

Infrequent attendance in general practice after a major disaster: a problem? A longitudinal study using medical records and self-reported distress and functioning

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Objective. To assess the characteristics and implications for care of infrequent attendance in general practice in the aftermath of disaster.

Methods. A study of the content of electronic medical records (EMRs) in pre- and post-disaster periods linked to an enquiry using self-reported questionnaires administered 3 weeks and 18 months post-disaster. The disaster (explosion of a firework depot in Enschede, The Netherlands) caused 23 deaths, about 1000 people injured and 1200 people who had to relocate. Sample included survivors ($N = 922$) who participated in two surveys and whose data could be linked to EMRs of GPs. A comparison of reported morbidity in 'infrequent' (a maximum of three times in men and four times in women in the first two post-disaster years) and 'more frequent attenders' (frequency determined post-disaster) in general practice examined in relation to health status (measured by diagnoses in EMRs, symptom checklist and quality of life instrument) was the main outcome measure.

Results. Infrequent attenders reported approximately three times as few contacts as more frequent attenders in the pre-disaster year ($P < 0.001$). Multivariate logistic regression analyses revealed that infrequent attenders were likely to be younger, less depressed, have better subjective health and physical functioning and exhibited more hostile behaviour (measured by questionnaire). Infrequent attenders were less often personally bereaved by the disaster, but more often relocated, and had a lower prevalence of psychological problems pre- and post-disaster although this increased stronger (by 10-fold).

Conclusions. Both groups showed the same type of psychological problems post-disaster, but differed in the frequency of contacting the GP.

Keywords. Attendance, disaster, general practice, mental health, symptom checklist.

Introduction

Little is known about predictors of health care seeking behaviour and even less is known about these predictors after disasters.^{1,2} From trauma literature, it is known that increased mental health service use is related to being female, having a previous trauma history and having a post-traumatic stress disorder (PTSD) diagnosis.³ Some studies have shown that

post-disaster psychological symptoms are related to the increased use of post-disaster mental health services.^{4,5} Disaster research is often focused on victims with PTSD treated in mental health services.^{4–8} Fortunately, most survivors do not develop such serious conditions and do not receive specialized care. It is important to understand the natural history of symptoms and disorders in survivors, especially in those seeking management advice from their GPs.^{9–15} Some

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survivors attend infrequently after a disaster, but it is unknown if they were less exposed to the disaster or if other factors are more important. The present study explored which personal characteristics and exposure variables contributed to the prediction of post-disaster health care utilization, and whether psychological distress did so. The disaster studied involved an explosion in a firework depot within a residential area (Enschede, The Netherlands; May 13, 2000) which caused 23 immediate deaths, approximately 1000 injured and the relocation of 1200 people due to serious damage to their houses.

Methods

Design

This study combined information from two data sources: (i) a longitudinal investigation of diagnostic entries in the patient electronic medical records (EMRs) maintained by their GPs; and (b) self-completed questionnaires among affected residents and rescue workers administered 3 weeks (T1) and 18 months (T2) post-disaster.^{9,16,17}

Recording by GPs in EMRs, established 1 year pre-disaster, was maintained throughout and for the purpose of this study was limited to the first 2 years post-disaster. Survivors on the lists of these GPs were identified from self-reporting and the zip code of their home address at the time of the disaster.^{9,16} In the monitoring study, 73% of all GPs in the city of Enschede participated and together they covered 89% of the survivors, identified by both sources. Patients were informed about the participation of their GP in this monitoring study and could object to the use of their data (nobody did so). Data collection was performed in accordance with the privacy protection procedures of the Dutch Data Protection Authority. In the Dutch health care system, each citizen is registered on the list of only one GP, who must first be consulted if referral to secondary care is needed.

Data were collected using self-reported questionnaires from adult survivors (18 years and older).^{17,18} The second questionnaire was broadly similar to the first but excluded questions on immediate injuries. The questionnaire sampled population consisted of 2851 survivors who provided data at T1 and T2. The results of the enquiry at T2, 18 months post-disaster, were considered to reflect patients' coping process to a certain extent. Ethical approval for the study was given by the Medical Ethical Committee of the Netherlands Organization for Applied Scientific Research: all respondents signed an informed consent before participation. There were 922 persons for whom we obtained monitoring data from the EMR and who also completed questionnaires at T1 and T2. Compared with the survivors of the EMR monitoring study who did

not complete questionnaires ($N = 1929$), they were older (43.2 versus 37.6 years, $P < 0.001$) and more were female (54.4% versus 46.6%, $P < 0.001$) but they were similarly distributed with regard to health insurance.

