the crisis is over.

Language: English

Keywords: Case study / Posttraumatic symptoms / Crisis management / Public health

Livingston HM, Livingston MG, Fell, S.

The Lockerbie disaster: A 3-year follow-up of elderly victims.

International Journal of Geriatric Psychiatry, 1994; 9(12): pp.989-994
Airplane crash, 1988, Lockerbie, Scotland, United Kingdom

OBJECTIVE: To study the long-term outcome in the elderly who were exposed to the airplane crash in mid-air near Lockerbie. In this event, all the passengers and crew on the airplane and 11 inhabitants of the village of Lockerbie were killed.

METHODS: Thirty-one elderly inhabitants of the village, who survived the air disaster, were assessed in 1989, one year after the event. Nineteen of the sample were interviewed and re-examined two years later. Measures used were the General Health Questionnaire (GHQ-28), Leeds Scales for Depression and Anxiety, Impact of Events Scale (IES) and a checklist for drug history.

RESULTS: Although there was a significant reduction in the incidence of posttraumatic stress disorder (PTSD) and significant improvement across a range of anxiety-based symptoms, 16% of the participants continued to meet DSM-III-R criteria for PTSD. In these subjects, other anxiety-related symptoms and major depression persisted.

CONCLUSIONS: This longitudinal assessment of PTSD in elderly survivors shows that, as with younger subjects, PTSD tends to persist for at least two years after the traumatic event and, for a substantial minority, does not remit within three years.

Language: English

Keywords: Longitudinal study / Elderly / Posttraumatic symptoms / Anxiety disorder / Depression / Psychological distress

Gregg W, Medley I, Fowler-Dixon R, Curran P, Loughrey G, Bell P, Lee A, Harrison G.

Psychological consequences of the Kegworth air disaster.

British Journal of Psychiatry, 1995; 167(6): 812-817

Erratum in: *British Journal of Psychiatry*, 1996; 168(2): pp.254

Airplane crash, 1989, Kegworth, United Kingdom

OBJECTIVE: To quantify psychiatric morbidity among survivors of the Kegworth airplane crash and to identify aetiological factors linked with post-traumatic stress disorder (PTSD). In this event, 38 people died at the scene; nine people died later of their injuries.

METHODS: Sixty-eight of the 79 survivors (86%) were assessed at a clinical interview within one year of the disaster. The majority also completed the General Health Questionnaire (GHQ), the Impact of Events Scale (IES) and the Zung Anxiety and Depression Scales.

RESULTS: Fifty-four of the study group (79%) met DSM-III-R criteria for a psychiatric disorder within one year of the disaster, of whom 27 (50%) had PTSD. Those who saw injured or dead people at the scene, or had sustained less severe injuries as measured by their Injury Severity Scores, or were under 35 years old, were significantly more likely to develop PTSD.

CONCLUSIONS: High rates of psychiatric morbidity are found in survivors of the Kegworth airplane crash. Further studies are needed to identify those at most risk and to evaluate the benefits of psychological intervention.

Language: English

Keywords: Cross-sectional study / PTSD / Anxiety disorder / Depression / Psychological distress

Chung MC, Easthope Y, Chung C, Clark-Carter D.

Traumatic stress and coping strategies of seesternary victims following an aircraft disaster in Coventry.

Stress and Health, 2001; 17(2): pp.67-75

Airplane crash, 1994, Coventry, United Kingdom

OBJECTIVE: To examine traumatic stress reactions and coping strategies in survivors of an airplane crash near Coventry, in which all five crew members died. The airplane crashed onto a woodland area close to the edge of a large

housing state. Hundreds of residents had escaped death and were classified as sesternary victims.

METHODS: Eighty-two survivors participated in this study and were interviewed six months after the disaster. Measures used were the General Health Questionnaire (GHQ), the Impact of Event Scale (IES) and the Ways of Coping Checklist (WOC).

RESULTS: Fifty-six percent scored above the cut-off point in the GHQ. Subjects experienced more intrusion than avoidance behaviour, and there were no significant differences between subjects and standardised samples regarding such behaviour. Confrontive coping, distancing, self-controlling, accepting responsibility, escape-avoidance, and positive reappraisal were used by the subjects significantly more than standardised samples.

Avoidance was predicted by the escape-avoidance coping strategy, intrusion was predicted by distancing and escape-avoidance strategies, and GHQ scores were predicted by distancing and escape-avoidance coping strategies.

CONCLUSIONS: These results show that these survivors exhibited significant traumatic distress, which was partially associated with a model of coping characterised by distancing, escape-avoidance and seeking social support, of which the latter did not seem to account for distress.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Psychological distress / Coping

Epstein RS, Fullerton CS, Ursano RJ.

Posttraumatic stress disorder following an air disaster: a prospective study.

American Journal of Psychiatry, 1998; 155(7): pp.934-938

Airplane crash at air show, Air Force Base, 1988, Ramstein, Germany

OBJECTIVE: To determine predictors of posttraumatic stress disorder (PTSD) in health care workers exposed to the Ramstein air disaster, in order to facilitate early case identification and prevention of subsequent morbidity. Of the approximately 300,000 spectators, 70 died and 500 were injured.

METHODS: Three hundred and fifty-five military medical health care workers were studied over an 18-month follow-up period. Measures used were the SCL-90, Impact of Event Scale (IES) and the Structured Clinical Interviews for DSM-III-R, Non-Patient Edition (SCID-NP) and included assessment of peri-traumatic reactions associated with the disaster, the frequency of other stressful events after the disaster, and standard PTSD rating scales at 6, 12, and 18 months.

RESULTS: Multivariate logistic regression of data on health care workers who cared for victims of the air disaster showed that PTSD was more likely to develop in those who had not completed college, those who had worked with burn victims, those who had experienced more stressful life events in a period of approximately six months following the disaster, and those who experienced emotional numbness immediately after the disaster.

CONCLUSIONS: These results suggest that lower levels of education, exposure to grotesque burn injuries, stressful life events following exposure, and feelings of numbness following exposure are useful predictors of subsequent development of PTSD.

Language: English

Keywords: Longitudinal study / Rescue workers / PTSD / Risk factors / Psychological distress

3.3 TRAIN ACCIDENTS

Selley C, King E, Peveler R, Osola K, Martin N, Thompson C.

Post-traumatic stress disorder symptoms and the Clapham rail accident.

British Journal of Psychiatry, 1997; 171: pp.478-482

Train collision, 1988, London, United Kingdom

OBJECTIVE: To study the prevalence and risk factors of posttraumatic symptoms following the train accident in south London in 1988, in which 35 people died and 500 were injured.

METHODS: Postal questionnaires were completed by 187 survivors (52% response rate) 10 to 22 months after the accident, and their symptoms were compared with a commuter control group (n = 101). Measures used were the Accident Inventory Questionnaire (AIQ), the Impact of Events Scale (IES), the Injury Severity Score (ISS) and the General Health Questionnaire (GHQ-28).

RESULTS: The accident group scored significantly higher on the Impact of Events scale. Severity of physical injury was significantly associated with high IES scores. Thirty percent of those moderately or severely injured showed high levels of intrusion or avoidance symptoms (sub-scores of 20 or more). Thirty percent of those nearest to the accident had high sub-scores, associated variables were the accident experience of risk of death, feeling trapped, and seeing death. For those less directly involved, the proportions with symptoms were similar to those of controls.

CONCLUSIONS: It is recommended that disaster services should provide for long-term psychological effects, particularly for those survivors who are injured, who experience risk of death, feeling trapped, or who witness death.

Language: English

Keywords: Control group comparison / Posttraumatic symptoms / Risk factors

3.4 SHIPPING DISASTERS

Dalgleish T, Joseph S, Yule W.

The Herald of Free Enterprise disaster: lessons from the first 6 years.

Behavior Modification, 2000; 24(5):pp.673-699

Sinking of the Herald of Free Enterprise, 1987, Zeebrugge, Belgium

OBJECTIVE: To review the research which had been carried out in the preceding 10 years among survivors of the Herald of Free Enterprise disaster. In this shipping disaster, many people were seriously injured and 193 passengers and crew members died.

METHODS: The research program of the Herald Research Team at the Institute of Psychiatry in London was involved in the assessment of survivors of this disaster at three time points: immediately after the disaster, about three years and about six years post-disaster. Their studies addressed the long term course of psychological problems and factors associated with the development of posttraumatic stress reactions. In this review the results of their studies are summarised.

RESULTS: The psychological effects of the disaster are considerable. Although the problems decrease over time, six years later a substantial minority was still highly distressed. Levels of crisis support early on seem to be protective. Individuals with negative attitudes towards emotional expression might be less likely to seek support. Those who perceived the causes of events as internal and controllable were at greatest risk for psychological disorders.

CONCLUSIONS: These data suggest that early interventions with respect to crisis support, attitudes to emotional expression and attribution style are important in preventing long-term distress.

Language: English

Keywords: Review / Longitudinal study / Posttraumatic symptoms / Depressed feeling / Anxiousness / Risk factors

Dooley E, Gunn J.

The psychological effects of disaster at sea.

British Journal of Psychiatry, 1995; 167(2): 233-237

Sinking of the Herald of Free Enterprise, 1987, Zeebrugge, Belgium

OBJECTIVE: To study the psychological effects of the Herald of Free Enterprise sinking as measured in a group of survivors.

METHODS: Seventy-five survivors and relatives were referred by their solicitors to the authors for assessment of psychological injury. Forty-seven (63%) were passengers and 28 (37%) were relatives or friends who had not been on the boat. Information was gathered retrospectively and systematically from clinical notes and legal reports. In addition, a symptom checklist with items relating to anxiety, phobic and depressive features was applied.

RESULTS: The most common symptoms reported were sleep disturbance, loss of concentration and increased anger. The most common diagnoses were posttraumatic stress disorder, other anxiety states and depression. Depressive symptoms were more common in those who suffered bereavement; anxiety symptoms were more common in those who did not suffer such loss. Reluctance to discuss symptoms or to attend a psychiatric clinic was a common feature.

CONCLUSIONS: As expected, bereavement led to grief and depressive symptoms, whereas passengers who were not bereaved were more likely to suffer from anxiety symptoms. Contrary to expectations, the degree of immersion during the accident did not influence the type or degree of symptoms. Women showed more affective symptoms and men more substance abuse.

Language: English

Keywords: Cross-sectional study / PTSD / Anxiety disorder / Depression / Substance abuse

Bolton D, O'Ryan D, Udwin O, Boyle S, Yule W.

The long-term psychological effects of a disaster experienced in adolescence: II: General psychopathology.

Journal of Child Psychology and Psychiatry, 2000; 41(4): pp.513-523

Jupiter cruise ship sinking, 1988, Pireaus, Greece

OBJECTIVE: To investigate the development and long-term course of general psychopathology among adolescents following the Jupiter shipping

disaster. A party of schoolchildren from the United Kingdom were on board the Jupiter when it sank. One schoolchild, one teacher and two rescuers died in this event.

METHODS: Young people (n = 216) who as teenagers had survived the Jupiter shipping disaster between five and eight years previously, and 87 matched controls were interviewed, using standardised diagnostic interviews, i.e. the Schedule for Affective Disorders and Schizophrenia Lifetime Version (SADS-L) and the Retrospective Experiences and Child and Adolescent Psychopathology (RECAP). Additional questions were used to retrospectively examine the time of onset and duration of any disorder.

RESULTS: The survivors showed raised rates of diagnosis in a range of anxiety and affective disorders during the follow-up period. For instance, 40% of the survivors had experienced an anxiety disorder and 34% had experienced a major depression since the disaster. Among controls, this was 18% and 17% respectively. The highest rates were found among the survivors who had developed posttraumatic stress disorder. The survivors without PTSD were generally similar to the controls. Onset of anxiety and affective disorders varied between being indefinitely close to the disaster to years later. Differences in rates of disorder between the survivor and control groups had lessened by the time of follow-up but were still apparent, due to continuing distress among the survivors still suffering from PTSD, and to a lesser extent among those who had recovered from PTSD.

CONCLUSIONS: These findings suggest that assessment and treatment of survivors of disasters should take into account not only PTSD but also other mental health problems.

Language: English

Keywords: Control group comparison / Adolescents / PTSD / Anxiety disorder / Depression / Substance abuse

Yule W, Bolton D, Udwin O, Boyle S, O'Ryan D, Nurrish J.

