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

G A Donker, C J Yzermans, P Spreeuwenberg and J van der Zee

SUMMARY

Background: On 4 October 1992, an El Al Boeing 747-F cargo aeroplane crashed on two apartment buildings in Amsterdam. Thirty-nine residents on the ground and the four crew members of the plane died. In the years after, a gradually increasing number of people attributed physical signs and symptoms to their presence at the disaster scene.

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

Design of study: Comparison between self-reported symptoms to a call centre and GPs' medical records on onset and type of symptoms, diagnoses, and GPs' perception of association with the disaster, assessed by questionnaire.

Setting: Consenting patients (n = 621) contacting the call centre and their GPs.

Method: Patients were interviewed by the call centre staff and interview data were recorded on 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 disaster. Baseline differences and differences in reported symptoms between interviewed patients and their GP records were tested using the χ^2 test.

Results: The 553 responders 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 or nervous, 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 after (1998/1999, during a period of much media attention). Depression (7%), post-traumatic 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 have been reported to their GP, who related only a small proportion of these to the disaster.

Keywords: disaster; functional somatic syndrome; medically unexplained physical symptoms; post-traumatic stress disorder; medical records.

G A Donker, MD, MPH, PhD, family physician and epidemiologist; C J Yzermans, PhD, medical sociologist; P Spreeuwenberg, MSc, psychologist; and J van der Zee, PhD, medical sociologist, Netherlands Institute for Health Services Research (NIVEL), Utrecht, The Netherlands.

Address for correspondence

Dr G A Donker, NIVEL, PO Box 1568, 3500 BN Utrecht, The Netherlands. E-mail: ge.donker@inter.nl.net

Introduction

PLANE crashes are at present among the most feared and dreaded disasters.[1,2] Not only passengers are potential victims, but also people on the ground may be seriously impacted by loss of life, as well as experience extensive damage to their property or the environment. This occurred on 4 October 1992, when an El Al Boeing 747-F cargo aeroplane crashed on two apartment buildings in an Amsterdam suburb called the Bijlmermeer, a multicultural deprived neighbourhood with an immigrant majority. Thirty-nine residents on the ground and the four crew members of the plane died. In the years following the crash, suspicion arose in certain groups about several aspects of the crash; in particular, the flight route (the black box was never found), the plane (which had depleted uranium in its tail) and the cargo (neither the Dutch nor the Israeli authorities were able to retrieve full cargo specifications). A gradually increasing number of people in the region attributed physical signs and symptoms to their presence at the disaster scene and requested medical examination.

Six years after the crash, the Dutch parliament decided to conduct a parliamentary inquiry to determine the causes and consequences of the plane crash and its possible health effects. One year earlier (1997) the Ministry of Health had decided to enhance an exploratory study of the health of all those who considered themselves victims of the crash. This study was carried out in 1998 and 1999.[3] Victims were invited to report their symptoms by telephone and were asked to give informed consent to study their medical records. Although literature about health effects in the aftermath of disasters is growing, little is known about doctor–patient interaction in general practice in the years following a crash. The subject of this study is a comparison between patients' symptoms attributed to the crash, their consistency with symptoms and diagnoses as noted in their medical records in general practice, and general practitioners' (GPs') perception of a possible association with the crash. This investigation is possible as, in the Dutch health care system, each person is compulsorily registered on the list of only one GP. The GP functions as a gatekeeper; consultation with a medical specialist is not possible without being referred by the GP. Medical specialists report final results of their examination to the patient's GP.

The following questions will be answered:

1. How many and which symptoms reported to the call centre have also been reported to the GP? If they were reported, for how long have these symptoms been known to the GP? What was the GP's diagnosis for the

HOW THIS FITS IN

What do we know?

Stress exacerbates and perpetuates symptoms and lowers the threshold for medical help seeking.

What does this paper add?

