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Effects of the medical investigation Bijlmermeer aviation disaster on health perception of residents and rescue workers

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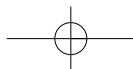
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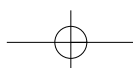
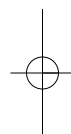
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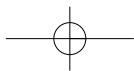
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Chapter 1

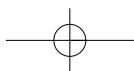
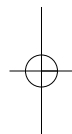
General introduction





Chapter 1

General introduction



Introduction

In the years following the Bijlmermeer aviation disaster on October 4th 1992, there was growing concern about the physical and psychological health of the residents and rescue workers exposed to the disaster. Persisting rumours about the cause of the crash, possible toxic exposure and health consequences led more than eight years later to the Medical Investigation Bijlmermeer Aviation Disaster (Dutch acronym: MOVB). The main aims of this investigation were to explore a possible association between health complaints of rescue workers and residents involved in the disaster and exposure to the disaster, and to reduce concerns and insecurities among those involved. The MOVB consisted of two main studies: an epidemiological investigation to assess the relationship between health complaints and exposure to the disaster and an individual medical examination for all individuals who considered themselves to be suffering from the consequences of the disaster. On top of these studies an examination of the effects of participation was carried out, specifically assessing a hoped-for decrease in health complaints and worries. The MOVB provided a unique opportunity to study these effects with appropriate, health-related measures. This thesis focuses on the short- and long-term effects of participation in the MOVB among residents and rescue workers involved in varying degrees in the Bijlmermeer Aviation Disaster. In this introduction an overview of the topic, and the aims and design of the study will be presented.

Health consequences of disasters

Attention for the health consequences of disasters has been growing during the last decades. Studies have shown that in a significant proportion of individuals psychopathological symptoms such as post-traumatic stress, anxiety, depression, substance abuse and physical (somatisation) symptoms may persist for years (see Foa, Stein & McFarlane (2006) for a review). Establishing a relationship between disaster exposure and persistently elevated levels of mental and physical dysfunction is complex, because it remains unclear whether the exposure to the disaster itself or the exposure to the long-term aftermath of the disaster, in particular public concern, is the primary causative factor (Boin, van Duin & Heyse, 2001; Havenaar, de Wilde, van den Bout, Drottz-Sjöberg & van den Brink, 2003; Vasterman, Yzermans & Dirkzwager, 2005; Yzermans & Gersons, 2002). This may be especially true with respect to disasters with real or alleged exposure to hazardous chemicals. Besides the biological effects of the exposure itself, this kind of disaster may have a long-lasting impact on the well-being of those involved because of the uncertainty about potential physical and mental health effects (Baum, Fleming & Davidson, 1983;

Havenaar & van den Brink, 1997).

Cognitive factors are important putative mediators between trauma exposure and persistent health problems. Havenaar et al. (2003) showed that cognitive variables such as risk perception and sense of control play an important role as mediating factors in the explanation of subjective health differences between exposed and non-exposed victims of the Chernobyl disaster. Also, in a study on self-reported health among residents of a chromium wasted area and a control group, McCarron, Harvey, Brogan and Peters (2000) found no evidence of harm to health from exposure to chromium. However, worse scores on self-reported health in participants who believed chromium to be harmful to health point to the potential importance of perception and possible health anxiety.

Interventions for post-disaster distress

The previous studies showed that illness cognitions attributing health complaints to disaster exposure are associated with health complaints and therefore are a promising target for interventions. However, little is known about the best strategy to modify these cognitions. In one of the few studies in this field, Prince-Embury (1992) investigated whether six years after the nuclear accident at Three Mile Island, Harrisburg, Pennsylvania a course designed to offer relevant, credible information on health issues of concern in the community affected the level of psychological symptoms and perception of control. It was observed that in a selected group of information seekers from the vicinity of the disaster site, greater understanding of the information and education provided was associated with only a slight decrease in psychological symptoms. Moreover, higher rated perceived reliability of course information that openly acknowledged conditions of uncertainty was associated with less perceived control.