The long-term psychological effects of a disaster experienced in adolescence: I: The incidence and course of PTSD.

Journal of Child Psychology and Psychiatry, 2000; 41(4): pp.503-511
Jupiter cruise ship sinking, 1988, Pireaus, Greece

OBJECTIVE: To study the prevalence and long-term course of posttraumatic stress disorder in a group of young adults who as teenagers had survived the Jupiter shipping disaster between five and eight years previously.

METHODS: A standardised diagnostic interview was used, and survivors of the Jupiter disaster (n = 217) were compared with a control group of 87 young people. They were interviewed using the Clinician Administered PTSD Scale (CAPS).

RESULTS: Of the 217 survivors, 111 (51%) had developed PTSD at some time during the follow-up period, compared with an incidence in the control group of 3% (n = 3). In the large majority of PTSD cases among the survivors for whom time of onset was recorded (90%) onset was not delayed, occurring within six months of the disaster. About a third of those survivors who developed PTSD (30%) recovered within a year of onset, however another third (34%) was still suffering from the disorder at the time of follow-up, between five and eight years after the disaster.

CONCLUSIONS: These findings indicate that PTSD is a common consequence of disaster experience in adolescents, with poor long-term outcome in many cases.

Language: English

Keywords: Control group comparison / Adolescents / PTSD

Eriksson NG, Lundin T.

Early traumatic stress reactions among Swedish survivors of the m/s Estonia disaster.

British Journal of Psychiatry, 1996; 169(6): pp.713-716

Sinking of the m/s Estonia, 1994, Baltic Sea, Estonia

OBJECTIVE: To study the psychological impact of traumatic stress among survivors of the sinking of the M/S Estonia, in which 859 people died.

METHODS: The participants were 53 Swedish survivors who were studied three months after the event. A questionnaire consisting of questions about conditions during and after the disaster was distributed. Self-assessment of reactions was conducted using the Post Traumatic Symptom Scale (PTSS-10), Impact of Event Scale (IES), Sense of Coherence-short version (SoC-12), and the DSM-IV list of dissociative symptoms of Acute Stress Disorder.

RESULTS: The response rate was 79% (n = 42). The participants scored an average of 3.9 on PTSS-10, 28.5 on IES and 62.8 on SoC-12, which showed elevated levels of post-traumatic stress reactions but a normal level of sense of coherence. Based on the IES, 27 people (64%) scored above the cut-off value of 20. Emotional numbing was reported by 18 persons (43%), reduction of awareness by 23 people (55%), derealisation by 28 persons (67%), depersonalisation by 14 survivors (33%), and dissociative amnesia by 12 persons (29%). Survivors scoring low in sense of coherence scored

significantly higher in both PTSS-10 and IES than those with high scores in sense of coherence. All dissociative symptoms were predictive of post-traumatic reactions.

CONCLUSIONS: This study suggests the importance of assessing dissociative symptoms during a life-threatening event as a possible predictor for later post-traumatic reactions and possible PTSD. The Sense of Coherence Scale may be useful as an instrument to identify survivors at risk.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Risk factors

Lindeman M, Saari S, Verkasalo M, Prytz H.

Traumatic stress and its risk factors among peripheral victims of the M/S Estonia Disaster.

European Psychologist, 1996; 1(4): pp.255-270

Sinking of the M/S Estonia, 1994, Baltic Sea, Estonia

OBJECTIVE: To study short- and long-term traumatic stress reactions and related risk factors among peripheral victims of the Estonia disaster.

METHODS: Participants were 135 crew members (50 males and 85 females) of one of the Finnish ferries that took part in the rescue operation. Of these, 69 were crew that were on board during the disaster night and 66 that were not. The participants retrospectively filled in a questionnaire including items on stress symptoms one week, one month, and eight months after the disaster.

RESULTS: A factor analysis produced three symptom types: general traumatic stress symptoms, fear, and somatic symptoms. Symptoms decreased over time. Behavioural changes, changes in world view, and the impact of several risk factors (e.g., past traumas, avoidance behaviour, appraisal of symptoms, social support) were analysed. The variable that most consistently predicted distress was avoidance behaviour.

CONCLUSIONS: Results indicate that fourth-level disaster victims (on-site crew) and sixth-level victims (not on-board crew) suffer from traumatic stress at least as much as third-level victims (professional helpers), that women experience more psychological problems than men, and that different symptom types progress in different ways and stem from different risk factors.

Language: English

Keywords: Cross-sectional study / Rescue workers / Psychological distress / Anxiousness / MUPS / Risk factors

3.5 OIL DISASTERS

Arata CM, Picou JS, Johnson GD, McNally TS.

Coping with technological disaster: an application of the conservation of resources model to the Exxon Valdez oil spill.

Journal of Traumatic Stress, 2000; 13(1): pp.23-39

Exxon Valdez accident with oil spill, 1989, Cordova, Alaska, United States

OBJECTIVE: To study the chronic mental health effects in survivors of the Exxon Valdez accident, the largest oil spill in North American history with long lasting ecological and economic impact.

METHODS: One hundred and twenty-five commercial fishers in Cordova, Alaska, completed a mailed survey regarding current mental health functioning six years after the Exxon Valdez oil spill. Economic and social impacts of the oil spill, coping and psychological functioning (modified Coping Strategies Scales - COSTS, and SCL-90-R) were measured. Multiple regression was used to test the utility of the Conservation of Resources stress (COR)- model for explaining observed psychological symptoms.

RESULTS: Current symptoms of depression, anxiety, and posttraumatic stress disorder were associated with conditions of resource loss and avoidant coping strategies.

CONCLUSIONS: The COR-model provided a framework for explaining psychological impacts of the oil spill. Future research is needed to identify factors related to recovery.

Language: English

Keywords: Cross-sectional study / Depressed feeling / Anxiousness / Posttraumatic symptoms / Coping

Palinkas LA, Petterson JS, Russell J, Downs MA.

Community patterns of psychiatric disorders after the Exxon Valdez oil spill.

American Journal of Psychiatry, 1993; 150(10): pp.1517-1523

Exxon Valdez accident with oil spill, 1989, Cordova, Alaska, United States

OBJECTIVE: To study the prevalence of generalised anxiety disorder, posttraumatic stress disorder (PTSD), and depressive symptoms in residents

of 13 communities affected by the clean-up efforts of the Exxon Valdez accident.

METHODS: Approximately one year after the event, 437 adults living in affected communities participated in this study. A sample of 162 adults from non-affected communities served as controls. Questions from the National Institute of Mental Health Diagnostic Interview Schedule (DIS) were used to assess symptoms of generalised anxiety disorder and PTSD. The Center for Epidemiologic Studies Depression (CES-D) Scale was used to assess levels of depressive symptoms.

RESULTS: The prevalence of generalised anxiety disorder for the exposed communities was about 20%; for PTSD the prevalence was about 9%. The prevalence of respondents with CES-D Scale scores above 16 and 18 was 16.6% and 14.2%, respectively. When compared with the unexposed group, members of the high-exposure group were 3.6 times as likely to have generalised anxiety disorder, 2.9 times as likely to have PTSD, 1.8 times as likely to have a CES-D Scale score of 16 and above, and 2.1 times as likely to have a CES-D Scale score of 18 and above. Women exposed to this event were particularly vulnerable to these conditions, and Alaska Natives were particularly vulnerable to depressive symptoms after the oil spill.

CONCLUSIONS: The results show that the impact of the Exxon Valdez accident on psychological health was considerable and that there are a number of implications for mental health needs, particularly in primary care settings.

Language: English

Keywords: Control group comparison / Anxiety disorder / PTSD / Depressed feeling

Alexander DA, Wells A.

Reactions of police officers to body-handling after a major disaster: a before-and-after comparison.

British Journal of Psychiatry, 1991; 159: pp.547-555

Piper Alpha oil platform disaster, 1988, Northeast of Aberdeen, United Kingdom

OBJECTIVE: To study the emotional and physical reactions of police officers who had been involved in body-handling duties following the Piper Alpha disaster. In this event, 167 people died. Several months afterwards, 105 bodies were still missing.

METHODS: The participants were 18 officers who had been involved at the Orkney island Flotta, 30 mortuary officers and 42 officers who had not been

involved in any disaster duties and hence served as controls. Data from pre-disaster assessments were available for the Hospital Anxiety and Depression Scale (HAD) and the Eysenck Personality Questionnaire (EPQ). Three months after the disaster duties had been completed, the following measures were used: Revised Impact of Event Scale (IES-R), Flotta/Mortuary Questionnaire and a coping strategy scale.

RESULTS: The comparisons failed to demonstrate high levels of posttraumatic distress or psychiatric morbidity.

CONCLUSIONS: The results are interpreted in terms of issues such as the officers' own coping strategies, and major organisational and managerial factors.

Language: English

Keywords: Pre-post comparison / Control group comparison / Rescue workers / Posttraumatic symptoms / Anxiousness / Depressed feeling / Coping

Hull AM, Alexander DA, Klein S.

Survivors of the Piper Alpha oil platform disaster: long-term follow-up study.

British Journal of Psychiatry, 2002; 181: pp.433-438

Piper Alpha oil platform disaster, 1988, Northeast of Aberdeen, United Kingdom

OBJECTIVE: To study the long-term psychological effects and the role of related factors in survivors of the Piper Alpha oil platform disaster.

METHODS: Ten years after the disaster, 78% (46/59) of the survivors were located, of whom 72% (33/46) agreed to be interviewed. A semi-structured interview was conducted and the following self-report measures were used: Impact of Event Scale – Revised (IES-R), Post-Traumatic Symptom Scale (PTSS-12), General Health Questionnaire (GHQ) and Hopelessness Scale.

RESULTS: The most stringent diagnostic criteria for posttraumatic stress disorder were met by 21% (7/33) of the survivors 10 years after the disaster. Characteristics such as physical injury, personal experience and survivor guilt were significantly associated with higher levels of posttraumatic symptoms.

CONCLUSIONS: A narrow definition of factors affecting outcome will limit the potential for improving survivor well-being in the long term after major disasters. Specific symptoms that are not included in the criteria for the diagnosis of PTSD, together with issues such as re-employment, need to be addressed.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Psychological distress / Risk factors

Holen A.

A longitudinal study of the occurrence and persistence of post-traumatic health problems in disaster survivors.

Stress Medicine, 1991; 7(1): pp.11-17

'Alexander L. Kielland' oil rig disaster, 1980, North Sea, Ekofisk field between United Kingdom and Norway

OBJECTIVE: To study the health effects in survivors of the 'Alexander L. Kielland' disaster, in which 123 people died.

METHODS: The insurance records of workers (n = 73) surviving the disaster were studied longitudinally. The figures were compared with a group (n = 89) of offshore oil workers not exposed to disaster and matched for age and gender. The observation period lasted from the disaster in 1980 through the first six months of 1988.

RESULTS: Baseline data from the two years pre-disaster showed no significant differences between the populations. However, among the survivors a significant increase in general morbidity appeared during the aftermath of the disaster with regard to both occurrence and persistence. When diagnoses were divided into 'psychiatric' and 'non-psychiatric' the most striking changes were found for the psychiatric diagnoses. More moderate, yet significant differences emerged for the non-psychiatric diagnoses. Of these, the psychosomatic diagnoses tended to show significant differences between groups while the group of general somatic diagnoses did not. Indications of an increased accident proneness in the survivors were also present. Occurrence rates and the level of persistence remained fairly stable throughout the observation period; no obvious decline over the years was found.

CONCLUSIONS: These findings emphasize the need for appropriate programmes to help the victims of catastrophic stress aiming at the reduction of the occurrence and persistence of psychiatric and non-psychiatric health problems.

Language: English

Keywords: Longitudinal study / Control group comparison / Mental disorders / Symptoms

3.6 EXPLOSIONS, FIRES AND COLLAPSES

Drogendijk AN, Velden PG van der, Kleber RJ, Christiaanse BBA, Dorresteyn SM, Grievink L, Gersons BPM, Olf M, Meewisse ML.
Turkse getroffen en vuurwerkkramp Enschede: een vergelijkende studie.
(Turkish victims of the Enschede firework disaster: a comparative study.)
Gedrag & Gezondheid, 2003; 31(3): pp.145-162
Explosion firework depot, 2000, Enschede, The Netherlands

OBJECTIVE: To study the after-effects of a firework explosion which took place in an area in which many inhabitants were Turkish immigrants. Due to this explosion, more than 500 houses were damaged or destroyed. Twenty-two people died, and many were injured.