Most symptoms that were attributed to a disaster by patients have been reported to their GP; however, GPs related only a small proportion of these to the disaster. A quarter of the symptoms that were attributed to the disaster by patients were reported to their GP either before, or six or more years after, the disaster took place. Many symptoms attributed to a disaster by patients would fit in the category 'medically unexplained physical symptoms'.

reported symptoms? When was this diagnosis made?

2. According to the GP, are the reported symptoms and diagnoses caused by the disaster? What are the GP's arguments for relating or not relating these symptoms or diagnoses to the disaster?

Method

Responders and GPs

A toll-free call centre staffed by 25 professional multilingual interviewers was established, to which people could present the health problems they attributed to the plane crash. Further explanation of the organisation of the call centre and recruitment of patients is reported in a separate article.[4] During two months (June and July 1998) ten telephone lines were open between 8.00 am and 10.00 pm. The interviews lasted on average 45 minutes. People were requested to call in themselves, with the exception of patients who were younger than 14 years, (who would have been eight years old at the time of the crash), too ill, or had a serious language barrier. In such cases a proxy was allowed to present the health problems in his or her place. At the end of the telephone interview objectives were explained and consent from the responders to ask his or her GP about symptoms in their medical records was sought. Entry of data from the telephone interview into a computerised database took place immediately after each call.

Data on the GP records were collected by sending questionnaires to patients' GPs, after receiving signed informed consent forms from their patients. Most GPs (90%) only had one or two such patients in their practice. All GPs with three or more patients (the greatest number of patients was 22) were offered assistance in examining the medical records. If additional information was considered appropriate then GPs' answer forms were accompanied by copies of specialists' letters, laboratory results, etc; about 50% of GPs provided such extra documents.

The questionnaire that was sent to the GP reported symptoms and diagnoses as presented by the patient during the telephone interview and included the following questions: 'Did this patient consult you with the reported symptoms and if so, when?'; 'Do you relate the symptoms to the disaster?'; 'Why (not)?'; 'Were the symptoms converted into a

diagnosis?'; 'Can you confirm this diagnosis?'; 'When was this diagnosis made?'; 'Was the diagnosis related to the disaster?'; 'Why (not)?'

Measurement and measures

Telephone interviews. Trained interviewers used an adapted version of the International Classification of Primary Care (ICPC) to classify the symptoms.[3,5]

GP questionnaires. For the first question ('Are the reported symptoms known to the GP?') four time frames were distinguished retrospectively, i.e. before the disaster took place (before October 1992) and three periods after the disaster took place (October 1992–1994; October 1995–1997; and October 1998–1999).

For the second question ('Do you relate the reported symptoms to the disaster?') the GP was requested to indicate, on a three-point scale, whether a relationship between symptoms (and/or diagnoses) and the disaster was considered realistic (1 = unrealistic; 2 = possible; 3 = (very) realistic). The contents of the plane cargo had not yet been disclosed at the time of data collection.

Analyses. Information from the call centre and the GP medical records survey were summarised with descriptive statistics, using SPSS.[6] Baseline differences and differences in reported symptoms between responders contacting the telephone enquiry line and those involved in the GP records survey were tested using the χ^2 test.[3]

Results

Were the reported symptoms noted in GP's medical records?

Informed consent was received from 621 (73%) responders out of 846 contacting the call centre. Four GPs were not found and 30 GPs did not respond. Finally, 553 (89% of those who gave informed consent) questionnaires were received from 345 GPs scattered all over the country, with a concentration in Amsterdam. A comparison of baseline variables between those responders whose medical records were examined and those whose records were not, revealed no difference in distribution of sex, age, and country of origin (data not shown). Responders (48%) were more frequently rescue workers than non-responders (37%, $P<0.05$) and less often lived in the destroyed apartments (35% versus 43%, $P<0.05$ [data not shown]). Responders (42%) more often reported psychological problems and problems of the nervous system (25%) than non-responders (34% and 14% respectively, $P<0.05$ for both comparisons [data not shown]).

