REPORT ON THE PSYCHIATRIC SEQUELAE TO

THE STARDUST FIRE

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1. The Stardust Fire Disaster - Introduction.

1.1 Background

The early morning hours of Saturday, February 14th 1981 became a time of unexpected horror for an estimated 840 young people who were attending a disco in a nightclub in Dublin. The setting was the Stardust, in Artane. This building was a renovated jam factory which had been turned into a nightclub four years previously. Patrons were largely residents of the housing estates of the neighbourhood surrounding the nightclub: areas such as Bonnybrook, Coolock, Kilmore, Artane, Donnycarney and Edenmore. At the conclusion of a disco-dancing competition at 1.30 a.m. a fire was noticed in an area of banked seating in an alcove which had been curtained off. Some people, on seeing the fire moved towards the exits, a number of which although unlocked, had padlocks and chains draped across them, giving the impression that they were locked. Two others doors were obstructed by seats and skips containing empty bottles. The lights in the building failed four minutes after the fire had first been seen, resulting in panic. In the confusion many patrons found themselves trapped in the toilets, the windows of which had been sealed with metal lining to prevent the transfer of drink, drugs or other articles in either direction. Highly inflammable tiles on the walls and ceiling contributed to the speed with which the fire engulfed the ballroom. Five minutes after the failure of the lights the contents of the

ballroom were on fire. By the time the first fire engine arrived the fire had begun to diminish. The Fire Brigade experienced some difficulty in locating water hydrants and also lacked essential equipment to force access to the building. Fortunately the majority of people made a timely escape from the burning building and firemen managed to rescue many of the injured or trapped.

The bodies of 40 young people were removed from the building by the rescue services and brought directly to the Dublin City Morgue. Four victims were brought to hospital for resuscitation but were found to be dead on arrival. Four more victims died subsequently in hospital, 4, 5, 11 and 25 days after the fire respectively, bringing the death toll to 48 (Report of the Tribunal of Inquiry on the Fire at the Stardust, Artane, Dublin, on the 14th February, 1981). For the involved relatives a harrowing time ensued as they attempted to locate their offspring in the city hospitals and for some, in the Dublin City Morgue. A list of the injured was compiled in each hospital but this took time to be generally available and in some instances was incomplete. A temporary morgue was erected by the Army Medical Corps and the City Coroner's Office was turned into a reception area. An inspection of bodies was only allowed after 10 a.m. the morning after the fire and for some relatives identification was not possible because of extensive burns.

Two hundred and thirty seven people were listed as having been brought to hospital of whom 124 were detained at least overnight and 113 were treated in casualty and discharged home within hours.

1.2 Response to the fire.

All except three of the dead were from the north city area (Appendix A). The dead included a sister and two brothers from one family, two sisters from another and a married couple. Thus there were 45 bereaved families. On the 15th February, the government announced that a public inquiry would be held into the disaster to be chaired by Mr. Justice Ronan Keane. A disaster fund was established by the government to provide financial aid for the bereaved families and the injured. In the days immediately following the fire, a group of relatives got together to form a relatives committee.

As an immediate response general practitioners, public health nurses and social workers visited the homes of families of those affected by the disaster who were known to them. Responding to the distress of the relatives visiting those referred to it's service, the Mater Hospital authorities arranged for members of staff to visit families in the area.

The majority of those affected resided in Dublin North East and North County catchment area. The Child Psychiatric Centre at the Mater Hospital which provides services to the area, arranged for visits to the local schools where they offered advice in regard to preventitive programmes and assistance as required for those affected.

The course of action to be followed by the adult psychiatric services was decided at a senior staff meeting on the 16th February

1981. The operation of the policy formulated required that the response be organised on a low-key basis, especially in the initial stages. The rationale behind this approach was to maximise the bionomic compensatory mechanisms which tragedies of this type evoke within a community and which are recognised as the most potent factors in the healing process. As needs became apparent or various agencies were found to need support, assistance would be provided or help sought. This entailed liaison, support and information-sharing between staff of the psychiatric services and key figures in the community, who had most direct contact with those affected by the tragedy. A number of meetings were held jointly with (i) the two Catholic bishops of the local deaneries and parish priests of the area;

(ii) local general practitioners, which drew a large response; (iii) representitives of the Community Care programme for areas 7 and 8, including their public health nurses.