METHODS: Eighteen months after the disaster a sample of Turkish residents was compared with a control group and (indirectly) with other affected residents. Various symptoms of distress, posttraumatic stress symptoms and the use of physicians and mental health care organisations were studied. Measures used were the SCL-90 and a Dutch version of the Impact of Event Scale (IES).

RESULTS: The findings indicate that 18 months after the disaster about 75% of the Turkish respondents suffer from various severe mental health symptoms, like anxiety and depression. Seventy percent of the Turkish respondents have severe posttraumatic symptoms such as re-experiencing the disaster and avoidance. Approximately half of the respondents visited the mental health care organisations (the past 12 months). However, only a quarter of the respondents had five or more treatment sessions. The results were compared with a control group of Turkish immigrants. Significantly more Turkish victims had mental health symptoms and visited the mental health care in comparison with the control group. Furthermore, a larger difference in psychological symptoms was found between the Turkish victims and the Turkish control group in comparison with the differences in symptoms between the indigenous Dutch victims and the indigenous Dutch control group.

CONCLUSIONS: These findings indicate that the psychological impact of the disaster was more extensive for Turkish victims than for indigenous victims.

Language: Dutch

Keywords: Control group comparison / Immigrants / Posttraumatic symptoms / Anxiousness / Depressed feeling / Psychological distress / Health services utilisation

Reijneveld SA, Crone MR, Verhulst FC, Verloove-Vanhorick SP.

The effect of a severe disaster on the mental health of adolescents: a controlled study.

Lancet, 2003; 362(9385): pp.691-696

Also published in:

Reijneveld SA, Crone MR, Verhulst FC, Verloove-Vanhorick SP.

Psychische gezondheid van 13-14-jarigen voor en na de cafébrand: een prospectief onderzoek met gegevens van de getroffen en van een controlepopulatie.

(Mental health of 13- and 14-year-old children before and after the café fire in Volendam, the Netherlands: a prospective study with data from the victims and a control population.)

Nederlands Tijdschrift voor Geneeskunde, 2003; 147(37): pp.1785-1792.

Fire in cafe, 2001, Volendam, The Netherlands

OBJECTIVE: To assess the effects of a café fire on mental health and substance use of surviving adolescents. In this event, 14 adolescents were killed and 250 injured.

METHODS: In the 15 months before the disaster, all grade two students (aged 12-15 years) from a school in Volendam (of whom 31 were in the café during the fire), and from two other schools, had been selected as controls for a study. One hundred and twenty-four Volendam students and 830 from the other two schools had provided data for substance use, and completed the youth self-report (YSR) questionnaire about behavioural and emotional problems. Five months after the disaster, follow-up data were obtained from 91 (response rate 73%) Volendam adolescents and 643 (77%) controls from the other two schools. The primary outcome measures were changes in score in YSR categories, e.g. total problems, alcohol misuse, smoking, and substance use. Changes in scores were compared between groups using logistic regression.

RESULTS: Volendam adolescents had larger increases in clinical scores than controls for total problems (OR 1.82) and excessive use of alcohol (OR 4.57), but not for smoking or use of marijuana, MDMA (ecstasy), and sedatives. Increases in YSR scores were largest for being anxious or depressed (OR 2.85), incoherent thinking (odds ratio 2.16), and aggressive

behaviour (OR 3.30). Intention-to-treat analyses showed significantly larger increases in rates of excessive drinking and YSR symptom subscales in Volendam adolescents than controls. Effects were mostly similar in victims and their classmates.

CONCLUSIONS: Mental health interventions after disasters should address anxiety, depression, thought problems, aggression, and alcohol abuse of directly affected adolescents and their peer group.

Language: English

Keywords: Pre-post comparison / Control group comparison / Adolescents / Substance abuse / Anxiousness/ Depressed feeling / Behaviour problems

Fogarty PW, George PJ, Solomon M, Spiro SG, Armstrong RF.

Long term effects of smoke inhalation in survivors of the King's Cross underground station fire.

Thorax, 1991; 46(12): pp.914-918

Fire underground station King's Cross, 1987, London, United Kingdom

OBJECTIVE: To assess the long-term effects of smoke inhalation in victims of the fire at King's Cross station, in which 31 people died and 56 were injured.

METHODS: Fourteen survivors from the King's Cross underground station fire were assessed for respiratory disability six months after the disaster and 10 were reassessed at two years. All had inhaled substantial quantities of smoke and 10 had skin burns of differing severity.

RESULTS: Six months after the fire nine survivors reported one or more symptoms, which included hoarseness (two cases), cough (five cases), and breathlessness (six cases); and a survivor with asthma noted a worsening of his symptoms. The remaining five did not experience new symptoms. Ventilatory defects, like small airways obstruction, were present in 11 survivors at six months and they had persisted in the seven patients who were reassessed at two years.

CONCLUSIONS: Smoke inhalation may lead to more damage to the small airways than had previously been recognised.

Language: English

Keywords: Longitudinal study / Respiratory symptoms / Symptoms

Turner SW, Thompson J, Rosser RM.

The Kings Cross fire: psychological reactions.

Journal of Traumatic Stress, 1995; 8(3): pp.419-427
Fire underground station King's Cross, 1987, London, United Kingdom

OBJECTIVE: To describe the psychological reactions in survivors of the King's Cross fire.

METHODS: A sample of 50 survivors participated in this study. Interviews took place between one and 12 months after the fire. The instruments used were the Impact of Event scale (IES), the General Health Questionnaire (GHQ-28), the Eysenck Personality Questionnaire (EPQ) and a King's Cross Event Schedule. These were investigated in relation to (a) validity measures, (b) relationships between exposure and personality, and (c) spontaneous debriefing.

RESULTS: Two thirds of the sample had significant levels of psychological distress (meeting the "caseness" criterion on the GHQ). Both personality (neuroticism and L-scale) and degree of trauma exposure were related to subsequent reaction. Spontaneous debriefing was associated with subjective benefit.

CONCLUSIONS: These results indicate that transportation disasters present particular problems in relation to research and service delivery.

Language: English

Keywords: Cross-sectional study / Psychological distress / Posttraumatic symptoms

March JS, Amaya-Jackson L, Terry R, Costanzo P.
Posttraumatic symptomatology in children and adolescents after an industrial fire.
Journal of the American Academy of Child and Adolescent Psychiatry, 1997; 36(8): pp.1080-1088
Fire Imperial Foods chicken-processing Plant, 1991, North Carolina, United States

OBJECTIVE: To evaluate the extent and nature of posttraumatic symptomatology (PTS) in children and adolescents nine months after an industrial fire in which 25 people were killed and 56 seriously injured.

METHODS: A sample of 1,019 fourth- to ninth-grade students living in the community where the fire occurred was surveyed, using a self-report measure of PTSD plus self- and teacher reports of comorbid symptoms.

RESULTS: Three factors comprising posttraumatic symptoms were identified: re-experiencing, avoidance and hyper-arousal. Re-experiencing and avoidance were positively correlated; hyper-arousal proved weakly

correlated with re-experiencing, perhaps because exposure was largely indirect. Using a T score cut-off of 65 on the re-experiencing factor as indicative of PTS, 10% of the subjects met criteria for PTS; 12 % met criteria for posttraumatic stress disorder (PTSD) using DSM-III-R PTSD criteria. Degree of exposure was the most powerful predictor of PTS. Race (African-American) and gender (female) were significant risk factors for PTS. Self-reported internalising symptoms and teacher-reported externalising symptoms were positively predicted by intercurrent PTS, and independently of PTS, by degree of exposure. Comorbid symptoms showed interesting interactions with exposure, race, and gender. Lack of self-attributed personal efficacy predicted PTS but did not moderate the effects of race or gender on PTS risk.

CONCLUSIONS: This study, which used a population-based sampling strategy, strengthens and extends findings from earlier literature on paediatric PTSD in showing that (1) PTS and comorbid internalising and externalising symptoms rise in direct proportion to degree of exposure; (2) gender and race show variable effects on risk for PTS and comorbid symptoms; and (3) comorbid symptoms are positively correlated with PTS and may represent primary outcomes of traumatic exposure in their own right.

Language: English

Keywords: Cross-sectional study / Children / Adolescents / Posttraumatic symptoms / Depressed feeling / Anxiousness / Behaviour problems

Terr LC, Bloch DA, Michel BA, Shi H, Reinhardt JA, Metayer S.

Children's symptoms in the wake of Challenger: a field study of distant-traumatic effects and an outline of related conditions.

American Journal of Psychiatry, 1999;156(10): pp.1536-1544

Explosion of the Challenger space shuttle, 1986, Cape Canaveral, United States

OBJECTIVE: To study posttraumatic symptoms and bereavement in children and adolescents after a distant, horrifying event, namely the explosion of the Challenger space shuttle, in which all seven crew members, including a New Hampshire school teacher, died. The Challenger space shuttle launch was watched live on television by millions of American schoolchildren.

METHODS: A structured interview was conducted to assess symptoms in 153 children and adolescents. Responses were compared between East Coast children, who generally cared more about the teacher aboard the Challenger,

and West Coast children, who heard about it first. The interviews were conducted at two time points: within the first five to seven weeks after the explosion and 14 months later.

RESULTS: More than 60% of the subjects feared at least one stimulus related to Challenger within the first five to seven weeks of the explosion. The East Coast group and children appeared significantly more symptomatic than did the West Coast and adolescent groups. Over the 14-month study period, most symptoms faded dramatically. However, adolescents' diminished expectations for the future in general increased, and children's changed approach to space careers held relatively steady. Three East Coast children met the DSM-III-R symptom requirements for PTSD in 1986; no children met these in 1987.

CONCLUSIONS: Children's symptomatic patterns after Challenger relate to the patterns for PTSD listed in diagnostic manuals and to three symptoms not in the DSM-IV list. Distant traumas seem to be one of a newly defined spectrum of trauma-related conditions that include relatively evanescent symptoms and a few longer-lasting ones. These symptoms may affect large numbers of normal children.

Language: English

Keywords: Longitudinal study / Children / Adolescents / Posttraumatic symptoms

Vila G, Witkowski P, Tondini MC, Perez-Diaz F, Mouren-Simeoni MC, Jouvent R.

A study of posttraumatic disorders in children who experienced an industrial disaster in the Briey region.

European Child & Adolescent Psychiatry, 2001; 10(1): pp.10-18

Mine collapse, 1996, Auboué, France

OBJECTIVE: To study posttraumatic symptoms in children who were involved in a mine collapse, and to assess the mediating influence of exposure, parental symptoms and socio-demographic variables on the children's symptoms. The event involved sudden and repeated land movements, which caused buildings to crack leading to the evacuation of the population.

METHODS: Six months after the event, 43 exposed children (i.e. who experienced an emergency evacuation before the collapse of their houses) were compared with 44 threatened children (i.e. from non-evacuated risk areas), and with a control group of 50 unexposed children from a nearby community. The children were assessed with the following self-administered

questionnaires: The State and Trait Anxiety Inventory for Children (STAIC), the Impact of Event Scale (IES) and the Child Depression Inventory (CDI). Parents filled in the Conners Parent Rating Scale (CPRS), the Child Behaviour Checklist (CBCL) and the General Health Questionnaire (GHQ-28).

RESULTS: The exposed group obtained significantly higher anxiety and trauma-related scores than both the control group and the indirectly exposed group, as well as higher scores of behavioural symptoms and of parental symptoms. Indirectly exposed children did not have higher rates of symptoms than control children. The younger exposed children exhibited the highest psychopathological scores. Low socio-economic status was associated with more symptomatology. There were no differences on questionnaire scores between girls and boys. Children's symptoms correlated with disorders in both parents; but this only accounted for part of the variance, a finding which supports the hypothesis of a direct impact of the trauma on the child, irrespective of parental clinical status, SES of the family, children's age and gender.

CONCLUSIONS: Children's and parent's symptoms interact in a complex fashion which needs further study.

Language: English

Keywords: Control group comparison / Children / Parents / Posttraumatic symptoms / Psychological distress / Depressed feeling / Anxiousness / Behaviour problems / Risk factors

Morgan L, Scourfield J, Williams D, Jasper A, Lewis G.

The Aberfan disaster: 33-year follow-up of survivors.