The 553 responders reported in total 2358 signs and symptoms (average 4.3 symptoms per responder). Of these, 2211 (94%) could be used for statistical analysis. In the other 6%, analysis was not possible owing to incomplete information from the GP. The majority of signs and symptoms ($n = 1636$ [74%]) had been reported to the GP (Table 1). Fatigue, skin symptoms, feeling anxious or nervous, dyspnoea, and backache were the most frequently reported (80% or more had been reported to the GP). Of the 10 most frequently

Table 1. Ten most frequently reported symptoms to the call centre, the percentage of responders who reported these symptoms to the GP (n = 553 responders), and the percentage probably related to the disaster as judged by the GP (n = 2211 reported symptoms).

Symptom	Percentage of responders (n = 553) reporting symptom to call centre[a]	Percentage of responders with this symptom who reported it to their GP	Percentage of symptoms probably related to disaster according to GP[b]
Tiredness, fatigue	45	80	3
Headache	18	73	6
Sleeping problems	16	70	23
Dyspnoea	15	79	3
Concentration disorder	14	83	3
Dry skin	13	81	15
Memory disorder	13	53	16
Feeling anxious, nervous	12	81	18
Cough	9	75	0
Backache	9	80	3

[a]It was possible for patients to have more than one symptom — the average symptom score was 4.3; [b]Scored as '(very) realistic' on a three-point scale indicating the assumed association between diagnosis and disaster (1 = unrealistic, 2 = possible, 3 = [very] realistic).

reported symptoms to the call centre, memory disorder was the least known to the GP (53% of cases reported to the GP [Table 1]). Of all the symptoms reported to the call centre, hyperventilation, digestive symptoms, and neurasthenia were most frequently reported to the GP (Table 2). In contrast, instability of weight (gain or loss), hoarseness, frequent fever, and common cold were the least frequently presented symptoms to the GP (Table 2).

How long have these symptoms been known to the GP?

The time of onset was known in 1456 (89%) out of 1636 symptoms reported to the GP. One out of nine symptoms, attributed to the disaster by the patients, was reported to the GP before the disaster took place (especially cardiovascular symptoms, anxiety, and nervousness [Table 3]). Most symptoms (74%) were reported between October 1992 and 1998, while 15% were reported to the GP in 1998/1999 (mainly symptoms of the cardiovascular and musculoskeletal system [Table 3]).

GP's translation from reported symptoms to diagnoses

In 553 patients, GPs interpreted 2211 presented symptoms into 862 diagnoses, here analysed for the six most frequently reported symptoms (Table 4). This analysis made clear that a symptom can be associated with several diagnoses, but frequently the diagnosis could not be specified (medically unexplained physical symptoms [MUPS]). Fatigue could, in addition to being unspecified in most cases, also lead to diverse diagnoses, such as depression in 5% of cases, upper respiratory tract infection, and diabetes mellitus in 1% of cases. Headache was presented as a symptom of stress, as well as of sinusitis. Dyspnoea was related not only to asthma/chronic obstructive pulmonary disease (18%) and allergy (2%), but also to hyperventilation (6%).

One-third of the patients (33.8%) showed one or more of the ten most frequent diagnoses (data not shown). Depression (6.7%) and post-traumatic stress disorder (PTSD) (5.2%) were most frequently diagnosed. Neurasthenia (4.7%), muscle pain (3.1%), hyperventilation (3.1%) and tension headache (2.9%) appear in the ten most

frequent diagnoses in this study (data not shown), while it is usually less frequently diagnosed in general practice.

Did the GP relate reported symptoms and diagnoses to the disaster?

Only 6% of all 2211 reported symptoms was related to the disaster by the GP (data not shown). Although fatigue was expressed by 45% of the patients, the GP related this in only 3% of cases to the disaster (Table 1). Coughing, reported by 9% of responders, was never related to the disaster. For sleeping problems, reported by 16% of the patients, the percentage related to the disaster was much higher (23%).

Only a few diagnoses were frequently related to the disaster (Table 5); PTSD and acute stress were, not surprisingly, the most frequent. Highly incident diagnoses of the musculoskeletal system and skin were rarely related to the disaster.

What were GPs' reasons for relating symptoms or diagnoses to the disaster?