As has become increasingly evident from studies in patients who present with symptoms that their physician cannot explain by a known somatic disease, reassurance about risk and disease is best accomplished in a face-to-face relationship in which the physician tries to provide tangible explanations that make sense to the patient and allow them to better manage the symptoms (Salmon, 2006). However, available studies also indicate that these positive reassuring effects may be short-lived and that after several weeks health anxiety may re-emerge especially in patients with high levels of health anxiety at baseline (Lucock, Morley, White & Peake, 1997; Rimes & Salkovskis, 2002). Generalizing these findings from primary and specialized medical care to the context of public health, one possible strategy is to reassure persons with long-standing symptoms after exposure to a disaster about their health on the basis of a medical examination addressing their health concerns

and anxieties. More specifically, it could be argued that a medical examination will have reassuring effects because persons can present their persistent symptoms, discuss their health anxieties, and after a medical examination will receive an individualized explanation for their symptoms and referral for further examination or treatment if necessary.

Effects of participation in trauma-focused studies

In recent years there has been growing attention to the emotional reactions of participants in trauma-focused studies. The risk of such research causing distress and having a negative impact on the mental state of participants has been assessed in several studies (e.g. Runeson & Beskow, 1991; Newman, Walker & Gefland, 1999; Boscarino et al., 2004). The prevalence of distress in trauma-focused studies is generally higher than in studies which focus on the participant's psychiatric state (Jorm, Kelly & Morgan, 2007). However, little indication was found for any long-term harm to participants.

In their review article on participant distress in psychiatric research Jorm et al. (2007) also report on the characteristics of participants who are most likely to become distressed. Generally, they are more likely to have mental disorders or symptoms, or have risk factors such as traumatic experiences. Post-traumatic stress symptoms were associated with distress due to study participation in several studies (e.g. Walker, Newman, Koss & Bernstein, 1997; Parslow, Jorm, O'Toole, Marshall & Grayson, 2000; Galea et al., 2005), as well as several socio-demographic variables such as age, sex and educational level.

In most of the studies on participant distress the prevalence is assessed with one or a few questions asked at the end of an interview or survey study investigating other issues. The only standardized instrument used is (part of) the Reactions to Research Participation Questionnaire (Newman, Willard, Sinclair & Kaloupek, 2001). We have no knowledge of any studies in this area using specific standardized instruments to assess the reaction of the participants to the subject of the examination they take part in. Only a few studies used a pre-post design to assess longer-term effects (e.g. Parslow et al., 2000; Halek, Murdoch & Fortier, 2005), let alone that a control group was included (see Celio, Bryson, Killen & Barr Taylor, 2003 for a notable exception).

Aims of the study

The first aim of the present study was to investigate whether participation in an individual medical examination or a trauma-focused epidemiological study will reduce persistent anxiety about health among residents and rescue workers in varying degrees involved in the Bijlmermeer Aviation Disaster.

The second aim was to study the effect of participation on self-reported physical and psychological health complaints.

The third aim was to assess which risk factors are related to changes in perception of current health problems.

Procedure

The MOVB project consisted of several parts, which were described in detail elsewhere (Medical Investigation Bijlmermeer Aviation Disaster Website, 2002; Slottje et al., 2005). An epidemiological study was performed into medical and psychological outcomes contrasting rescue workers who were and who were not involved in the disaster. Residents involved in varying degrees in the aviation disaster also took part in the epidemiological study. All participants were invited to participate in this study. After announcing the investigation in, e.g., house organs, letters were sent to potential participants, followed by phone calls. The medical investigation took around two and a half hours and consisted of filling in questionnaires (assisted by medical assistants and professional interpreters), measuring of body height and weight, and collection of blood, saliva and urine samples. Participants in the epidemiological study did not receive any individual feedback on the results of their medical investigation, unless the investigation revealed that further medical examinations were necessary.