British Journal of Psychiatry, 2003; 182: pp.532-536

Mine collapse, 1966, Aberfan, Wales, United Kingdom

OBJECTIVE: To examine the long-term psychological effects, after more than 30 years, of surviving the 1966 Aberfan disaster in childhood. In this event, a coal slug heap collapsed onto a primary school, killing 116 children.

METHODS: Survivors (n = 41) were compared with controls (n = 72) matched for age and background. All were interviewed using the Composite International Diagnostic Interview (CIDI), measures of current health and social satisfaction, and the General Health Questionnaire (GHQ). The survivor group also completed the Impact of Event Scale (IES) to assess current levels of PTSD.

RESULTS: Nineteen survivors (46%) had had PTSD at some point since the disaster, compared with 12 controls (20%). Twelve survivors (29%) met

diagnostic criteria for current PTSD. Survivors were not at a significantly increased risk of anxiety, depression or substance misuse.

CONCLUSIONS: Trauma in childhood can lead to PTSD, and PTSD symptoms can persist for as long as 33 years into adult life. Rates of other psychopathological disorders are not necessarily raised after life-threatening childhood trauma.

Language: English

Keywords: Cross-sectional study / PTSD / Anxiety disorder / Depression / Substance abuse

Breton JJ, Valla JP, Lambert J.

Industrial disaster and mental health of children and their parents.

Journal of the American Academy of Child and Adolescent Psychiatry, 1993; 32(2): pp.438-445

Fire in PCB Warehouse, 1988, Montreal, Canada

OBJECTIVE: To study the mental health among children exposed to an industrial disaster. In 1988, a fire was deliberately set in a PCB warehouse. As a result of the fire more than 1,600 families were evacuated. The first objective of this study was to determine whether 6-11 year old children would present more mental health problems than 3-5 year olds. The second objective was to study the correlation between children's symptoms and parents' mental health. The third objective was to examine whether parents were able to accurately estimate their child's reactions.

METHOD: Eighty-seven children from exposed families and 87 controls were assessed one year after the event. Structured questionnaires were administered to the children and their parents during home visits. The Behavior Screening Questionnaire (BSQ) was used to assess the younger children, whereas the Kiddie-Schedule for Affective Disorders and Schizophrenia (k-SADS-E) was used for the 6-11 year olds. The Diagnostic Interview Schedule Self-Administered (DISSA), the Psychiatric Symptom Index, the Dyadic Adjustment Scale and the Impact of Event Scale (IES) were used to examine health problems of the parents.

RESULTS: There was no significant difference in behavioural problems between the exposed and control children aged 3-5 years. No significant differences were found in mental health between the exposed and control parents of these younger children. With respect to the 6-11 year old children, significant differences were found between the exposed and controls for internalised diagnoses, like depression and anxiety disorders. Significant differences were also found for posttraumatic symptoms. Fathers' mental

health as well as mothers' mental health was positively correlated with the children's symptoms.

CONCLUSIONS: These results show that exposed children aged 6-11 years displayed more overall internalised and posttraumatic symptoms than did those in the control group and also more than the younger children. The mental health of parents correlated with children's symptoms and parents were able to accurately observe their child's reaction to a disaster.

Language: English

Keywords: Control group comparison / Children / Parents / Posttraumatic symptoms / Depression / Anxiety disorder / Behaviour problems

Farhood LF, Nouredine SN.

PTSD, depression, and health status in Lebanese civilians exposed to a church explosion.

International Journal of Psychiatry in Medicine, 2003; 33(1): pp.39-53.

Church explosion, 1994, Beirut, Lebanon

OBJECTIVE: To examine the effect of stressors on PTSD, depression, and health status in a sample of Lebanese civilians exposed to a church explosion and a comparison group one year after the event. In this event 9 people were killed and 42 injured.

METHODS: Interviews were conducted with 33 victims and 30 family members. Moreover, 30 neighbours were chosen to form a control group. The main outcome measures were the Clinician Administered PTSD Scale Version I (CAPS-1), Beck Depression Inventory (BDI), and change in health service utilisation in the past year. Multivariate analysis was done using logistic regression to predict the study outcomes.

RESULTS: PTSD was present in 17% of the total sample, depression in 42% and the mean increase in doctors' visits was 2.05 +/- 2.97. In the victims' group, 39% met PTSD diagnostic criteria, 51% were depressed, and 45% reported deterioration in their health status. These rates were significantly higher than those in the control group. Also, females were 2.62 times more at risk than males for depression. Victims were 7.35 times and those with financial problems 2.67 times more at risk of having increased doctor's visits than their family or neighbour comparison group.

CONCLUSIONS: The results suggest that PTSD, depression, and health status deterioration in trauma victims may persist over time. Resources such as social support can help attenuate the symptoms of those at a higher risk.

Language: English

Keywords: Control group comparison / PTSD / Depression / Health status / Health services utilisation

Dyregrov A, Frykholm AM, Lilled L, Broberg AG, Holmberg I.

The Göteborg discotheque fire, 1998.

Scandinavian Journal of Psychology, 2003; 44(5): pp.449-457

Discotheque fire, 1998, Göteborg, Sweden

OBJECTIVE: To study the psychological effects, i.e. posttraumatic stress reactions and depression, in adolescents after the discotheque fire in Göteborg. Sixty-three people were killed and 213 injured in this tragic event.

METHODS: A group of 563 adolescents answered a questionnaire seven months following the disaster. The questionnaire included the Impact of Event Scale (IES) and the Birlerson Depression Self-Rating Scale (DSRS).

RESULTS: The level of trauma was found to be very high, while depression scores were less elevated. A little under a third of the students scored above a clinical cut-off point (> 35) on the IES, indicating high posttraumatic stress levels. Girls evidenced more depression and traumatic stress reactions than boys. Levels of reactions increased with more closeness (knowing victims personally) and if the adolescents were of non-Swedish origin.

CONCLUSIONS: In view of the fact that many of the participants in this study did not personally know anyone who died or survived the fire, the level of depression and traumatic stress is surprisingly high. It seems evident that a disaster of this size in some ways affects all young people.

Language: English

Keywords: Cross-sectional study / Adolescents / Posttraumatic symptoms / Depressed feeling

Renck B, Weisaeth L, Skarbo S.

Stress reactions in police officers after a disaster rescue operation.

Nordic Journal of Psychiatry, 2002; 56(1): pp.7-14

Discotheque fire, 1998, Göteborg, Sweden

OBJECTIVE: To assess the prevalence of posttraumatic symptoms and to study subjective well-being, general distress, and social functioning among police officers 18 months after a rescue operation during the Göteborg discotheque fire.

METHODS: Forty-one police officers participated. They completed the following self-report measures: Posttraumatic Symptom Scale (PTSS-10), Impact of Event Scale-Revised (IES-R) and General Health Questionnaire (GHQ-28).

RESULTS: On the IES-R, one police officer had an intrusion and avoidances score greater than 20, suggesting a stress reaction of clinical significance. When compared with the PTSS-10 scale, two officers (5%) showed a high level of psychological distress. Measured with the GHQ-28, three officers (7%) still had a high level of psychological distress. On one of the four different subscales most of the officers show various degrees of reduced social functioning.

CONCLUSIONS: This study shows that police officers were not immune to rescue operations. Eighteen months after the rescue operation a few police officers were still under stress.

Language: English

Keywords: Cross-sectional study / Rescue workers / Posttraumatic symptoms / Psychological distress

3.7 NUCLEAR DISASTERS

Bromet EJ, Gluzman S, Schwartz JE, Goldgaber D.

Somatic symptoms in women 11 years after the Chernobyl accident: prevalence and risk factors.

Environmental Health Perspectives, 2002; 110(Suppl 4): pp.625-629
Chernobyl nuclear accident, 1986, Chernobyl, former Soviet Union

OBJECTIVE: To gain insight into the nature and risk factors for persistent somatic complaints after exposure to the Chernobyl nuclear power plant explosion. In this event, 120,000 people had to be evacuated. Pregnant women were advised to have abortions without being given a clear explanation, and the evacuation process was chaotic.

METHODS: This study compared the health reports of 300 women and their children evacuated to Kiev from the contamination zone around the plant and 300 controls. The interview addressed somatic concerns, risk factors for poor health, and Chernobyl-related stress. Moreover, the SCL-90 and the Impact of Event Scale (IES) were used.

RESULTS: Compared with controls, evacuees reported significantly more health problems and rated their health more poorly overall. These differences remained significant after controlling for demographic and clinical risk factors, including the tendency to amplify physical symptoms. Significantly more evacuees received a diagnosis of a Chernobyl-related illness by a local physician, believed that their health and their children's health had been adversely affected, and reported posttraumatic symptoms. After controlling for these Chernobyl stress variables, the differences in number of health problems commonly attributed to Chernobyl remained significant but differences in general health ratings did not. The perceptions of controls were similar to those of women in a national sample. The relationship between Chernobyl stress and illness was twice as strong in evacuees as in Kiev controls and weakest in the national sample.

CONCLUSIONS: These results confirm the persistence and non-specificity of the subjective medical consequences of Chernobyl and are consistent with the hypothesis that traumatic events exert their greatest negative impacts on health in vulnerable or disadvantaged groups.

Language: English

Keywords: Control group comparison / Women / Posttraumatic symptoms / Psychological distress / Health status / Risk factors

Bromet EJ, Goldgaber D, Carlson G, Panina N, Golovakha E, Gluzman SF, Gilbert T, Gluzman D, Lyubsky S, Schwartz JE.

Children's well-being 11 years after the Chernobyl catastrophe.

Archives of General Psychiatry, 2000; 57(6): pp.563-571

Chernobyl nuclear accident, 1986, Chernobyl, former Soviet Union

OBJECTIVE: To assess the psychological effects of the 1986 Chernobyl disaster in children evacuated to Kiev from the contaminated zone surrounding the nuclear power facility.

METHODS: In 1997, three hundred 10- to 12-year-old children in Kiev were evaluated, who were in utero or infants at the time of the disaster and who had resided near Chernobyl (evacuees). A control group consisted of 300 sex-matched classmates who had never lived in a radiation-contaminated area. Response rates were 92% (evacuees) and 85% (classmates). Data were obtained from children, mothers, and teachers using standard measures of well-being and risk factors for childhood psychopathology. Children's self-report measures used were the Children's Manifest Anxiety Scale, Depression Self-Rating Scale, Fear Inventory, Children's Somatization Inventory (CSI), the short form of the Perceived Competence Scale for Children, and the Children's Chernobyl Anxiety Scale. Maternal report of child's well-being was assessed using the Russian adaptation of the Child Behavior Checklist (CBCL) and mothers' ratings on the CSI. Teacher reports were assessed using the Iowa Conners' Teaching Rating Scale. Maternal Chernobyl-related stress was assessed with the Chernobyl Health Stress Scale and the Impact of Events Scale – Revised (IES-R). The children also received physical examinations and basic blood tests.

RESULTS: The evacuees and classmates perceived their mental health similarly except for Chernobyl-related anxiety symptoms and perceived scholastic competence. No differences were found on the Iowa Conners' Teacher Rating Scale. Although the physical examination and blood test results were normal, the evacuee mothers rated their children's well-being as significantly worse, especially with respect to somatic symptoms on the Children's Somatization Inventory and Child Behavior Checklist. The most important risk factors for these ratings were maternal somatisation and Chernobyl-related stress.

CONCLUSIONS: Given the multiple stressful experiences to which evacuated families were exposed, the small differences in the children's self-reports suggest that there are protective factors in the lives of these children. The trauma experienced by the mothers was reflected in their perceptions of their children's well-being, particularly somatic symptoms, but was not transmitted to the children themselves.

Language: English

Keywords: Control group comparison / Children / Anxiousness / Depressed feeling / Psychological distress / Symptoms

Havenaar JM, Savelkoul TJF, Bout J van den, Bootsma PA, Brink W van den.

Consequences of the Chernobyl disaster: Illness or illness behaviour?

Gedrag & Gezondheid, 1999; 27(1-2): pp. 84-90

Chernobyl nuclear accident, 1986, Chernobyl, former Soviet Union

OBJECTIVE: To investigate the long-term psychosocial consequences of the Chernobyl nuclear disaster in 1986.