Where GPs related a symptom or diagnosis to the disaster, the time of diagnosis was the most important reason for this (data not shown).[3] In particular, when the symptoms were presented before the disaster took place or with a long delay after it took place (at the time of high media attention during the Parliamentary Inquiry), a direct relationship with the disaster was thought to be highly unrealistic. When the GP did not relate a diagnosis to the disaster, he was questioned about other specific causes. In 46% of cases the GP mentioned other psychosocial causes: in 13% an existing somatic disease; in 30% no clear cause; and in 8% a personality trait (data not shown).[3]

Discussion

Three-quarters of symptoms reported to the call centre were also found in GPs' medical records. A quarter of these were reported before the disaster took place, or six or more years after — coincident with much media attention at the time of the parliamentary inquiry. Symptoms that existed before the disaster took place may have been aggravated by the disaster. However, a direct relationship with the disaster seems unlikely. Most symptoms did not fit into a clear diagnosis

Table 2. Comparison between the 20 most frequently and 20 least frequently reported symptoms to the GP, as a percentage of the number reported to the call centre (n = number of responders, mean = 74%).

Symptom most reported to GP	% reported	n	Symptom least reported to GP	% reported	n
Hyperventilation	100	8	Declined vision	64	14
Leg symptom	100	21	Blurred vision	64	14
Abdominal cramp	94	17	Painful skin	63	8
Heartburn	92	13	Lacrimation	63	16
Neurasthenia	89	9	Loss of appetite	60	5
Red eye	89	9	Loss of hair	58	19
Painful eye	89	9	Excessive transpiration	57	14
Frequently ill	89	9	Symptom elbow	56	16
Sore joints	87	44	Vitiligo	54	22
Stomach ache	87	16	Foot symptom	54	11
Hip symptom	86	7	Ankle symptom	54	13
Hypertension	86	14	Eye itching	54	13
Vomiting	86	14	Allergy	53	15
Rash	83	6	Memory disorder	53	72
Concentration disorder	83	6	Common cold	52	21
Paraesthesia in fingers and/or feet	83	6	Facial neuralgia	50	6
Depressive feelings	82	34	Weight loss	43	7
Wrist symptom	82	11	Recurrent fever	43	7
Dry skin	81	72	Hoarseness	38	8
Feeling anxious, nervous	81	63	Weight gain	33	6

Table 3. Types of symptoms and time of first presentation to the GP (n = 1456 with symptoms).

Symptom category	Number with symptoms	Before 1992 (%)	1992–1994 (%)	1995–1997 (%)	1998 or later (%)
General somatic symptoms	255	11	31	43	15
Fatigue	182	9	33	42	16
Symptoms in digestive tract	96	10	32	42	16
Eye symptoms	55	9	44	42	5
Cardiovascular symptoms	35	17	29	31	23
Musculoskeletal symptoms	251	14	24	42	20
Neurological symptoms	105	14	29	39	18
Psychological symptoms	271	11	40	37	12
Feeling anxious, nervous	47	17	41	38	4
Concentration disorder	45	7	42	36	15
Sleeping problems	46	11	37	35	17
Respiratory symptoms	188	12	36	40	12
Dyspnoea	60	12	35	40	13
Skin symptoms	140	6	34	49	11
Dry skin	56	4	38	48	10
Other symptoms	60	4	41	46	9
Total	1456	11	33	41	15

and could be classified as MUPS. PTSD was frequently related to the disaster by GPs, but in general there was a high discrepancy between patients and GPs in attributing symptoms and diagnoses to the disaster.