A consultant psychiatrist was appointed to coordinate the Eastern Health Board's response. It was agreed that St. Francis' Day Hospital, Raheny, would act as the base for these activities. Advice was sought from acknowledged experts who had been involved in the aftermath of the Aberfan and other disasters. Facilities for specialist consultation and help were made available on a regular basis for individuals and families immediately involved. Two Community Psychiatric Nurses were appointed to provide back-up support and the psychiatric social worker for the area was encouraged to play an active but unobtrusive role.

The area in which the majority of the dead and injured lived consisted largely of houses built by Dublin Corporation 10 - 15 years previously, mostly for families from the inner city area. The percent of the population aged under 25 years of age was well above the national average as were rates of unemployment (Central Statistics Office, 1981).

The immediate problems encountered were of a social and practical nature. These included facilitating hospital attendence, funeral arrangements and providing financial assistance where necessary.

1.3 The origins of the study

A committee was established by the Eastern Health Board to conduct a study to consider the implications of the Stardust fire for the services which the Board provides. The committee comprised representatives of the Eastern Health Board Special Hospital and Community Care Programmes, the Department of Health, the Medico-Social Research Board (now the Health Research Board), the Mater Hospital and An Foras Taluntais. The committee decided that it's goal would be best achieved by setting three objectives, each of which would be carried out and reported on separately. These would be compiled into one overall report. These objectives were: -

(i) To outline the background of the Stardust disaster and to describe from official records the physical consequences for the people involved in the disaster.

(ii) To collect data on the psychiatric consequences of the

disaster for the bereaved families and the injured.

(iii) (a) To examine and describe the social impact of the disaster on the affected community, and (b) identify any problems arising and suggest appropriate responses in the event of a further major disaster.

There was a degree of overlap between the three objectives which were seen as fitting into three separate researcher roles. This report arises out of the second objective i.e. the psychiatric consequences of the disaster.

1.4 Disasters in Ireland prior to the Stardust fire

The overall study is unique in that it represents the first attempt in Ireland to study the consequences of a disaster for the people directly involved. There have been several disasters in Ireland in this century. These include: the deaths of 35 children in a fire in Cavan in 1927; a cinema fire in Drumcollogher, Co. Limerick in 1943 which resulted in 48 deaths; car bomb blasts in Dublin and Monaghan in 1974 in which a total of 33 people died; the Betelgeuse oil tanker explosion in Bantry Bay, Co. Cork in 1979 which resulted in 50 fatalaties; train crashes at Buttevant, Co. Cork in 1980 and Cherryville Junction, Co. Kildare in 1983 which resulted in 19 and 7 deaths respectively (Table 1).

Table 1: Irish Disasters.

Date	Location	Description	Fatalities
1927	Cavan	Fire	36
1941	Dublin	Bombing	50
1943	Co Limerick	Fire	48
1968	Irish Sea	Plane crash	61
1972	Dublin	Fire	8
1974	Dublin &	Car bombs	28
	Monaghan		5
1979	Whiddy Is.,	Oil tanker	50
	Co Cork.	explosion	
1980	Co Donegal	Fire	10
1980	Co Cork	Train de-railed	19
1981	Dublin	Fire	48
1983	Kildare	Train crash	7

As far as it can be ascertained no attempt was made to examine systematically or otherwise the consequences of these disasters for the people directly involved. The only study conducted in Ireland on a disaster prior to the Stardust disaster was a study conducted by staff located at Mallow County Hospital which described the role played by that hospital in the aftermath of the Buttevant rail crash and the manner in which it dealt with the injured (Gaffney

& Coughlan 1981). Therefore, in planning the Stardust fire study it was neccessary to look at disaster research abroad.

1.5 Approach to Disaster Research

The purpose of the Stardust fire study is to examine and describe the psychological and psychiatric effects on the population directly involved, including an appraisal of the type and duration of the grief reaction experienced by the bereaved families. It is also the intention to provide data which could be of assistance in planning the responses of the health services in dealing with psychiatric problems should a similar disaster occur.