Rescue workers and residents involved in the disaster were also offered an individual medical examination. Participants in this part of the study were not invited, but took part on their own initiative. Once the participants had put their names forward for the examination, they were sent a written invitation and asked to confirm it by telephone. Here, the procedure consisted of a medical examination and six weeks later a consultation with the physician to discuss the results of the examination. The medical examination took around four hours and consisted of completion of questionnaires (assisted by medical assistants and by professional interpreters), an examination of lung function, collection of blood and urine samples and medical history taking and physical examination by a medical doctor. At the consultation six weeks later each participant was given specific advice based on the findings of the examination, for instance that no grounds had been found for further examination, that a

further physical examination by their family doctor was warranted or that the participant might benefit from the special aftercare services set up for this purpose. Medical assistants and physicians were specifically trained in discussing health worries and anxieties and in giving personalized feedback in this particular group of people involved in the disaster.

If participants took part in both the epidemiological study and the medical examination, they were included in the group of participants of the medical examination, since they received individual feedback from the physician as opposed to the participants of the epidemiological study. This involved 27.8% of the residents and 35.5% of the rescue workers in the medical examination.

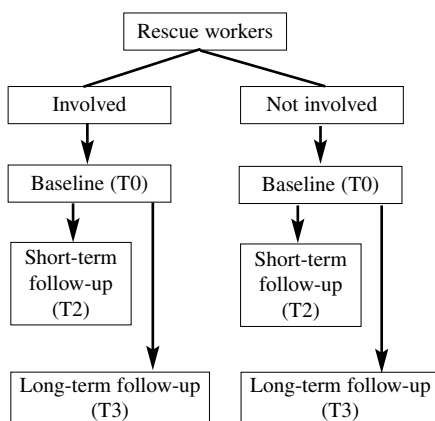
All participants received a public summary of the first results of the epidemiological study. More information was available on the website and in the newsletter of the project, and questions could be asked at meetings of the 'sounding-boards' of rescue workers and residents. The process of publicity was supervised by a communication expert.

Design

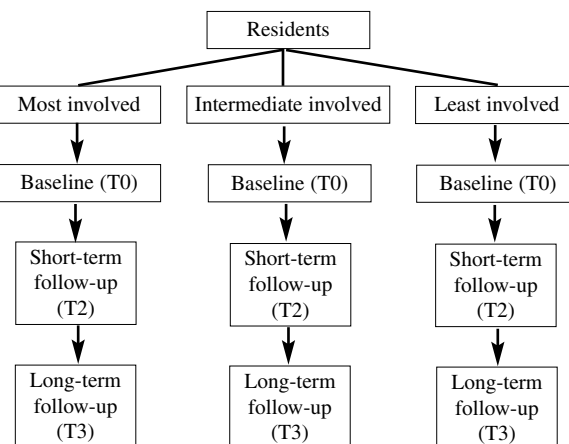
The present study is a prospective longitudinal study in both residents and rescue workers assessed at four time points: during the data collection of the epidemiological study and the individual medical examination (baseline), 6 weeks later during the consultation with a physician (post measurement, only in the medical examination), 12 weeks after the first examination (short-term follow-up) and six weeks after communication of the results of the epidemiological study among rescue workers (long-term follow-up), see Figure 1. All residents who completed the baseline assessment were also asked to complete both follow-up assessments, except for those dependent on interpreters. However, because of the large sample size a randomly selected subgroup of rescue workers who completed the baseline assessments was invited to complete either the short-term follow-up or the long-term follow-up assessments. Data collection took place eight years after the disaster at a general hospital in Amsterdam (baseline and post measurements) and by mail (short- and long-term follow-ups). The long-term follow-up measurement took place in April, 2003, at least one year after the baseline measurement which took place between December 2000 and March 2002. The research protocol was approved by the Medical Ethics Committee of the Leiden University Medical Center and all participants gave written informed consent for the use of their data from the medical investigation and separately for our study on the effects of participation.