METHODS: Two field studies were conducted in two regions of the former Soviet Union. The first study took place in the Gomel region (Republic of Belarus) in the direct vicinity of the damaged nuclear plant. A control study was conducted in the Tver region (Russian Federation), a region not significantly contaminated by fall-out from Chernobyl. In phase one, 3,084 subjects completed a self-report questionnaire assessing psychological well-being (assessed with the General Health Questionnaire, GHQ), subjective health (measured with the Medical Outcomes Study questionnaire, Short Form, MOS-SF) and health-related behaviours. In phase two, 449 subjects completed a comprehensive physical and psychiatric examination.

RESULTS: Significantly higher levels of psychological distress, poorer subjective health, and higher medical consumption were found in the exposed subjects. No significant differences in overall levels of psychiatric or physical morbidity were found between exposed and non-exposed subjects, including radiation-related diseases.

CONCLUSIONS: These results indicate that psychological distress following the Chernobyl disaster had a marked effect on psychological well-being and perceived health, and on subsequent illness behaviours.

Language: English

Keywords: Control group comparison / Psychological distress / Mental disorders / Health status / Health services utilisation

Lomat L, Galburt G, Quastel MR, Polyakov S, Okeanov A, Rozin S.

Incidence of childhood disease in Belarus associated with the Chernobyl accident.

Environmental Health Perspectives, 1997; 105(Suppl 6): pp.1529-1532

Chernobyl nuclear accident, 1986, Chernobyl, former Soviet Union

OBJECTIVE: To study the childhood incidence of cancer and other diseases in Belarus, an important issue because of the radiation as a result of the Chernobyl accident, to which about 20 % of the children in the republic were exposed.

METHODS: In the Republic of Belarus the State Registry of Population Exposed to Radiation as a Result of the Chernobyl Accident (Chernobyl registry) was initiated in 1986. The registry was created to study time trends and diseases outcomes in follow-up populations, to define risk groups and to assess the effectiveness of rehabilitation procedures and to prepare recommendations on prevention, diagnosis and treatment.

RESULTS: Since 1987 increases in the incidence of most disease categories have been reported, including the development of thyroid cancer. From 1987 to 1995, thyroid cancer was diagnosed in 424 children; its incidence having increased from 0.2 to 4.0/10(5) in 1995. According to preliminary data for 1996, 81 childhood cancer cases were reported. During 1995 there also were increases in the incidence of endocrine and dermatological diseases and mental disorders. During the period 1987 to 1995 significant increases in the incidences of all illnesses were observed for children listed in the Chernobyl registry. The highest incidence rates were found in evacuated children and those residing in contaminated areas. There also were increased incidences of thyroid and digestive organ diseases among these children and in addition, a high prevalence of chronic tonsillitis and adenoiditis was observed. Since 1990 an increase in autoimmune thyroiditis has been observed. The highest rates of haematopoietic tissue diseases were found in children born after the accident to irradiated parents.

CONCLUSIONS: These results show elevated morbidity in several disease categories. This can partly be ascribed to radiation. However, the roles of improved surveillance and psychosocial aspects as well as adverse nutritional and other environmental factors should also be evaluated.

Language: English

Keywords: Longitudinal study / Children / Cancer

Rytömaa T.

Ten years after Chernobyl.

Annals of Medicine, 1996; 28(2): pp.83-87

Chernobyl nuclear accident, 1986, Chernobyl, former Soviet Union

OBJECTIVE: To give an overview of studies on the health consequences of the accident at the Chernobyl nuclear power plant in 1986.

METHODS: The way in which the literature is searched is not mentioned.

RESULTS: Acute radiation damage caused by exposure to high doses of ionizing radiation involved a few hundred people, apparently with fewer than 100 deaths within the first few months. Epidemiologically detectable increases in congenital abnormalities have not been reported thus far, with the possible exception of Down's syndrome.

CONCLUSIONS: Owing to the long latency period of radiation-induced cancer, discernible increases in cancer incidence and mortality are not yet expected for most tumour types, especially among adults. However, dramatic increases in the number of childhood thyroid cancers have already been observed in Belarus and Ukraine and the Bryansk regions of Russia. The increase has been over 100-fold in some areas with heavy contamination. From the viewpoint of overall public health, the outlook of direct health effects of the Chernobyl accident are likely to be severe only among some limited subgroups, such as young children exposed to high levels of fallout nuclides. In absolute terms, the global number of Chernobyl-associated cancer cases can be estimated to be tens of thousands, but only a small fraction of these is likely to be discernible epidemiologically.

Language: English

Keywords: Review / Cancer / Congenital abnormalities

Tarabrina NV, Lazebnaia EO, Zelenova ME.

Psychological characteristics of post-traumatic stress states in workers dealing with the consequences of the Chernobyl accident.

Journal of Russian and East European Psychology, 2001; 39(3): pp.29-42
Chernobyl nuclear accident, 1986, Chernobyl, former Soviet Union

OBJECTIVE: To study the characteristics of posttraumatic stress disorders in persons who participated in work dealing with the consequences of the Chernobyl power plant accident.

METHODS: About six years after the disaster, 71 workers were assessed by means of the structured clinical interview for DSM-III-R (SCID).

Furthermore, Russian versions of the clinically administered PTSD Scale (CAPS) and the Gorovits Impact of Event Scale (IOES) were used.

RESULTS: Fourteen subjects (20%) met all the criteria for PTSD and 16 persons (22%) constituted a "risk group", i.e. they exhibited intensive posttraumatic symptoms. A total absence of posttraumatic symptoms or the presence of isolated mild symptoms was observed in 41 subjects (58%).

Differences in the perception of the traumatic situation at the nuclear power station between PTSD and normal subjects were negligible. Among the classic symptoms of PTSD, the most frequently reported were hyper-irritability, sleep disorders and concentration problems.

CONCLUSIONS: These results show that, after six years, a considerable number of workers were still suffering from PTSD or posttraumatic symptoms.

Language: English

Keywords: Cross-sectional study / Rescue workers / PTSD / Posttraumatic symptoms

Bromet EJ, Parkinson DK, Dunn LO.

Long-term mental health consequences of the accident at Three Mile Island.

International Journal of Mental Health, 1990; 19(2): pp.48-60

Three Mile Island plant nuclear accident, 1979, Harrisburg, United States

OBJECTIVE: To examine three specific aspects of mental and emotional distress, i.e. depression, anxiety and hostility, in three high risk groups who were involved in the Three Mile Island nuclear accident. As a result of this accident, 144,000 people were evacuated.

METHODS: The three groups were: mothers of young children living within 10 miles of the Three Mile Island plant, workers employed at the plant at the time of the accident and community mental health patients residing within 10 miles of the plant. The groups were compared with subjects living near another nuclear power plant and with subjects living near two coal-fired generating plants. The samples were interviewed four times after the accident; after 9, 12, 30 and 42 months. Instruments used were the SCL-90, the Schedule for Affective Disorders and Schizophrenia, Lifetime Version (SADS-L) and the accompanying Research Diagnostic Criteria.

RESULTS: During the 12-month period after the event, the prevalence rates for depression and/or anxiety were considerably higher in the TMT groups than in the controls. However, the rate of the control groups increased dramatically in the 13-30 month period, due to unemployment as a result of a recession in the steel industry. Among the TMT employees, the initially higher one-year prevalence rate declined ; among the TMT mothers, the rate was stable across time. With respect to the SCL-90 hostility subscale, the symptoms of the mothers comparison groups increased also; the symptom profiles of the workers changed little over time. TMT mothers who perceived the plant as dangerous had similar rates of depression and anxiety

as those perceiving the plant as not dangerous. However, at the 42-month follow-up the rates of mothers who acknowledged that TMI was dangerous were higher. Mothers living within five miles of the plant were somewhat more likely than other mothers to experience a clinical episode, and the discrepancies increased over time.

CONCLUSIONS: These findings suggest that mothers of young children remain a vulnerable subgroup of an affected population long after the event. Also the hypothesis is supported that perception of threat influences adjustment; people unable to deny a situation's danger fare more poorly. In contrast to the mothers, workers employed at the TMI plant experienced an initial surge of distress that was short-lived.

Language: English

Keywords: Longitudinal study / Control group comparison / Mothers / Employees / Depressed feeling / Anxiousness / Psychological distress

Dew MA, Bromet EJ.

Predictors of temporal patterns of psychiatric distress during 10 years following the nuclear accident at Three Mile Island.

Social Psychiatry and Psychiatric Epidemiology, 1993; 28(2): pp.49-55

Three Mile Island plant nuclear accident, 1979, Harrisburg, United States

OBJECTIVE: To study symptoms of psychiatric distress and their long-term course in mothers of young children following the Three Mile Island (TMI) accident.

METHODS: A panel of 267 women living within 10 miles of the accident participated in this study. All had delivered a child during the year before the accident. They were interviewed on four occasions: 9, 12, 30 and 42 months after the event. Of these 267 respondents, 110 returned a follow-up questionnaire mailed 10 years after the TMI accident. The interviews included questions about demographic variables, lifetime history of depression and anxiety, coping styles, social support and reactions during the initial aftermath of the accident. Questionnaires used were the SCL-90, the Schedule for Affective Disorders and Schizophrenia – Lifetime Version (SADS-L) and the Sense of Mastery scale.

RESULTS: Cluster analysis showed that women's temporal profiles were found to be either (a) stable and at low, clinically non-significant levels of distress across all measurement points, or (b) at consistently elevated, clinically significant levels that varied with the timing of post-accident events such as the restart of the undamaged reactor and the 10th anniversary of the event. Subsequent multivariate analyses indicated that pre-accident

characteristics, as well as parameters reflecting respondents' initial involvement with, and reactions to the accident, were important for distinguishing between women within the two temporal profile groups. CONCLUSIONS: These results show that psychological distress caused by a disaster can persist for a long time; even 10 years afterwards. It suggests the need to develop intervention strategies for not only the short-term but also the long-term sequelae of disasters.

Language: English

Keywords: Longitudinal study / Mothers / Psychological distress / Depressed feeling / Risk factors

3.8 CHEMICAL DISASTERS

Dhara VR, Dhara R.

The Union Carbide disaster in Bhopal: a review of health effects.

Archives of Environmental Health, 2002; 57(5): pp.391-404

Explosion Union Carbide plant, 1984, Bhopal, India

OBJECTIVE: To examine human health effects that resulted from exposure to methyl isocyanate gas that leaked from the Union Carbide plant in Bhopal, India, in 1984. In this event, thousands of people died, directly or as a result of the after-effects. This review focused on the health effects of those who survived.

METHODS: The authors have reviewed published and unpublished studies on the health effects of the Bhopal disaster. The studies were conducted during both the early and late recovery periods.

RESULTS: In particular, the eyes, respiratory tract, and skin were exposed. Although mortality was initially high, it declined over time, but remained elevated among the most severely exposed population. Studies conducted during the early recovery period focused primarily on the ocular and respiratory systems. Major findings included acute irritable effects on the eyes and respiratory tract. In follow-up studies, persistent irritable effects, including ocular lesions and respiratory impairment were observed. Studies conducted during the late recovery period focused on various systemic health outcomes. Significant neurological, reproductive, neurobehavioural, and psychological effects were also observed.

CONCLUSIONS: Early and late recovery period studies suffered from several clinical and epidemiological limitations, including study design, bias, and exposure classification. The authors recommend long-term monitoring of the

affected community and use of appropriate methods of investigation that include well-designed cohort studies, case-control studies for rare conditions, characterisation of personal exposure, and accident analysis to determine the possible components of the gas cloud.

Language: English

Keywords: Review / Eye diseases / Skin diseases / Respiratory symptoms

Bertazzi PA, Consonni D, Bachetti S, Rubagotti M, Baccarelli A, Zocchetti C, Pesatori AC.

Health effects of dioxin exposure: a 20-year mortality study.

American Journal of Epidemiology, 2001; 153(11): pp.1031-1044

Commentary on this article:

Smith AH, Lopipero P.

Invited commentary: how do the Seveso findings affect conclusions concerning TCDD as a human carcinogen?

American Journal of Epidemiology, 2001; 153(11): pp.1045-1047; authors' reply 1048-1049

Chemical accident of dioxin leakage, 1976, Seveso, Italy

OBJECTIVE: To study the long-term health effects (mortality and morbidity) of dioxin exposure after the chemical accident in Seveso.