1.5.1 Dimensions of disasters

Increased understanding of the effects of a disaster may be achieved by identifying a number of basic dimensions which are common to all such occurrences. Four dimensions have been suggested which may determine the overall effect of a disaster (Barton 1969). These are:- (i) Scope of the impact i.e. geographical scope, number of people involved; (ii) Speed of onset i.e. sudden or gradual; (iii) Duration of the impact i.e. single or repeated episodes; (iv) Social preparedness of the community e.g. weather forecast of impending hurricane.

Another scheme of describing disasters contains five dimensions

(Berren et al 1982), overlapping and developing Barton's classification: (i) Type of disaster i.e. man-made or natural;

(ii) Speed of onset i.e. sudden or gradual;

(iii) Degree of personal involvement;

(iv) Potential for re-occurrance;

(v) Control over future impact.

It has been suggested that because a responsible agent can be identified, more guilt, blame, hostility and other health problems result from man-made disasters than following on natural disasters (Logue et al 1981).

The scope of a disaster, determining the extent of community involvement is important (Green 1981). This has been described as: (i) "peripheral" - a disaster happening to a group of people who come together by chance e.g. aeroplane crash where survivors return to communities where the physical setting and the social support networks remain intact;

(ii) "intermediate" - a disaster involving a group of people within a community e.g. factory explosion affecting the whole community in some way but where there are still unaffected members and where the physical structures remain the same;

(iii) "central" - a disaster changing the physical and social structure of the community e.g. floods, resulting in homes being destroyed and people forced to relocate.

The Stardust fire can be classified as man-made as distinct from a natural disaster affecting a defined, unprepared community. Taking bereaved families, injured and non-injured survivors, staff

members of the Stardust complex and members of the rescue services into account approximately 1,000 - 1,500 people were affected by the Stardust fire. The disaster occurred virtually without warning and lasted for approximately 15 minutes. Using Green's (1981) peripheral/intermediate/central dimension, the Stardust fire falls somewhere between the peripheral and intermediate categories. It is peripheral in the sense that it involved a group of people who came together by chance. However, as the victims and survivors came from the same locality, a particular community was involved and thus the disaster may be classified as intermediate. Although it is difficult to find exact comparisons, a number of disasters share many similar features. Unfortunately data in regard to these is scarce. In the Cocoanut Grove fire (Cobb & Lindemann 1943; Adler 1943) there were few survivors and a very high mortality. Examination there concentrated on individual aspects of psychopathology rather than on group differences. In the Beverly Hills Supper Club fire only a tiny minority (n = 147) of the total 2,500 people who were involved in the fire were examined (Best 1977), and although a number of predictive indices of later psychiatric impairment were isolated, it is difficult to extrapolate acurately from such a small sample. A disaster almost identical to the Stardust fire occurred near Grenoble, France in 1970. One hundred and forty two teenagers from one village died in a disco fire, the high mortality being due to locked exit doors. No research study on this fire has been published. A more recent tragedy was that in Bradford where 54 people died and approximately

100 were injured when a viewing stand went on fire at Bradford City football ground in 1985.

The clinical parameters to be measured, and their interpretation do not differ greatly according to the nature of the disaster. A feature of most disaster studies is the low percentage of those affected on whom data are collected and the widely varied sampling methods used. Interpretation of results from non-representitive samples is fraught with error. For this reason a major effort was made to include as many of those directly affected by the Stardust fire as possible.

1.6 Approach to present study

The focus in the Stardust fire study was on broad samples. Anticipated were morbid reactions in three groups: bereaved, injured and survivors. There was less attention to the individual response and more emphasis on conspicuous group responses. Estimates of the number of people who were most at risk and the experiences, vulnerabilities and demographic features affecting their outcome was sought.

The lack of agreement on established principles upon which to structure disaster research, and the absence of an agreed yardstick against which results can be compared, gives rise to problems. Nonetheless some clear guidelines can be laid down and have been adhered to in this study:- (i) The study sample was clearly defined and also the population from which it was drawn.

(ii) Standard screening tests were employed to define psychiatric impairment.

(iii) Time periods within which psychiatric impairment was measured was defined in order to place the results in the context of the total disaster.

(iv) As large and inclusive a number of those affected were examined, as global estimates of impairments in disasters have to the present been unreliable due to poorly selected sampling.