Instruments

The general practice EMRs included information on gender, age, type of health insurance and clinical data on patient symptoms, examination findings, diagnoses and interventions registered in accordance with the International Classification of Primary Care, which is compatible with Diagnostic Statistical Manual of Mental Disorders (DSM-IV).^{19,20} Private health insurance indicates a higher income level and was used as an indicator for social economic status (SES).

The self-reported questionnaires included marital status and the highest educational level achieved. Persons were classified injured or not, relocated or not (due to serious damage to their house) and bereaved or not (loss of relative or friend). Psychological distress was measured using the Dutch adaptation of the Symptom Checklist-90-R (SCL-90-R) at T1 and T2.^{21,22} In the present study, results for these six subscales measured at T2 were used (anxiety, phobic anxiety, depression, somatization, hostility and sleep disturbance). A five-point Likert scale (1 = not at all and 5 = very much) was used to measure the severity of these symptoms in the preceding week. The validity and reliability of the Dutch SCL-90-R has proven to be satisfactory.²³

General health status was measured using a Dutch translation of the RAND36 Health Survey which included eight subscales.²⁴ An additional scale was used at T2 measuring reported change in health (one item). Scale scores were transformed to a 0–100 scale with higher scores indicating higher levels of functioning or well-being.

Data analyses

The definition of infrequent attendance was based on less than four consultations in the 2 years post-disaster in males and less than five consultations in females. Contacts related to pregnancy, delivery and preventive medicine (influenza vaccination and cervical smears) were excluded. Infrequent attenders also included non-attenders. The choice to use different criteria for men and women to define low attendance in general practice was based on Dutch reference data indicating that women have a higher average attendance than men, even after excluding attendance related to pregnancy, delivery and cervical smears.²⁵

For descriptive purposes, we compared the infrequent and the more frequent attenders on the 15 most prevalent clusters of diseases, pre- and post-disaster stratified by gender.

Multiple logistic regression analyses were performed to examine predictors for attendance frequency. The

independent variables (entered in one step) included socio-demographic characteristics (i.e. gender, age, insurance type, marital status, education level and immigrant status), exposure variables (injury, relocation and bereavement) and health variables of SCL-90 and RAND36 (as continuous variables per scale). In this way, we explored which personal characteristics and exposure variables contributed to the prediction of post-disaster health care utilization and whether psychological distress did so.

Results

Demographics and morbidity

The 'infrequent attenders' reported approximately three times as few contacts as the 'more frequent attenders' in the pre-disaster year ($P < 0.001$, Table 1). Infrequent attenders contacted their GPs twice as frequently in the first 2 years post-disaster as compared with their pre-disaster equivalent, but the pre- and post-disaster difference was even greater in more frequent attenders (by a factor 2.6, $P < 0.001$). In addition, infrequent attenders had less injuries and were less likely to be bereaved ($P < 0.01$ for both comparisons) but experienced more damage to the house ($P < 0.01$).

Infrequent attenders were younger and had a higher SES and education level ($P < 0.001$ for all comparisons).

Consistent with the higher attendance rate pre-disaster, the prevalence of disease in all clusters was also higher pre-disaster in the more frequent attenders (Table 2). Post-disaster, the prevalence of psychological problems presented at general practice was higher than all other disease clusters examined in both groups showing a stronger increase (by 10-fold) in infrequent attenders. The greatest difference pre-disaster between the two groups was in the prevalence of hypertension (less in infrequent attenders). Post-disaster, the diagnosis 'acute stress' was most prevalent in both groups, although the prevalence in infrequent

attenders was less than in more frequent attenders. Other psychological symptoms like insomnia and depression were less prevalent in infrequent attenders pre- and post-disaster.

Prevalence of psychological distress and general health status

Mean SCL-90 scores in each of the subscales were lower in male and female infrequent attenders indicating less psychological distress ($P < 0.001$ for each comparison between more frequent and infrequent attenders, Table 3). Mean RAND36 scores in each of the subscales were higher in male and female infrequent attenders indicating better social, physical and emotional functioning or well-being ($P < 0.001$ for each comparison, Table 4).

Multiple logistic regression analysis revealed that infrequent attenders were likely to be younger, more hostile and more likely to have been relocated (Table 5). In addition, they showed better self-reported health and physical functioning, were less likely to be bereaved or to feel depressed (as measured by questionnaire).