METHODS: Follow-up of a previously studied population was extended to 1996. The study population was comprised of all people, both sexes and all ages, residing in the affected area on the date of the accident or entering in the 10-year period afterwards the districts in any of the study zones or in the surrounding non-contaminated area. The population living in this latter territory was adopted as the reference group. Dioxin blood levels were measured. The search for vital status and cause-of-death ascertainment for the deceased subjects was performed on an individual basis by contacting the vital statistics offices of the study towns. Death rates in the pre-and post-accident periods were compared also.

RESULTS: Fifteen years after the accident, mortality among men in high-exposure zones A (804 inhabitants) and B (5,941 inhabitants) increased for all cancers (rate ratio (RR) = 1.3), rectal cancer (RR = 2.4), and lung cancer (RR = 1.3), with no latency-related pattern for rectal or lung cancer. An excess of lymphohemopoietic neoplasms was found in both genders (RR = 1.7). Hodgkin's disease risk was elevated in the first 10-year observation period (RR = 4.9), whereas the highest increase for non-Hodgkin's lymphoma (RR = 2.8) and myeloid leukaemia (RR = 3.8) occurred after 15 years. No soft tissue sarcoma cases were found in these zones (0.8 expected).

An overall increase in diabetes was reported, especially among women (RR = 2.4). Chronic circulatory and respiratory diseases were moderately increased, suggesting a link with accident-related stressors and chemical exposure.

CONCLUSIONS: These results support evaluation of dioxin as carcinogenic to humans and corroborate the hypotheses of its association with other health outcomes, including cardiovascular- and endocrine-related effects.

Language: English

Keywords: Longitudinal study / Control group comparison / Cancer / Dioxin

Crighton EJ, Elliott SJ, Meer J van der, Small I, Upshur R.

Impacts of an environmental disaster on psychosocial health and well-being in Karakalpakstan.

Social Science & Medicine, 2003; 56(3): pp.551-567

Drying of the Aral Sea, since 1960's, Karakalpakstan, Uzbekistan

OBJECTIVE: The drying of the Aral Sea and accompanying ecological consequences led to a multitude of health problems. In case studies of other environmental disasters it was shown that environmental exposures may impact not only the physiological but also the psychosocial health of individuals. The aim of this study was to determine the contribution of the Aral Sea disaster to the psychosocial health of people living in Karakalpakstan, a semi-autonomous Republic in Uzbekistan.

METHODS: A survey was carried out by Medecins Sans Frontieres, with the assistance of the McMaster Institute of Environment and Health, local Universities and health care workers, on a random sample of 1,118 individuals aged 18 years and older in three communities in Karakalpakstan in May/June 1999. The communities were chosen according to distance from the former seashore, urban/rural characteristics and ethnic composition. The survey included questions about perceived general health, the General Health Questionnaire (GHQ), the somatic symptom scale of the SCL-90, questions about perceptions of the environmental disaster, social support as well as socio-demographic and socio-economic characteristics.

RESULTS: Findings show that 41% of all respondents reported environmental concern while 48% reported levels of somatic symptoms (SCL-90) associated with emotional distress, above the normalised cut-off point. Significant differences in levels of emotional distress were reported between men and women as well as between ethnic groups.

CONCLUSIONS: Environmental problems are commonly perceived to be the cause of somatic symptoms and are significantly associated with self-rated health status.

Language: English

Keywords: Cross-sectional study / Psychological distress / Physical symptoms

Bowler RM, Mergler D, Huel G, Cone JE.

Psychological, psychosocial, and psychophysiological sequelae in a community affected by a railroad chemical disaster.

Journal of Traumatic Stress, 1994; 7(4): pp.601-624

Train disaster with spill of pesticide metam sodium, 1991, Northern California, United States

OBJECTIVE: To study the psychological, psychosocial, and psychophysiological sequelae in a community which had experienced a railroad chemical spill of 19,000 gallons of the toxic pesticide metam sodium. Shortly after the spill, more than 800 people sought medical aid, including 278 emergency room visits and hospital admissions.

METHODS: Two hundred twenty exposed residents were compared to 114 controls matched on age, education, gender, race, and number of children. A clinical interview and physiological measurements (blood pressure, pulse, and cortisol level) were taken, the MMPI-II, Impact of Event Scale (IES), Mood Scale, Environmental Worry, Perceived Social Support, Perceived Control Scale and the Profile of Mood States – Revised (POMS) were administered.

RESULTS: Increased levels of depression, anxiety, and somatic symptoms were found in the exposed residents, as well as increases in environmental worry and lower perceived social support. Exposed residents had higher blood pressure and less fluctuation of cortisol levels than controls. No difference on litigation status was obtained except on the IES, Intrusion and the POMS scales.

CONCLUSIONS: Chemical disasters are associated with a wide variety of psychological, psychosocial, and physiological distress.

Language: English

Keywords: Control group comparison / Depression / Anxiety disorder / Posttraumatic symptoms

David AS, Wessely SC.

The legend of Camelford: medical consequences of a water pollution accident.

Journal of Psychosomatic Research, 1995; 39(1): pp.1-9

Water pollution emergency, 1988, Camelford, United Kingdom

OBJECTIVE: To study the medical consequences of the environmental accident in the Cornish town of Camelford. In this accident, 20 tons of aluminium sulphate was accidentally released into a water supply in 1988. Events subsequent to the accident are recounted to explore why, despite lack of evidence of long-term health effects of brief aluminium contamination, some people suffered and complained for years afterwards.

METHODS: The authors studied official reports and other published studies.

RESULTS: The official reports give no support to adverse health effects as a direct consequence of a sudden, temporary increase in aluminium consumption. Yet, some people suffer for years after the event. The authors try to explain this discrepancy by citing studies executed after similar events, in which substantial increases in psychiatric morbidity was found, following either documented environmental toxicity or even rumours of such exposure.

CONCLUSIONS: It is argued that the most likely explanation of these complaints is that the perception of normal and benign physical symptoms among residents and health professionals was heightened and attributed to an external, physical cause. Other influences, including perceived increases in anxiety-related symptoms, somatisation disorders, and subsequent litigation are discussed. Future investigations of environmental incidents should recall that social and cultural factors are as important as medical ones in shaping public concern.

Language: English

Keywords: Review / Environmental incident / Anxiousness / Somatisation

Gomez de la Camara A, Posada de la Paz M, Abaitua Borda I, Barainca Oyague MT, Abraira Santos V, Ruiz-Navarro MD, Terracini B.

Health status measurement in Toxic Oil Syndrome.

Journal of Clinical Epidemiology, 1998; 51(10): pp.867-873

Outbreak of intoxication after consuming olive oil, 1981, Spain

OBJECTIVE: To examine the health status of survivors of the Toxic Oil Syndrome (TOS), which affected more than 20,000 people in Spain in 1981.

METHODS: In 1993-94, more than 10 years afterwards, a stratified random sample of 1,400 survivors was drawn to measure their health status through

clinical examination and their self-perception of well-being using the Nottingham Health Profile Questionnaire (NHPQ).

RESULTS: Two-thirds of the sample population responded; indirect estimates suggest that selection bias was limited. All conditions were more frequent in women than in men and in age >50 than in younger ages.

Although no concurrent control group was included in the study, prevalences of these conditions are well above expectations and are largely attributable to TOS. NHPQ scores increased with age in both sexes up to age 50, after which they reached a plateau (with values around 48 in men and 62 in women). Scores were associated to the occurrence of peripheral neurological changes, contractures, and scleroderma-like conditions. A multivariate analysis indicated age, sex, and severity of neurological conditions as major determinants of the NHPQ scores.

CONCLUSIONS: The TOS episode has no precedents, the overall pattern of findings is peculiar to TOS and differs from the typical post-disaster non-specific syndrome. Thousands of people are still affected by the consequences of the disease. However, the health effects are partly perceived only on a subjective basis.

Language: English

Keywords: Cross-sectional study / Neuropathy / Skin diseases / Contractures

3.9 DISASTERS IN CROWDS

Wright JC, Binney V, Kunkler J.

Psychological distress in the local Hillsborough or "Host" community following the Hillsborough Football Stadium disaster.

Journal of Community & Applied Social Psychology, 1994; 4: pp.77-89
Hillsborough Football Stadium disaster, 1989, Sheffield, United Kingdom

OBJECTIVE: To study levels of psychological distress and cognitive processing strategies among the local host community following the Hillsborough Football Stadium disaster. In this event, 95 spectators were crushed to death and over 400 received hospital treatment.

METHODS: Thirty-two survivors were interviewed four to six months after the event. The Mental Disorders-III (DSM-III) criteria for posttraumatic stress disorder, the General Health Questionnaire-28 (GHQ-28) and the Impact of Events Scale (IES) were used as outcome measures. Cognitive processing was assessed in a semi-structured interview.

RESULTS: Residents of the Hillsborough stadium area showed high levels of distress and emotional intrusion and avoidance. With respect to cognitive processing, there were significant associations between attribution and reported distress (single attributions were significantly associated with high level of distress), and high exposure and perceived causal agents, suggesting that people living close to the stadium were significantly more likely to see the fans as the sole cause of the disaster. Besides, high exposure residents made more attributions.

CONCLUSIONS: These results show high levels of distress and associations between level of distress and causal attributions of the disaster. The levels of distress are almost as high as one might expect from primary victims.

Language: English

Keywords: Cross-sectional study / Posttraumatic symptoms / Psychological distress

4 ABSTRACTS OF MISCELLANIOUS ARTICLES

Barrett B.

Occupational stress, rescue workers and English law.

Work & Stress, 1995; 9(4): pp.394-404

The aim of this article is to review English law with respect to compensation for physical and psychological injury in survivors of disasters and rescue workers. One strand of the law deals with establishing liability to compensate for shock suffered by those at the scene of disaster, and the other is concerned with physical injury suffered by rescuers. Also, a description is given of the development of employers' liability in this context, but the law provides few examples of the contractual duty of employers to protect employees against stress that may cause psychological injury. There is no law on the liability of employers for stress suffered by rescue workers. Law reports give little guidance as to the medical evidence judges require to persuade them that nervous shock has been suffered. European Commission-inspired regulations could be used to require employers to assess and take steps to control stress to which their employees, including rescue workers, are exposed.

Language: English

Keywords: Review / Rescue workers / Legislation

De Silva P.

Post-traumatic stress disorder: cross-cultural aspects.

International Review of Psychiatry, 1993; 5(2-3): pp.217-229

The aim of this article is to discuss the cross-cultural aspects of posttraumatic stress disorder (PTSD). An overview is given of the history of the concept of PTSD, early research on traumatic stress and on the occurrence in different cultures. Also, reactions to natural and man-made disasters and to warfare, that have been reported from diverse cultures, are selectively reviewed. Psychological stress reactions occur in diverse societies and cultures. The treatment of PTSD, using a range of behavioural and cognitive techniques is, in principle, feasible in non-Western cultures, but culturally suited additions and modifications may profitably be made. There is potentially a major role for local social support systems in the prevention of PTSD in victims of traumatic events.

Language: English

Keywords: Review / PTSD / Cross-cultural differences

Engel CC.

Outbreaks of medically unexplained physical symptoms after military action, terrorist threat, or technological disaster.

Military Medicine, 2001; 166(12 Supply): pp.47-48

This article deals with the challenges for clinicians posed by medically unexplained physical symptoms (MUPS), especially in relation to disaster or war. Polarised public discussion over science, policy and media evidence following such events may reinforce the notion of cover-ups, create mutual doctor-patient mistrust, amplify symptom-related psychosocial distress and disability, and lead to unnecessary use of services. Under these circumstances, the clinician must always show respect, empathy, and validation for a patient's concerns. A skeptical attitude may induce efforts by patients to "prove" their symptoms are "real." If MUPS are discounted as a "non-problem," they may become a much bigger public health problem. Anecdotes from patients who feel their symptoms and concerns have been dismissed by an unfeeling government clinician become grist for media and political mills. The anecdotes multiply and then infect the network of concerned individuals, sensitising them to otherwise normal bodily symptoms.

Language: English

Keywords: Discussion / MUPS / Mass media / Public health

Fothergill A, Maestas EG, Darlington JD.

Race, ethnicity and disasters in the United States: a review of the literature.

Disasters, 1999; 23(2): pp.156-173

OBJECTIVE: To give an overview of the existing literature on issues of race and ethnicity in relation to disaster.

METHODS: The Natural Hazards Center Library at the University of Colorado was a starting-point for collecting articles about the social aspects of natural disasters. The focus was on the United States and on disaster-like hurricanes, floods and earthquakes. A typology was used based on the stages of a disaster event.