(v) Questions in regard to legal and compensation issues were structured in such a manner as to avoid bias.

2. Stardust fire study - Methodology

2.1 The four groups studied

2.1.1 The bereaved relatives

Forty eight young people ranging in age from 16 - 26 years died in the Stardust fire. A list of names of their next-of-kin was available from the Gardai. There was a total of 45 families and these were contacted.

It was planned to interview the parents and siblings aged over 16 years in these 45 families. Eight families refused any interviews. Five of the parents of victims, four fathers and one mother were deceased prior to the Stardust fire disaster. Two parents, a mother and a father died in the period intervening between the occurrence of the disaster and the time of interview, the former in March 1981 and the latter in February 1982. Six of the bereaved mothers were separated from their husbands and in all cases the exact location of the husband was unknown. This left a total of 77 bereaved parents of whom 29% (22/77) refused to participate in the survey. Thus 55 parents (34 mothers, 21 fathers) were interviewed. One woman widowed in the Stardust fire was interviewed and is included for subsequent analysis with the bereaved parents.

There was a total of 143 siblings aged over 16 years in the 45 families; 26% (37/143) refused interview and 10% (15/143) were

uncontactible. Thus 91 adult siblings (39 sisters, 52 brothers) were interviewed.

The total number of bereaved relatives aged over 16 years interviewed was 147 (55 parents, 1 widow and 91 siblings) (Table 2).

2.1.2 The Hospitalised

A total of 124 persons had been hospitalised for over 24 hours. Eight people refused interviews and 18 could not be located. Thus the total number of persons interviewed was 98 (Table 2).

2.1.3 The Casualty-treated

According to hospital lists, a total of 113 people required hospital treatment but were not detained there overnight. Of these six refused interview and 12 could not be located, leaving 95 people for interview (Table 2). In the course of interviewing 50 attenders (see below), six of these were discovered to have had casualty treatment after the fire and were included in the casualty-treated group. Thus the total number of persons interviewed was 101.

2.1.4 The Attenders

From the Gardai lists of the remaining 600 young people who

attended the Stardust nightclub on the 14th February 1981 and escaped unhurt, 50 were selected by random numbers and an interview requested. Five of those originally selected refused to participate and one other could not be located. These were replaced by six more people selected in a similar manner. Thus 50 people were interviewed.

Table 2: Response rate of participants in the Stardust fire study

Category	Interviews	(% of total)
Bereaved relatives	147	67%
(i) parents	56	71%
(ii) siblings	91	64%
Hospitalised	98	79%
Casualty-treated	101	85%
Attenders	50	Not applicable

Although the bereaved respondents formed a clearly defined group by virtue of the loss of a family member in the Stardust fire, 15% of the total number of repondents reported that they had a sibling injured in the fire and 27% had a sibling attend the nightclub on the night of the fire.

2.2 The Questionnaire

2.2.1 Demographic information

Information regarding age, gender, marital and employment status, education, and religious practice were collected.

2.2.2 Effects of Stardust fire on physical health

Several measures of physical wellbeing were used. Respondents' overall evaluation of health pre- and post- the fire disaster were recorded as well as attendance at their general practitioner, and when applicable, admissions to hospital and duration of hospitalisation. Information regarding physical injuries resulting from the Stardust fire which were treated in hospital, were collated from medical notes by the author of the first part of the tripartite study (see Chapter 1). It was hoped to supplement this information by general practitioner contact but this proved impossible due to the large number of general practitioners involved.

2.2.3 Effects of the Stardust fire on mental health

The distribution of psychiatric symptoms in the general population does not correspond to a sharp dichotomy between "cases" and "normals". Psychiatric disturbances are distributed throughout the

population in varying degrees of severity and it can be difficult to ascertain where normality ends and clinically significant disturbance begins. The scores achieved on questionnaires or rating scales give an assessment of an individual's position on an axis from normality to undoubted illness thereby giving a probability estimate of that individual being a psychiatric case. While a dimensional model undoubtedly fits the data better than a binomial ("cases" v "normality) model, surveys starting with a quantitative model frequently choose a threshold point on their continuum that seperates cases from normals and finally adopt a binomial model.