Discussion

This is the first study examining consulting behaviour following a disaster in which pre-disaster health-related information could be examined efficiently. We concentrated on the difference between infrequent and more frequent attenders in general practice among disaster survivors. The latter group included patients with an average attendance rate in general practice. Infrequent attenders also had a low attendance pre-disaster and experienced better self-reported health and physical functioning post-disaster. They tended to be younger, less often experienced bereavement and feelings of depression. Bereavement and relocation have been associated with increased use of primary care in disaster literature, findings which were not confirmed for relocated survivors in this study.^{2,9} The lower attendance rate of relocated survivors in our study could not be attributed to loss to follow-up as the study cohort only included survivors on GP lists for the total study period. Low education and marital status (being single), described as predictors of increased primary care utilization in a study not related to disasters, did predict increased attendance in univariate, but not in multivariate analyses in our study.²⁶ A surprising finding was the greater hostility of infrequent attenders in multivariate analyses in contrast to lower hostility scores in univariate analyses. Adjustment for several variables in the multivariate analyses may have caused this outcome. No literature was found to support greater hostility in infrequent attenders, so more research is necessary to explore this issue.

TABLE 1 *Characteristics of infrequent and more frequent attenders*

General Practice	Infrequent attenders	More frequent attenders	<i>P</i>
<i>N</i> = 922	<i>n</i> = 288	<i>n</i> = 634	
% Female	50.7	54.6	
Mean age in years (SD)	39.5 (14.2)	44.9 (15.6)	<0.001
Insurance public/private (SES)	2.2	4.4	<0.001
% Education middle + high	57.1	43.7	<0.001
% Injuries	18.1	28.9	<0.001
% Lost relative or friend	2.1	6.9	<0.001
% Damage to house	10.8	9.2	<0.01
No. of contacts/year pre-disaster	1.8	5.4	<0.01
No. of contacts/year post-disaster	3.6	14.0	<0.001

TABLE 2 Annual prevalences (per 1000 person-years) pre-disaster(1 year) and post-disaster (2 years) by attendance category

ICPC	Pre-disaster		Post-disaster	
	Infrequent ‰	More frequent ‰	Infrequent ‰	More frequent ‰
L—musculoskeletal system	217	1407	307	1765
R—respiratory system	119	774	165	970
S—skin	104	670	243	819
D—digestive system	70	704	97	929
P—psychological problems	36	534	368	2032
A—general	35	350	108	532
H—ear	34	358	43	291
K—cardiovascular system	33	807	57	1002
X—female genital system	30	213	73	318
N—neurological system	27	334	52	428
F—eye	26	227	40	205
T—endocrine system	14	358	12	483
U—urological tract	11	254	26	349
Z—social problems	10	125	14	304
Y—male genital system	7	82	14	80
B—haematological system	4	88	14	88
<i>n</i>	288	634	288	634

ICPC, International Classification of Primary Care.

TABLE 3 Mean SCL-90 scores and SDs in subscales 18 months post-disaster by attendance category (N = 922), stratified by gender

SCL-90 subscales	Infrequent attenders				More frequent attenders			
	<i>n</i> = 149		<i>n</i> = 158		<i>n</i> = 297		<i>n</i> = 355	
	Mean ^a male	SD	Mean ^a female	SD	Mean ^a male	SD	Mean ^a female	SD
Anxiety	14.1	6.4	16.0	7.4	18.2	9.5	21.0	10.5
Phobic anxiety	8.8	3.9	9.8	4.8	10.8	5.8	12.5	6.7
Depression	23.6	9.9	25.9	11.0	30.1	14.6	33.9	15.7
Somatization	17.5	7.2	19.4	8.8	22.9	10.5	25.5	11.4
Hostility	8.2	3.3	8.4	3.8	9.8	5.0	10.0	5.1
Sleep disturbance	5.3	3.0	6.0	3.2	7.0	3.7	7.5	3.8

^aDifferences in all subscales between infrequent and more frequent attenders <0.001.