In literature concerning people experiencing a disaster or an individually significant trauma, it is reported that 10% develop PTSD.[7-9] Although symptoms may decrease in the course of time, even years after a disaster, some of the victims may exhibit full-blown PTSD.[7,10,11] In the National Comorbidity Survey, an average lifetime prevalence of 8% for PTSD was reported, with a higher prevalence among women and divorced persons. A high comorbidity of depression, addiction, and personality disorders was reported as well.[12] Studies concerning aeroplane disasters, such as those at Lockerbie (1988) and Faro (1992), reported high prevalences of PTSD in the years following the disaster.[13-15] Types of symptoms and impact on life appeared to be the same in all age groups.[14] Earlier research concerning the

disaster at Bijlmermeer also revealed a high incidence of PTSD during the first year after the disaster; with 26% exhibiting complete PTSD and 44% having partial PTSD among eye witnesses and others involved, six months after the disaster.[16,17] A direct comparison with the 5.2% found in the present study six years after the crash is not valid, as the study population is not comparable. Nevertheless, the high rate of depression and PTSD in our study, even years after the crash, is consistent with the literature.

A limitation of our study is the self-selection of patients. Everybody who considered himself or herself a victim of the crash, who experienced symptoms and attributed these to the crash, was allowed to call and was accepted for the study. No responders without symptoms were participating in the study. By design, the study population was one in which they all had symptoms, which limits comparison with other primary care surveys. A comparison with the Dutch National Survey confirms the high rate of psychosocial

Table 4. For the six most frequently reported symptoms: most frequently associated diagnoses as percentage of the number of patients reporting the symptom.

Symptom	Number patients	Diagnosis by the GP	%
Fatigue	251	Depression	5
		Neurasthenia	4
		Problems at work	2
		Other viral diseases	2
		Upper respiratory tract infection	1
		Diabetes mellitus	1
Headache	100	Tension headache	14
		Crisis, acute stress	3
		Sinusitis	3
		Headache	2
		Migraine	2
		Other diseases of respiratory tract	2
Dyspnoea	85	Asthma	12
		Emphysema, COPD	6
		Hyperventilation	6
		Allergy	2
Sleeplessness	88	PTSD	6
		Anxiety, nervousness, tension	2
		Neurasthenia	2
		Problems at work	2
Concentration disorder	77	PTSD	4
		Depression	3
Dry skin	73	Contact eczema, other eczema	19
		Dermatophytosis	10
		Constitutional eczema	6
		Seborrhoic eczema	4
		Other diseases of skin/subcutis	4

PTSD = post-traumatic stress disorder; COPD = chronic obstructive pulmonary disease.

Table 5. Ten diagnoses (from disorders diagnosed more than four times) most suspected of being related to the disaster according to the GP's perception (as scored on a three-point scale indicating the assumed association between diagnosis and disaster: 1 = unrealistic; 2 = possible; 3 = [very] realistic).

Diagnosis	(Very) realistic (%)	Possible (%)	*n*
PTSD	72.4	20.7	29
Acute stress	28.6	35.7	14
Disease of oesophagus	20.0	20.0	5
Anxiety disorder	16.7	33.3	6
Depression	16.7	27.8	36
Tension headache	13.3	40.0	15
Other social problems	12.5	25.0	8
Other skin problems	11.1	33.3	9
Emphysema/COPD	9.1	63.6	11
Problems with working conditions	7.7	15.4	13

PTSD = post-traumatic stress disorder; COPD = chronic obstructive pulmonary disease.

symptoms in our study. Depression, PTSD, hyperventilation, and tension headache — all in the ten most frequent diagnoses of our study — are not in the ten most prevalent diagnoses of the National Survey.[18]

Patients' beliefs about their symptoms are powerful influences on their decision to consult a doctor. It influences the frequency of consultation and the way in which the problem is presented.

Patients' consulting behaviour in general practice before the plane crash took place could not be analysed, owing to the study's design. In the literature, there was an increased number of GP consultations in the 15 years before develop-ment of chronic fatigue syndrome was found, suggesting that behavioural factors have a role in its aetiology.[19] Another study comparing self-reported screening questionnaires and clinical opinion also confirms that, in general, the greater the number of symptoms a patient reports, the less likely it is that they can all be owing to somatic disease.[20] Total symptom scores are therefore likely to be associated with somatisation for a population.