Three specific tests designed to measure conspicuous psychiatric morbidity were administered to interviewees of the current study. Alcohol habits pre- and post- the Stardust fire disaster and a scale indicative of problem drinking in community samples were also documented.

2.2.3.1 The Present State Examination (PSE) is a standardised psychiatric interview which allows the number and severity of psychiatric symptoms to be rated (Wing et al 1974). Although developed originally for use by clinically experienced psychiatrists, it can also be used satisfactorily by trained interviewers who are not psychiatrists to describe the mental state of people in a community setting, most of whom will have only a few symptoms, if any at all (Brown et al 1977). A brief 10-item

screening procedure was subsequently devised that only takes about five minutes or less to complete and has been found to rapidly and efficiently predict negative or very low PSE scores (Cooper & Mackenzie 1981) (Appendix B). This version of the PSE shows a high concordance in delineating "caseness" with the full 140-item PSE and was chosen for the present study. A score of 4+ was used to identify a possible "case". It was complementary to the self-rating procedures allowing independent objective judgement of symptomatology and was scored prior to summating scores on the General Health Questionnaire or the Symptom Check List (see below).

2.2.3.2 The 30-item version of the General Health Questionnaire (GHQ-30) (Goldberg et al 1970)(Appendix C) was carried out. This scale was designed to be a self-administered screening test aimed at detecting psychiatric disorders in community settings and non-psychiatric clinical settings, such as primary care or among general medical out-patients. The questionnaire was designed to be easy to administer, acceptable to respondents, fairly short, and objective in the sense that it did not not require the person administering it to make subjective assessments about respondents (Goldberg & Williams 1988).

There are over 30 published studies using the GHQ-30 and the general view is that scoring yields a division into possible cases (score 5+) and normal respondents (score 0-4).

Random population studies indicate that 35-45% of respondents have a GHQ-30 score of zero, and 25% of interviewees in a consulting

setting score zero (Goldberg & Williams 1988). Although population GHQ-30 scores vary slightly with age and sex, the average scores recorded in a random sample of 6,498 community respondents were 3.61-4.85 (Cox et al 1987).

2.2.3.3 The 90-item self report Symptom Check List (SCL-90) was developed by Derogatis et al (1973), and subsequently modified and validated in the present R(evised) form (Derogatis et al 1976). The SCL-90-R was administered to all respondents. It was designed to primarily reflect the psychological symptom patterns of psychiatric and medical patients. Each item is rated on a 5-point scale of distress. It is scored and interpreted in terms of 9 primary symptom dimensions i.e. somatisation (Som), obsessive-compulsive (O-C), interpersonal sensitivity (I-S), depression (Dep), anxiety (Anx), hostility (Hos), phobic anxiety (Phob), paranoid ideation (Par) and psychoticism (Psy). The usual time reference rated is over the previous seven days. However it was designed with a flexible time-window and here respondents were asked to rate themselves over the previous year. The raw scores for the 9 symptom dimensions are converted into gender-appropriate standard (T) scores which are plotted graphically for comparison with a particular norm (T=50). Normative values have been worked out for various population groups. In the present study interviewees in the aftermath of the Stardust fire were compared to (i) non-patient i.e. "normal" and (ii) psychiatric out-patient norms. The Global Severity Index (GSI) is derived from the SCL-

90-R and represents the best single indicator of disorder and is used where a single summary measure is required. It combines information on numbers of symptoms and the intensity of perceived distress. The GSI values for the different groups being studied are reported in the appropriate sections. The operational rule for caseness states that a respondent must have a GSI score relative to the non-patient norm of greater than or equal to a T-score of 63, or that any two primary dimension T scores are greater than or equal to a T-score of 63.

2.2.3.4 The Michigan Alcoholism Screening Test (MAST) was developed by Selzer (1971) to provide a consistent, quantifiable, structured interview instrument to detect alcohol abuse. It has been validated as a screening scale for alcoholic dependency in hospital and community samples. It comprises 25 questions that can be rapidly administered. These are weighted with various questions having more importance placed upon them than others. The respondent is given a "yes" or "no" choice in answer.
An abbreviated 13-question version of the MAST based on the 25 questions of Seltzer (1971) was used in this study. The cut-off score of 6 or more is found to correctly identify alcoholics. Certain negative responses on the MAST questionnaire (denoted by * in Appendix D) are alcoholic responses.