TABLE 4 Mean RAND SF 36 scores and SDs in subscales 18 months post-disaster by attendance category (N = 922), stratified by gender

General practice	Infrequent attenders				More frequent attenders			
	<i>n</i> = 149		<i>n</i> = 158		<i>n</i> = 297		<i>n</i> = 355	
	Mean ^a male	SD	Mean ^a female	SD	Mean ^a male	SD	Mean ^a female	SD
Social functioning	77.9	23.0	74.3	23.4	65.8	26.5	62.3	28.2
Role limitation (physical)	71.4	32.3	66.2	35.9	58.4	35.3	52.7	38.5
Role limitation (social)	73.0	31.9	67.0	35.7	60.4	37.9	53.4	39.5
Pain	79.0	22.2	75.0	21.9	63.9	26.7	61.3	26.2
General health	64.6	21.4	63.3	20.0	52.9	20.7	49.2	22.5
Vitality	60.0	19.1	52.9	18.7	51.0	19.8	46.0	20.7
Mental health	69.3	18.1	66.2	18.1	61.2	19.3	56.0	21.1
Physical functioning	87.0	15.3	82.6	21.1	72.5	25.3	68.3	26.1

^aDifferences in all subscales between infrequent and frequent attenders <0.001.

TABLE 5 Odds ratios of multiple logistic regression analyses of infrequently versus more frequently attending victims

Variable in equation	OR	95% confidence interval	P
Female	0.93	0.67–1.29	
Age (per 10 years)	0.81	0.72–0.92	<0.001
Insurance public versus private	0.71	0.49–1.04	
Single versus couple	1.40	0.86–2.27	
Education (high/middle versus low)	0.93	0.65–1.33	
Immigrant versus non-immigrant	1.30	0.88–1.90	
Relocated	1.51	1.04–2.19	<0.05
Injured by disaster	0.65	0.41–1.04	
Lost relative or friend	0.29	0.12–0.74	<0.01
Anxiety	0.98	0.94–1.03	
Phobic anxiety	1.02	0.96–1.08	
Depression	0.96	0.93–0.99	<0.05
Somatization	0.98	0.94–1.02	
Hostility	1.12	1.04–1.21	<0.01
Sleep disturbance	1.03	0.96–1.11	
Social functioning	1.00	0.99–1.01	
Role limitation—physical	1.00	0.99–1.00	
Role limitation—social	1.00	1.00–1.01	
Pain	1.01	1.00–1.02	
Self-reported health	1.02	1.00–1.03	<0.05
Vitality	1.00	0.98–1.00	
Mental health	1.00	0.99–1.02	
Physical functioning	1.01	1.00–1.02	<0.05
Constant	5.46		<0.05

Research on the World Trade Center terrorist attack has shown that the psychological effects were not limited to those directly exposed. The degree of response was not predicted simply by objective measures of exposure to or loss from the trauma.^{27,28} When assessing the effects of disaster exposure, controlling for pre-disaster symptoms provides the best research design. The present study combined medical records and post-disaster surveys, offering a unique opportunity to study these effects. The lack of a control group of unexposed persons in the questionnaire-based surveys is a small limitation. Although a control group was available for the GP registration and the survey, these data were not collected in identical populations and could therefore not be matched. Nevertheless, we believe this study has resulted in the development of robust methods for studying the effects of a disaster.

Another methodological issue to be considered is the representativeness of the study sample. Although the study represents a large number of survivors, it is still a minority of the total number of survivors, namely those who participated in two surveys and who were included in the general practice sample. The demographic determinants of better response on the surveys were female sex, being middle aged or older, having a higher educational level and being native Dutch; these determinants of response were not different between the immigrant population and the native Dutch.¹⁷ The prevalence of health problems appeared to be hardly affected by the non-response rate when

the statistical technique of multiple imputation was applied.²⁹ More in-depth study of health- and disaster-related characteristics in relation to selective participation did not reveal selection bias in study outcome results post-disaster.³⁰ The group of survivors included in the general practice study represented 89% of the disaster survivors. Compared to non-participating survivors, those who were forced to relocate were slightly over-represented in the study, suggesting some selection bias towards severely affected survivors. Furthermore, women and the elderly were slightly over-represented in our study, but the socio-economic indices used in this study did not differ between participating and non-participating survivors.

Summarizing, the profile of infrequent attenders shows a group of survivors with less psychological and somatic health problems pre-disaster, younger, less hit by the disaster in terms of loss of relatives and friends, but more often relocated. Both groups showed acute distress as the most prevalent symptom post-disaster. The difference between the groups does not reflect a large difference in type of psychological morbidity post-disaster, but a difference in contact frequency to handle these problems.

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Declaration

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Conflict of interest: None.

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