Many of the reported symptoms and diagnoses in this study would fit in the MUPS and/or functional somatic syndrome (FSS) categories.[21] Muscle pain, hyperventilation, tension headache, and irritable bowel syndrome were

G A Donker, C J Yzermans, P Spreeuwenberg and J van der Zee

among the 20 most frequent diagnoses made by GPs. MUPS and FSS share similar phenomenologies and high rates of co-occurrence. Multifactorial aetiology has been demonstrated.[22] The suffering of patients with FSS is exacerbated by a self-perpetuating, self-validating cycle, in which common, endemic somatic symptoms are incorrectly attributed to serious abnormality, reinforcing the patient's belief that he or she has a serious disease.[21] The climate surrounding functional somatic syndromes includes sensationalised media coverage, the mobilisation of parties with a vested self-interest in the status of functional somatic syndromes, litigation, and a clinical approach that overemphasises the biomedical and ignores psychosocial factors. All these factors played an increasing role in our study population during the years preceding this study.

This study is not a follow-up study six years after a plane crash, but applies to those patients who reported symptoms that they attributed to the plane crash six years after. People have a need to predict the future and to control events, so that in the event that they are exposed to uncontrollable and unpredictable events they are strongly motivated to explain why the event and/or why their symptoms occurred.[23,24] Causal attribution is the central cognitive mechanism involved in the attempt to establish and maintain self-esteem, as well as perceptions of the world as predictable and controllable.[25] Even if causal attributions are not responsible for the onset of symptoms, they may be responsible for their maintenance. Differences in attributional styles between patients may lead to differences in coping behaviour.[26-28] The high rate of psychological distress in this population has been reported elsewhere.[29] Other studies also confirmed that the level of post traumatic distress is not directly related to the degree of trauma exposure.[3,30] The present study confirms that three-quarters of symptoms attributed to the disaster have been reported to the patient's GP. The challenge for GPs is to recognise the patient's attributional style and, while maintaining a good relationship with their patient, to support coping behaviour by switching from continuing the search for the cause of symptoms to concentrating on the impact these symptoms have on the patient's life.[31,32]