2.2.4 Ratings of grief

Following a comprehensive review of the literature no single published scale was considered adequate in either coverage of the multifaceted aspects of grief or adequate in quantifying severity. A new visual analogue scale was devised containing 32-items each exploring different dimensions of grief (Appendix E). Each dimension was marked by respondents on a 10 cm line, with absence of the symptom at one end and severe symptomatology at the other. Scores applied to the length in centimetres, from the asymptomatic to the severe, marked by subjects on this line-scale. Absolute numbers on this scale give a crude indication of the severity of the symptom i.e. the higher the number the more severe the symptom. The scale was derived from composite items of the Grief Experience Inventory (Sanders 1978), the Texas Inventory of Grief (Faschinbauerm 1977), the Morbid Grief Scale (Liebermann 1978), the Sydney Grief Scale (Singh & Raphael 1981) and also from the morbid experiences highlighted by Parkes (1971), Maddison & Walker (1967), and Musaph (1973).

The distribution of scores from the bereavement items in each seperate year were normalised, intercorrelated and subject to Principal Component Analysis. The result was a large general factor with over 35% of the variance, the other component's variance was less than 10%. This indicates the centrality of what the different bereavement items have in common as all are loaded heavily on this component. The GHQ-30 by comparison has a general

factor of 34% and is generally considered to measure unidimensionally core psychological distress (Goldberg & Williams 1988). It follows therefore that the items can be aggregated to produce a score for each person reflecting the severity of bereavement. Bereavement scores were computed by adding the bereavement item scores seperately for the first year after the Stardust fire and since the first anniversary of the fire and dividing by the number of items (Appendix F).

The non-bereaved respondents were asked about the fate of friends and acquaintances in the fire as this would have implications for their subsequent course.

2.2.5 Legal and compensation issues

Open ended questions relating to participation on committees set up in the aftermath of the Stardust fire, financial aid received from the Disaster Fund, perceptions of the response of civil authorities and intent to seek financial recompense were asked.

2.2.6 Other

Employment status of those affected by the fire and changes in same since the disaster were noted as were number of days on sick leave and coping ability at work was noted. Changes in leisure-time activities since the fire and also in the number of friends and quality of friendships was collated.

Information on the type of social supports i.e. family, neighbours, clergy and other professional agencies was collected and the extent to which these supports were perceived as being of help. They were rated as being very helpful, helpful or of no help.

2.3 Interviewers

Six female interviewers were recruited to conduct the fieldwork along with a research assistant. Five were from the Economic & Social Research Institute's panel of interviewers and one was a university social science graduate. All had extensive interviewing experience. Each person attended training sessions at which all aspects of the work was explained in detail. These included familiarisation with the questionnaire and standardisation of the method of interview particularly with reference to administering the various scales. Each interviewer was provided with a letter of identification and with any background information which was available about the respondents.

2.4 The pilot study

As the nature of the enquiry was potentially painful it was decided to carry out a pilot study to ascertain how people would respond to the questions, and the interview duration. Certain questions which respondents had difficulty in understanding were consequently rephrased. The bereaved Stardust fire families were not approached

for pilot study interviews.

The questionnaire (2.2) had been designed for collecting data from different samples i.e. bereaved and non-bereaved. The questions relating to bereavement were tested on people bereaved in the first quarter of 1981 contacted through the Bereaved Parents Association or obtained from a national daily newspaper obituary column. This sample consisted of five bereaved parents and two widows who experienced a sudden and unexpected loss. People bereaved during the same period as the Stardust fire were selected thus enabling the two time frames i.e. "during the first year" and "since the first anniversity" used in the bereavement scale to be tested , and the adequacy of recall by respondents.

Ten people (five injured, five uninjured) were randomly selected from the lists of Stardust survivors and interviewed. These interviews were retained for inclusion in the main study. Screening tests were separated on the questionnaire to avoid contamination. Psychiatric instruments were tested on a sample of patients attending a psychiatric day hospital in Dublin.