Figure 1. Design MOVb Effects study

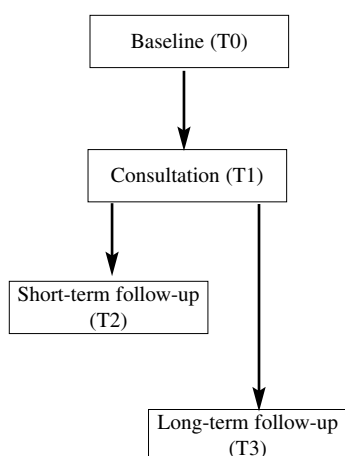
Rescue workers MOVb-Epidemiological



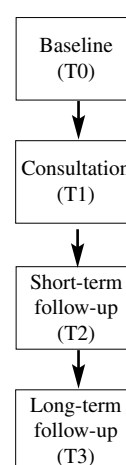
Residents MOVb-Epidemiological



Rescue workers MOVb-Individual



Residents MOVb-Individual



Participants

In the epidemiological study, the group of rescue workers consisted of professional fire-fighters employed in the Amsterdam fire department at the time of the disaster (almost all involved in the direct aftermath of the disaster) and a control group employed afterwards; police officers from the regional police force all employed on the date of the disaster and still employed at the start of this study; and accident and wreckage investigators both involved and not involved in the transport, security and sorting of the wreckage. At the time of the disaster, all residents eligible for the study were at least 16 years of age and registered as living in the Bijlmermeer district of the city of Amsterdam.

All individuals who considered themselves to be involved in the disaster or its aftermath (residents as well as rescue workers) could take part in the medical examination, on their own initiative. As such, the study sample of the individual medical examination consists of a self-selected group of persons concerned about their health.

Involvement in the disaster among rescue workers was assessed by having performed at least one of the following tasks: rescuing people, fire-extinguishing, providing security, providing first aid or support, cleaning up of destructed area, transport of injured, identification of victims, sorting of possible contaminated wreckage, transport of wreckage, burning of contaminated soil, or other disaster-related tasks (e.g. traffic management, or other tasks in hangar in the presence of the wreckage).

Residents were divided into three groups on the basis of the distance of their homes to the disaster site, as a proxy of their degree of involvement in the disaster. The residents who lived in one of the three struck apartment buildings were considered most involved. The second group of residents, while still living in the district, lived at maximum distance and outside the wind direction from the disaster site, and was considered least involved. The third group consisted of residents who lived in between the two other areas, and was considered to be intermediately involved. All three groups were similar with regard to ethnicity and social-cultural background.

Structure of the thesis

In Chapter 2 the results are described of a study that tested the hypothesis that a large-scale provision of an individual medical examination will reduce persistent anxiety about health and subjective health complaints after involvement in an aviation disaster with alleged exposure to hazardous chemicals. Changes in health experience between baseline, consultation and short-term follow-up were assessed.

The study presented in Chapter 3 investigated whether participation in a trauma-

focused epidemiological study reduced health complaints and concerns irrespective of trauma exposure. Changes in health experience of rescue workers and residents were assessed between baseline and short-term follow-up.

The study described in Chapter 4 investigates (a) the effectiveness of providing information on the health consequences of exposure to the aviation disaster to residents and rescue workers with varying degrees of exposure to the disaster and (b) individual characteristics which may moderate the effectiveness of the health information provided. This study assessed the long-term effects among participants of the individual medical examination and the epidemiological study.

The aim of the study reported on in Chapter 5 was to assess which risk factors are related to changes in perception of current health problems after participation in a trauma-focused study among rescue workers and residents in varying degrees involved in an aviation disaster. Prediction of short- and long-term changes was performed among participants of both the individual medical examination and the epidemiological study.

In Chapter 6 the results are shown of an investigation of the effect of cultural differences on the short-term effects of participation in the MOVb among residents of the Bijlmermeer district.

Chapter 7 provides a general discussion of the results with the main findings and suggestions for further research.

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