RESULTS: Six studies were found on risk perception. Some illustrate that racial and ethnic communities had a heightened perception of disaster risk, while others found no differences. Little is known about racial and ethnic differences in disaster preparation. With respect to warning communication and response, differences in the use of social networks were found in seven studies. Ethnic differences in the extent to which warnings from authorities were considered reliable were found in two studies. With regard to physical impacts, higher rates of mortality and injury were found in minority groups and higher levels of fear or stress were found. Three studies were found on psychosocial recovery, with slower recovery and higher amounts of posttraumatic symptoms in Afro-Americans. With respect to the recovery stage, significant ethnic differences were also found. It appears that minorities were likely to have experienced a decline in their standard of living compared to white communities.

CONCLUSIONS: Many findings illustrate that racial and ethnic communities in the United States are more vulnerable to natural disasters, due to factors such as language, housing patterns, building construction, community isolation and cultural insensitivities.

Language: English

Keywords: Review / Race / Ethnicity

Krug EG, Kresnow M, Peddicord JP, Dahlberg LL, Powell KE, Crosby AE, Annest JL.

Suicide after natural disasters.

New England Journal of Medicine, 1998; 338(6): pp.373-378

OBJECTIVE: To examine whether the increased prevalence of PTSD and depression in survivors of natural disasters leads to an increase in suicide rates.

METHODS: Three hundred and seventy-seven counties in the USA were selected that had each been affected by a single natural disaster during the years 1982-1989. Data were collected on suicides during the 36 months before and the 48 months after the disaster and the data were aligned around the month of the disaster. Pooled rates were calculated according to the type of disaster. Comparisons were made between the suicide rates before and those after disasters in the affected counties and in the entire United States.

RESULTS: Suicide rates increased in the four years after floods by 13.8%, from 12.1 to 13.8 per 100,000; in the two years after hurricanes by 31%, from 12 to 15.7 per 100,000; and in the first year after earthquakes by 62.9%, from 19.2 to 31.3 per 100,000. The four-year increase of 19.7% after

earthquakes was not statistically significant. Rates computed in a similar manner for the entire United States were stable. The increases in suicide rates were found for both sexes and for all age groups. The suicide rates did not change significantly after tornadoes or severe storms.

CONCLUSIONS: These findings show that suicide rates increase after severe earthquakes, floods, and hurricanes and confirm the need for mental health support after severe disasters.

Language: English

Keywords: Pre-post comparison / Suicide rates

Goenjian AK, Steinberg AM, Najarian LM, Fairbanks LA, Tashjian M, Pynoos RS.

Prospective study of posttraumatic stress, anxiety, and depressive reactions after earthquake and political violence.

American Journal of Psychiatry, 2000; 157(6): pp.911-916

Armenian Earthquake, 1988, Armenia

Pogroms against Armenians, 1988, Azerbaijan

OBJECTIVE: To examine the severity and longitudinal course of posttraumatic stress, anxiety, and depressive reactions among adults exposed to the earthquake in Armenia in 1988, and among people exposed to violence, i.e. the 1988 pogroms against Armenians in Azerbaijan. A second objective was to examine interrelationships between these reactions and predictors of outcome, and to compare posttraumatic stress disorder (PTSD) symptom category profile and course between those exposed to the earthquake and those exposed to violence.

METHODS: Seventy-eight non-treatment-seeking subjects were assessed with self-report instruments approximately 1.5 and 4.5 years after the events. Measures used were the PTSD Reaction Scale, Hamilton Depression Rating Scale and Hamilton Anxiety Rating Scale.

RESULTS: The two groups that had been exposed to severe trauma (earthquake or violence) had high initial and follow-up PTSD scores that did not abate over the three-year interval. Overall, depressive symptoms subsided. Posttraumatic stress, anxiety, and depressive reactions were highly intercorrelated within and across both time intervals. No significant differences in PTSD severity, profile, or course were found between subjects exposed to severe earthquake trauma versus those exposed to severe violence.

CONCLUSIONS: After exposure to severe trauma, either an earthquake or violence, adults are at high risk of developing severe and chronic

posttraumatic stress reactions that are associated with chronic anxiety and depressive reactions. Clinical evaluation and therapeutic intervention should include specific attention to these reactions. Early mental health intervention is recommended to prevent their chronicity.

Language: English

Keywords: Longitudinal study/ Posttraumatic symptoms/ Depressed feeling / Anxiousness

Maes M, Mylle J, Delmeire L, Altamura C.

Psychiatric morbidity and comorbidity following accidental man-made traumatic events: incidence and risk factors.

European Archives of Psychiatry and Clinical Neuroscience, 2000; 250: 156-162

Fire in hotel ballroom, 1994, Antwerp, Belgium

Highway accident, 1996, Deinze, Belgium

OBJECTIVE: To study the incidence and risk factors of major depression, bipolar disorder, psychoactive substance use, psychotic and anxiety disorders in relation to post-traumatic stress disorders (PTSD) in survivors of two different traumatic events: a fire and a motor vehicle accident. The fire took place in a hotel ballroom in Antwerp, Belgium; more than 120 people were injured and 10 people died. The accident took place on a Belgian highway caused by a sudden heavy fog, involving more than 150 cars.

METHODS: In this study, 128 survivors of the ballroom fire and 55 survivors of the highway accident participated. Data were collected between seven and nine months after the traumatic event. The diagnosis of axis-I diagnoses, other than PTSD, was made according to DSM-III-R criteria using the Structured Interview according to the DSM-III-R.

RESULTS: The incidence of new-onset major depression was 13%, generalised anxiety disorder (GAD) 12%, agoraphobia 10% and psychoactive substance use disorders 6%. Simple phobia, panic disorder and obsessive compulsive disorder had a much lower incidence (< 2%). Fifty-one percent of the victims with PTSD had one or more additional axis-I diagnoses, major depression (26%), agoraphobia (21%) and generalised anxiety disorder (24%) being the most common. Physical injury was the single best predictor for major depression. The best predictors for the development of new-onset anxiety disorders, other than PTSD, were: type and horror of the trauma, the extent of physical injury, the loss of control during the traumatic event, contextual stimuli, younger age and female sex.

CONCLUSIONS: These findings indicate that comorbid disorders, such as depression and anxiety disorders commonly occur within the first few months after man-made accidental traumata, and that trauma variables, which are known to be related to the development of PTSD, are also related to the occurrence of these comorbid disorders.

Language: English

Keywords: Cross-sectional study / PTSD / Depression / Anxiety disorder / Substance abuse / Risk factors / Comorbidity

McMillen JC, Smith EM, Fisher RH.

Perceived benefit and mental health after three types of disaster.

Journal of Consulting and Clinical Psychology, 1997; 65(5): 733-739

Tornado, 1988, Madison, Florida, United States

Plane crash, 1987, Indianapolis, United States

Mass shooting at Luby's cafeteria, 1991, Killeen, Texas, United States

OBJECTIVE: To study perceived benefit and mental health adjustment after three different types of disaster: a tornado in Florida, a mass shooting in Texas and a plane crash in Indianapolis.

METHODS: Forty-two survivors of the tornado, 136 of the shooting and 46 of the plane crash were interviewed between four and six weeks after the event. Three years later, 42 survivors of the tornado, 116 of the shooting and 41 of the plane crash were re-interviewed. The subjects were questioned about perceived benefit and their mental health was assessed using the Diagnostic Interview Schedule Disaster Supplement (DIS/DS).

RESULTS: Survivors of the tornado had the highest rates of perceived benefit, followed by survivors of the mass shooting and survivors of the plane crash. Perceived benefit four to six weeks postdisaster predicted posttraumatic stress disorder three years later. Perceived benefit moderated the effect of severity of disaster exposure on mental health diagnosis change over time. Without perceived benefit, as exposure severity increased, the amount of recovery decreased. If benefit was perceived, as exposure severity increased, the amount of recovery increased.

CONCLUSIONS: These findings suggest that perceiving benefit after negative events may have positive consequences. However, future research is needed to disentangle the relationships between coping strategies, perceived benefits and adjustment.

Language: English

Keywords: Longitudinal study / PTSD / Coping

Smith EM, North CS, Spitznagel EL.

Post-traumatic stress in survivors of three disasters.

Journal of Social Behavior and Personality, 1993; 8(5): 353-368

Tornado, 1988, Madison, Florida, United States

Plane crash, 1987, Indianapolis, United States

Shooting, 1987, Russellville, Arkansas, United States

OBJECTIVE: To study the risk factors for posttraumatic symptoms in survivors of three different disasters which took place in the United States: a tornado in Florida, a shooting incident in Arkansas and a plane crash in Indianapolis.

METHODS: One hundred and six participants (46 survivors of the plane crash, 18 of the shooting and 42 of the tornado) were interviewed between four and six weeks after the disaster. A modified version of the Diagnostic Interview Schedule Disaster Supplement (DIS/DS) was used. Equivalent data were systematically collected at all three disaster sites and merged for analysis.

RESULTS: The analysis revealed that the number of PTSD symptoms was predicted by association with the plane crash, direct exposure to the disaster and number of predisaster psychiatric diagnoses. However, the number of predisaster psychiatric diagnoses was predictive only for the indirectly exposed group. Qualitative experiences of terror and horror did not aid in the prediction of posttraumatic symptoms.

CONCLUSIONS: This analysis demonstrates the usefulness of combining data sets to identify predictors of posttraumatic stress which are not evident in individual analyses that are limited by small numbers.

Language: English

Keywords: Cross-sectional study / PTSD / Posttraumatic symptoms / Risk factors

5 ABSTRACTS OF REVIEWS

Schnurr PP & Green BL.

Understanding relationships among trauma, posttraumatic stress disorder, and health outcomes.

Advances in Mind-Body Medicine, 2004; 20(1): p.18-29

This article describes research on the relationship between stress and physical health. An integrative model that relates trauma to physical health through psychological, biological, behavioural, and attentional mechanisms is described.

Shalev AY, Tuval-Mashiach, R, Hadar H.

Posttraumatic stress disorder as a result of mass trauma.

Journal of Clinical Psychiatry, 2004; 65 Suppl 1: p.4-10

This article summarizes research on the acute and long-term psychological consequences of mass trauma, and factors that may be associated with an increased risk for posttraumatic stress disorder. In addition, the findings of a population study of two traumatized communities are discussed.

Alexander DA, Klein S.

Biochemical terrorism: too awful to contemplate, too serious to ignore: subjective literature review.

British Journal of Psychiatry, 2003; 183: p.491-497

The authors review several aspects of biochemical terrorism, such as aims of biochemical terrorism, community and individual reactions to biochemical incidents, mass psychogenic illness, the role of media after a biochemical incident, and mental health services and intervention strategies.

Clauw DJ, Engel CC Jr., Aronowitz R, Jones E, Kipen HM, Kroenke K, Ratzan S, Sharpe M, Wessely S.

Unexplained symptoms after terrorism and war: an expert consensus statement.

Journal of Occupational and Environmental Medicine, 2003; 45(10): p.1040-1048

Previous concerns regarding a possible "Gulf War syndrome" has resulted in concerns of a possible "World Trade Centre syndrome" and efforts to prevent unexplained symptoms following the most recent war in Iraq. Unexplained symptoms frequently occur after war and may also appear after terrorist attacks. An international, multidisciplinary, and multiinstitutional consensus project was completed to summarize current knowledge on unexplained symptoms after terrorism and war.

Havenaar JM & Bromet EJ.

De psychiatrische gevolgen van rampen: een overzicht van de epidemiologische literatuur.

(Psychiatric consequences of disasters: a review of epidemiological literature.)

Tijdschrift voor Psychiatrie, 2003; 45(7), p.367-376

This review article is a Dutch adaptation of the original book chapter of Bromet & Havenaar (2002; see below). In this article an overview is provided on the current knowledge on the psychiatric consequences of disasters. In addition, risk factors for mental health problems are summarized, and the effectiveness of psychological interventions is discussed.

Pfefferbaum B, Pfefferbaum RL, Gurwitch RH, Nagumalli S, Brandt EN, Robertson MJ, Aceska A, Saste VS.

Children's response to terrorism: a critical review of the literature.

Current Psychiatry Reports, 2003; 5(2): p.95-100

This report summarizes recent studies on the impact of terrorism on children and examines aspects of mental health services for children in the post-attack situation. Studies on the 1993 bombing of the World Trade Centre, the Oklahoma City bombing, the bombing of the American embassy in Kenya and the September 11 attacks are reviewed.