2.5 Fieldwork

The fieldwork took place between October 1982 and May 1983. Almost all interviews were conducted in the respondents own homes, many at night or weekends, as these proved the most convenient times for those involved. The duration of the interview ranged from 25 - 150 minutes. Sixty three percent of interviews took place between the

interviewer and the respondent alone while 37% were in the presence of others.

Interviewers rated the reception they had from the respondent. Fifty five percent were rated excellent, 26% as very good, 13% as good, 3% as fair and 2% as fair, improving later. Two of the respondents were classified as hostile. Despite a tendency to under-report some hostility, interviewers were well received by the respondents.

2.6 Coding & processing of data

Many of the questions were pre-coded. A code-book was designed for those which were open ended and the data computer stored. Statistical analysis was performed using SPSS-9 and SPSSX at the Computer Centre, University College, Dublin.

3. The Stardust Fire Disaster - Results.

The results of interviewing four discrete groups of people associated with the Stardust fire: bereaved relatives (n=147), the hospitalised injured (n=98), the casualty department-treated injured (n=101) and a random sample of 50 people who attended the Stardust on the night of the fire but who escaped without injury ("the attenders"), are presented in this section. While all 396 respondents answered the questionnaire, some did not respond to certain questions.

3.1 Bereaved relatives (n=147)

3.1.1 Demography:

One hundred and forty seven people who had a first degree relative i.e. spouse (n=1), offspring (n=55) or sibling (n=91), perish in the Stardust fire were interviewed between October 18th, 1982 and May 24th, 1983 (20-27 months after the fire).

For descriptive and analytical purposes bereaved parents and siblings are reported seperately. As this study relates to adults, siblings under the age of 16 years are the subject of a separate study on the effect of the Stardust fire on children.

(i) Bereaved Parents - These comprised 37% (21/56) male and 63%

(35/56) female. The average age of the sample was 50 (±7)*, range 38-62 years.

The ages at which they finished formal schooling indicated that 67% had left school by the age of 14 years (Table 3).

Table 3: School leaving age of the bereaved parents.

Age (years) on completion of formal schooling.		Number of subjects	
	12	1	(2%)
	13	4	(7%)
	14	32	(58%)
	15	9	(16%)
	16	4	(7%)
	17	3	(5%)
	18	2	(4%)
Mean age	15 (±1)	Total	55 (99%)
		(no information on one respondent)	

The educational level of those interviewed was as follows: 71% (40/56) had attended primary school only; 25% (14/56) had attended secondary school up to Intermediate Certificate or Group Certificate standard; 4% (2/56) had remained in school up to Leaving Certificate standard.

Footnote* **standard deviation** is denoted by **(±)** throughout the text.

Thirty six percent (20/56) of the bereaved parents were involved in full- or part- time work. There was an unemployment rate of 23% (6/26), of whom 66% (4/6) were unemployed for more than 1 year. The remaining 30 interviewees were either housewives (n=28), or retired (n=2).

(ii) Bereaved siblings - These comprised 58% (53/91) male and 42% (38/91) female. The average age of the interviewees was 22 (±6), range 16-36 years.

Ninety five percent (86/91) of the sample had left school. Sixty two percent (53/86) had left by the age of 15 years. The average age at which they left school was 15 (±1), range 12-18 years. The school leaving ages of bereaved siblings is shown in Table 4. The level of education of the interviewees was 24% (21/87) attended school to primary level only; 67% (58/87) attended to Intermediate Certificate or Group Certificate standard and 9% (8/87) attended to Leaving Certificate standard. Five percent of the total number of bereaved siblings were still attending school.

Table 4: School leaving age of bereaved siblings

Age (years) on completion of formal schooling	Number of respondents (%)
12	2 (2%)
13	3 (3%)
14	22(26%)
15	26(31%)
16	22(26%)
17	9(10%)
18	2 (2%)
Mean age 15 (±1)	Total 86
	(No information on 5 respondents)

Fifty eight percent (52/89) of the bereaved siblings were involved in full- or part- time work, and 15% (13/89) were unemployed, of whom 23% (3/13) were out of work for more than 12 months. The unemployment rate was 20% (13/65). Of the remaining respondents 18% (16/89) were housewives and 9% (8/89) were students/apprentices.