References

1. Gersons BPR, Carlier IV. Plane crash crisis intervention: a preliminary report from the Bijlmermeer, Amsterdam. *Crisis* 1993; **14(3):** 109-116.
2. Butcher JN, Dunn L. Human responses and treatment needs in airline disasters. In: Gist R, Lubin B (eds). *Psychological aspects of disaster*. New York: Wiley & Sons 1989.
3. IJzermans CJ, van der Zee J, Oosterhek M, *et al*. *Gezondheidsklachten en de vliegramp Bijlmermeer. Een inventariserend onderzoek.* [Health symptoms and the Bijlmermeer plane crash: post-traumatic reactions in a family practice.] Amsterdam, Academic Medical Center/Utrecht, NIVEL, 1999.
4. Yzermans CJ, Zee J van der, Donker GA, *et al*. Health problems in the aftermath of a plane crash. 2001. [Submitted for publication.]
5. Lamberts H, Woods M. *International Classification of Primary Care.* Oxford: Oxford University Press, 1987.
6. Norusis MJ. *SPSS/PC+ V2.0 Base Manual*. Gorinchem: SPSS International BV, 1990.
7. Bromet E, Dew MA. Review of psychiatric epidemiologic research on disasters. *Epidemiol Rev* 1995; **17(1):** 113-119.
8. Palinkas LA, Petterson JS, Russell J, *et al*. Community patterns of psychiatric disorders after the Exxon Valdez oil spill. *Am J Psychiatry* 1993; **150:** 1517-1523.
9. Breslau N, Davis GC, Andreski P, *et al*. Traumatic events and post traumatic stress disorder in an urban population of young adults. *Arch Gen Psychiatry* 1991; **48:** 216-222.
10. Noij EK. *The public health consequences of disasters*. New York: Oxford University Press, 1997.
11. Rubonis AV, Bickman L. Psychological impairment in the wake of disaster: the disaster-psychopathology relationship. *Psychol Bull* 1991; **109(3):** 384-399.
12. Skodol AE, Schwartz S, Dohernwend BP, *et al*. PTSD symptoms and comorbid mental disorders in Israeli war veterans. *Br J Psychiatry* 1996; **169:** 717-725.
13. Brooks N, McKinlay W. Mental health consequences of the Lockerbie disaster. *J Trauma Stress* 1992; **5(4):** 527-543.
14. Livingston HM, Livingston MG, Brooks DN, McKinlay WW. Elderly survivors of the Lockerbie air disaster. *Int J Geriatric Psychiatry* 1992; **7:** 725-729.
15. van Duin MJ, Overdijk WIE, Wijkhuis LJJ. *De Faro-ramp: over-levenden en nabestaanden aan het woord*. [The Faro crash: inquiry among survivors and relatives.] Interim report, The Hague, Crisis Research Team, 1998.
16. Meijer JS. Een jaar na de vliegramp in de Bijlmermeer; posttraumatische reacties in een huisartspraktijk. [One year after the Bijlmermeer plane crash: post-traumatic reactions in a family practice.] *Ned Tijdschr Geneeskd* 1992; **136:** 2553-2558.
17. Carlier IV, Gersons BPR. Stress reactions in disaster victims following the Bijlmermeer Plane Crash. *J Trauma Stress* 1997; **10(2):** 329-335.
18. Foets M, van der Velden J, van der Zee J. *Morbidity and intervention in general practice. A cross-national survey in The Netherlands.* Utrecht: NIVEL, 1986.
19. Hamilton WT, Hall GH, Round AP. Frequency of attendance in general practice and symptoms before development of chronic fatigue syndrome: a case control study. *Br J Gen Pract* 2001; **51:** 553-558.
20. Peveler R, Kilkenny L, Kinmonth AL. Medically unexplained physical symptoms in primary care: a comparison of self-report screening questionnaires and clinical opinion. *J Psychosom Res* 1997; **42(3):** 245-252.
21. Barsky AJ, Borus JF. Functional somatic syndromes. *Ann Int Med* 1999; **130(11):** 910-921
22. Mumford DB, Devereux TA, Maddy PJ, Johnston JV. Factors leading to the reporting of 'functional' somatic symptoms by general practice attenders. *Br J Gen Pract* 1991; **41:** 454-458.
23. Weiner B. Spontaneous causal thinking. *Psychol Bull* 1995; **97:** 74-84.
24. Wong PTP, Weiner B. When people ask 'why' questions, and the heuristics of attributional research. *J Pers Social Psychol* 1981; **40:** 650-663.
25. Joseph S, Williams R, Yule W. Evidence for an integrative model of adjustment. In: *Understanding post-traumatic stress. A psychosocial perspective on PTSD and treatment*. Chichester: John Wiley & Sons, 1998.
26. Turnquist DC, Harvey JH, Anderson BL. Attributions and adjustment to life-threatening illness. *Br J Clin Psychol* 1988; **27:** 55-65.
27. Tennen H, Affleck G. Blaming others for threatening events. *Psychol Bull* 1990; **108:** 209-232.
28. Joseph S, Yule W, Williams R. Post-traumatic stress: attributional aspects. *J Trauma Stress* 1993; **6:** 501-513.
29. Yzermans J, Donker GA, Becker H, Oosterhek M. Psychological symptoms six years after a plane crash. 2001; submitted for publication [Author: published yet?].
30. Schuster MA, Stein BD, Jaycox LH, *et al*. A national survey of stress reactions after the September 11, 2001 terrorist attacks. *N Engl J Med* 2001; **345(20):** 1507-1512.
31. Kessler D, Lloyd K, Lewis G, Gray DP. Cross-sectional study of symptom attribution and recognition of depression and anxiety in primary care. *BMJ* 1999; **318:** 436-440.
32. van Hemert AM, Huijsman-Rubingh RRR, Smeets EC. Rampen en gezondheidsklachten. Essentieel is een goede relatie met de patiënt. [Disasters and health effects. A good relationship with the patient is essential.] *Medisch Contact* 2002; **57(4):** 141-144.