Bromet EJ & Havenaar JM.

Mental health consequences of disasters.

In: N. Sartorius, W. Gaebel, J.J. Lopez-Ibor, & M. Maj (Eds.).

Psychiatry in society. Chistester, United Kingdom: John Wiley & Sons, 2002: p.241-261.

Research on mental health consequences of disasters is described. In addition, pre-disaster risk factors, risk factors during the disaster and post-disaster risk factors for mental health problems are summarized. Suggestions for future directions of disaster research are provided as well.

Gidron Y.

Posttraumatic stress disorder after terrorist attacks: a review.

Journal of Nervous and Mental Disease, 2002; 190(2): p.118-121

This review gives an overview of the literature in which the prevalence and risk factors of posttraumatic stress disorder after terrorist attacks have been examined.

Norris FH, Friedman MJ, Watson PJ, Byrne CM, Diaz E, Kaniasty K.
60,000 disaster victims speak: part I. An empirical review of the empirical literature, 1981-2001.

Psychiatry, 2002; 65(3): p.207-239

An empirical review was conducted on 160 samples of disaster victims. Disaster type, disaster location, outcomes and risk factors, and overall severity of impairment were recorded. Outcomes included: specific psychological problems, non-specific distress, (physical) health problems, chronic problems in living, resource loss, and problems specific to youth. Risk factors for adverse outcomes were discussed as well.

Norris FH, Friedman MJ, Watson PJ.

60,000 disaster victims speak: part II. Summary and implications of the disaster mental health research.

Psychiatry, 2002; 65(3): p.240-260

On the basis of the literature reviewed in a companion article (Part I), the authors discuss and recommend early interventions following disasters, especially when the disaster is characterized by extreme and widespread damage to property, ongoing financial problems, violence resulting from human intent, a high prevalence of injuries, threat to life, and loss of life.

Katz CL, Pellegrino L, Pandya A, Ng A, DeLisi LE.

Research on psychiatric outcomes and interventions subsequent to disasters: a review of the literature.

Psychiatry Research, 2002; 110(3): p.201-217

This review examines whether there exists a scientific basis for the practice of psychiatry in the aftermath of disasters. Literature on the psychiatric morbidity following disasters and predictors of subsequent psychiatric illness is reviewed. The data that presently exist on the effectiveness of acute psychiatric interventions subsequent to disasters are discussed as well.

Noji EK.

The public health consequences of disasters.

Prehospital and Disaster Medicine, 2000; 15(4): p.147-157

This report discusses the nature of disasters due to natural events of sudden onset. The medical and health needs associated with disasters, practical issues of disaster response, and the organization and management of disasters are discussed as well. In addition, an analysis of what is currently known about the health-care needs during some specific types of natural disasters, i.e. 1) floods, 2) cyclones, 3) tornadoes, 4) volcanic eruptions, and 5) earthquakes is described.

Gurwitch RH, Sullivan MA, Long PJ.

The impact of trauma and disaster on young children.

Child and Adolescent Psychiatric Clinics of North America, 1998; 7(1): p.19-32

This article discusses the characteristics of stress in young children, and their reactions to trauma and disaster. Mediating factors and interventions with young children are discussed as well.

Havenaar JM, Brink W van den.

Psychological factors affecting health after toxicological disasters.

Clinical Psychology Review, 1997 ; 17(4): p.359-374

This review summarizes the literature on the effects of toxicological disasters on health and health-related behaviours. Three questions are investigated: 1) Do toxicological disasters represent a specific type of stressor?; 2) Which stress-mediated health effects have been observed in the aftermath of toxicological disasters?; and 3) Is there evidence for an increased vulnerability in certain risk groups?

Bromet E, Dew MA.

Review of psychiatric epidemiologic research on disasters.

Epidemiologic Reviews, 1995;17(1): p.113-119

This paper reviews the methodological issues and recent findings from research on the short-term and long-term psychological effects of disasters. It is concluded that disaster studies continue to be designed without attention to basic epidemiological principles.

Koopman C, Classen C, Cardena E, Spiegel D.

When disaster strikes, acute stress disorder may follow.

Journal of Traumatic Stress, 1995; 8(1): p.29-46

This article focuses on the prevalence of acute stress disorder following major traumatic events, including disasters. 15 studies that specifically examined psychological reactions of survivors within the first month after the event were reviewed. This review of the literature suggests that a pattern of symptoms consistent with acute stress disorder has often been identified across different kinds of traumatic events.

Vogel JM, Vernberg EM.

Children's psychological responses to disasters.

Journal of Clinical Child Psychology, 1993; 22(4): p.464-484

In this review the psychological responses of children to disasters are discussed and put in a historical perspective. Factors associated with children's responses to disasters are summarized as well.

Rubonis AV, Bickman L.

**Psychological impairment in the wake of disaster: the disaster-
psychopathology relationship.**

Psychological Bulletin, 1990; 109(3): p.384-399

In this review the relationship between disasters and psychopathology outcome for 52 studies was examined. Meta-analysis was executed for 31 studies which had either pre-disaster data or data from a control group. The relationships among four sets of variables were examined: characteristics of the victim population, characteristics of the disaster, study methodology, and the type of psychopathology.

Non-disaster review articles

Yehuda R.

Biology of posttraumatic stress disorder.

Journal of Clinical Psychiatry, 2000; 61 suppl 7: p.14-21

This review article examines some of the biological alterations in posttraumatic stress disorder and develops a framework for understanding the development progression of the neurobiology of this disorder.

Summerfield D.

**The invention of post-traumatic stress disorder and the usefulness of a
psychiatric category.**

British Medical Journal, 2004; 322: p.95-98

In this article the concept of post-traumatic stress disorder is critically reviewed. The paper highlights some of the medical and sociological discussions about post-traumatic stress disorder.

6 BOOKS AND BOOK CHAPTERS FOR FURTHER READING

Dohrenwend BP. **Adversity, stress, and psychopathology.** London: Oxford University Press, 1998.

Figley CR (Ed.). **Trauma and its wake. Vol. I: The study and treatment of posttraumatic stress disorder.** New York: Bruner/Mazel, 1985.

Figley CR (Ed.). **Trauma and its wake. Vol. II: Traumatic stress theory, research, and intervention.** New York: Bruner/Mazel, 1985.

Havenaar JM, Cwikel JG & Bromet EJ (Eds.). **Toxic turmoil. Psychological and societal consequences of ecological disasters.** New York: Kluwer Academic/Plenum Publishers, 2002.

Hobfoll SE & de Vries MW (Eds.). **Extreme stress and communities: Impact and intervention.** Dordrecht, The Netherlands: Kluwer Academic Publishers, 1995.

Kleber RJ, Figley CR & Gersons BPR (Eds.). **Beyond trauma. Cultural and societal dynamics.** New York: Plenum Press, 1995.

La Greca AM, Silverman WK, Vernberg EM, Roberts ME (Eds.). **Helping children cope with disasters and terrorism.** Washington, DC: American Psychological Association, 2002.

Noji EK (Ed.). **Public health consequences of disasters.** Oxford: Oxford University Press, 1997.

Schnurr PP & Green BL. **Trauma and Health. Physical health consequences of exposure to extreme stress.** Washington, DC: American Psychological Association, 2004.

Ursano RJ, Fullerton CS, Norwood AE (Eds.). **Terrorism and disaster. Individual and community mental health interventions.** Cambridge: Cambridge University Press, 2003.

Ursano RJ & Norwood AE (Eds.). **Trauma & disaster. Responses & management. Review of Psychiatry (Vol. 22)**. Washington, DC: American Psychiatric Publishing, 2003. (series editors: JM Oldham & MB Riba)

Ursano RJ, McCaughey BG & Fullerton CS (Eds.). **Individual and community responses to trauma and disaster: The structure of human chaos**. New York: Cambridge University Press, 1994.

Yehuda R (Ed.). **Risk factors for posttraumatic stress disorder**. Washington: American Psychiatric Press, 1999.

Yule W (Ed.). **Post-traumatic stress disorders. Concepts and therapy**. New York: John Wiley & Sons, 1999. The Wiley series in clinical psychology. Series editor: JMG Williams.

APPENDIX SEARCH STRATEGIES

PUBMED

((("Disasters"[MeSH] OR disast*) AND ("Health"[MeSH] OR "Stress Disorders, Post-Traumatic"[MeSH] OR "Mental Disorders"[MeSH] OR "Signs and Symptoms"[MeSH] OR health effects OR posttraumatic stress disorder OR stress reaction* OR psychosocial problems OR symptoms)) NOT ("Firesetting Behavior"[MeSH] OR "Psychotherapy"[MeSH])
Limits: Publication Date from 1990/01/01, only items with abstracts, Human

MeSH is the abbreviation of Medical Subject Headings; these are the keywords used in Pubmed/Medline. The explode function is used for each keyword, i.e. all narrower terms are included.

PSYCHINFO

#1 (("Disasters-" in DE) OR ("Natural-Disasters" in DE))
#2 disast*
#3 (#1 OR #2)
#4 (disaster planning or relief work)
#5 (#3 NOT #4)
#6 (("Health-" in DE) OR ("Health-Complaints" in DE) OR ("Mental-Health-+" in DE) OR ("Well-Being" in DE))
#7 (("Chronic-Illness" in DE) OR ("Mental-Disorders-+" in DE) OR ("Physical-Disorders-+" in DE))
#8 ("Symptoms-" in DE)
#9 (("Anxiety-Disorders" in DE) OR ("Emotional-Trauma" in DE) OR ("Posttraumatic-Stress-Disorder" in DE) OR ("Stress-Reactions" in DE) OR ("Traumatic-Neurosis" in DE))
#10 (("Psychological-Stress" in DE) OR ("Stress-" in DE))
#11 (#6 OR #7 OR #8 OR #9 OR #10)
#12 (#5 AND #11)
#13 (("Behavior-Therapy-+" in DE) OR ("Brief-Psychotherapy" in DE) OR ("Child-Psychotherapy-+" in DE) OR ("Cognitive-Therapy" in DE) OR ("Group-Psychotherapy-+" in DE) OR ("Individual-Psychotherapy" in DE) OR ("Psychotherapeutic-Counseling-+" in DE) OR ("Psychotherapeutic-Techniques-+" in DE) OR ("Psychotherapy-" in DE))
#14 ("Crisis-Intervention" in DE)
#15 (#13 OR #14)

#16 (#12 NOT #15)

DE is the abbreviation of Descriptors, which is another term for keywords.

EMBASE

#1 (aircraft accident OR disaster OR explosion OR radiation accident OR occupational accident OR nuclear accident) [all keywords, with explode function]
#2 disast*
#3 (accidents AND (aviation OR occupation* OR radiation))
#4 (#1 OR #2 OR #3)
#5 (accident prevention OR accident proneness OR disaster planning) [all keywords, with explode function]
#6 (#4 NOT #5)
#7 (health OR health status OR mental health) [all keywords, with explode function]
#8 (health effects or posttraumatic stress disorder or psychosocial problems)
#9 (mental disease or psychosomatic disorder) [all keywords, without explode function]
#10 stress [keyword, without explode function]
#11 (#9 OR #10)
#12 (#7 OR #8 OR #11)
#13 (#6 AND #12)
#14 mental health care [keyword, with explode function]
#15 (psychiatric treatment OR psychotherapy) [all keywords, with explode function]
#16 (#14 OR #15)
#17 (#13 NOT #16)
#18 limit #17 to (abstracts and human)

CINAHL

#1 disasters OR natural disasters OR accidents, aviation OR accidents, occupational [all keywords, without explode function]
#2 disast* or (accidents and (aviation or industrial or occupation* or radiation))
#3 (#1 OR #2)
#4 disaster planning [keyword, without explode function]
#5 relief work

#6 (#4 OR #5)
#7 (#3 NOT #6)
#8 health OR health status OR stress OR stress disorders, post-traumatic OR stress, psychological OR mental disorders OR psychophysiological disorders OR mental health OR psychological well being OR chronic disease OR anxiety disorders [all keywords, without explode function]
#9 health effects OR psychosocial problems
#10 (#8 OR #9)
#11 (#7 AND #10)
#12 psychotherapy [keyword, with explode function] OR crisis intervention [keyword, without explode function]
#13 (#11 NOT #12)

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