3.1.2 General Health

(i) Parents - Sixty two percent (33/53) of bereaved parents felt that their health had disimproved since the Stardust fire, 36%

(19/53) felt that their general health was unchanged and only 2% (1/53) felt that their health was better than it had been before the fire. Formal contact with general practitioners in the 24 months before the fire was compared to general practitioner contact in the 20-27 months since. Before the fire bereaved parents had an average of 8 (±10), range 0-48 visits, with 38% (21/54) not having any occasion to visit their doctor. Since the fire, parents had an average of 16 (±20), range 0-84 visits, with the number not having any contact with their general practitioner now falling to 16% (9/55). When the rate of contact with family doctors are compared before and since the Stardust fire a statistically significant difference between the two rates is found ($t=2.3$, $df=77$, $p<0.02$).

Admissions to hospital in the 24 months before the fire were compared to hospitalisations in the 20-27 months since. Before the fire 82% (46/56) of parents had not needed hospital admission and the duration of hospital stay among those who were admitted averaged 42 (±47), range 1-124 days. Since the fire 88% (49/56) had not needed admission and the average stay among those who needed to be hospitalised was 18 (±17), range 1-42 days. There is no statistical difference between these two rates ($t=1.5$, $df=15$, NS).

(ii) Siblings - Sixty four percent (58/90) of bereaved siblings felt that their general health was unchanged since the Stardust fire, 30% (27/90) assessed their health to be worse and 6% (5/90)

thought that their health had improved since the fire. The formal contact interviewees had with their general practitioners was examined both in the 24 months before the fire and the 20-27 months after it, giving a nonspecific indication of their health and well being. In the two years before the fire 65% (59/91) of the bereaved siblings had not had occasion to consult with their family doctor. Of the remaining 35% (32/91) the average number of visits to their general practitioner was 4 ($\pm$4), range 1-20 visits. In the 20-27 months after the fire the percentage of respondents visiting their family doctors had risen sharply to 66% (58/88) with only 34% (30/88) not needing a medical consultation. The average number of general practitioner consultations was 7 ($\pm$9), range 1-40. When the number of visits pre- and post- the Stardust fire are compared a statistically significant difference is found ($t=2.1$, $df=88$, $p<0.05$).

Admissions to hospital among bereaved siblings was enquired about in the 24 months before the fire and subsequent to this to the time of interview. Eighty two percent of the interviewees (75/91) had not needed hospital admission and 18% (16/91) spent an average of 10 ($\pm$9), range 1-28, days in hospital. After the fire 85% (77/91) of the siblings did not have an admission to hospital while hospitalisations for the remaining 15% (14/91) were on average 9 ($\pm$9), range 1-29, days. When the hospital admissions were compared pre- and post- the Stardust fire no statistical difference is found between the two time periods ($t=0.3$, $df=28$, NS).

3.1.3 Psychopathology

(i) Parents - Respondents were asked about their need to be referred to a psychiatrist for outpatient consultation in the 24 months before the Stardust fire and this was compared to consultation rates in the 20-27 months since the fire. Note was also taken of any history of nervous illness in the respondent's past life. Four percent of parents (2/56) had seen a psychiatrist on two and six occasions respectively in the 24 months before the occurrence of the fire. Since the fire 21% (12/56) of had been seen by a psychiatrist in an outpatient setting, with an average of 7 (±8), range 1-24 consultations. Only 5% (3/56) had ever had a consultation with a psychiatrist prior to the study period.
None of those interviewed had treatment in a psychiatric hospital prior to the Stardust fire. Subsequent to the fire 5% (3/55) of bereaved parents spent 7, 42 and 150 days in a psychiatric hospital because of nervous complaints.

(ii) Siblings - None of the bereaved siblings had sought an outpatient consult with a psychiatrist nor had they been admitted to a psychiatric hospital in the 24 months before the Stardust fire. Since the fire 11% (10/89) had seen a psychiatrist on an average of 2 (±2), range 1-7 occasions. Prior to the study period 6% (6/91) of siblings had sought a psychiatric consult.
Seven percent (6/91) had spent an average of 15 (±9), range 1-28 days in a psychiatric hospital since the fire.

(ii) Present State Examination (PSE):

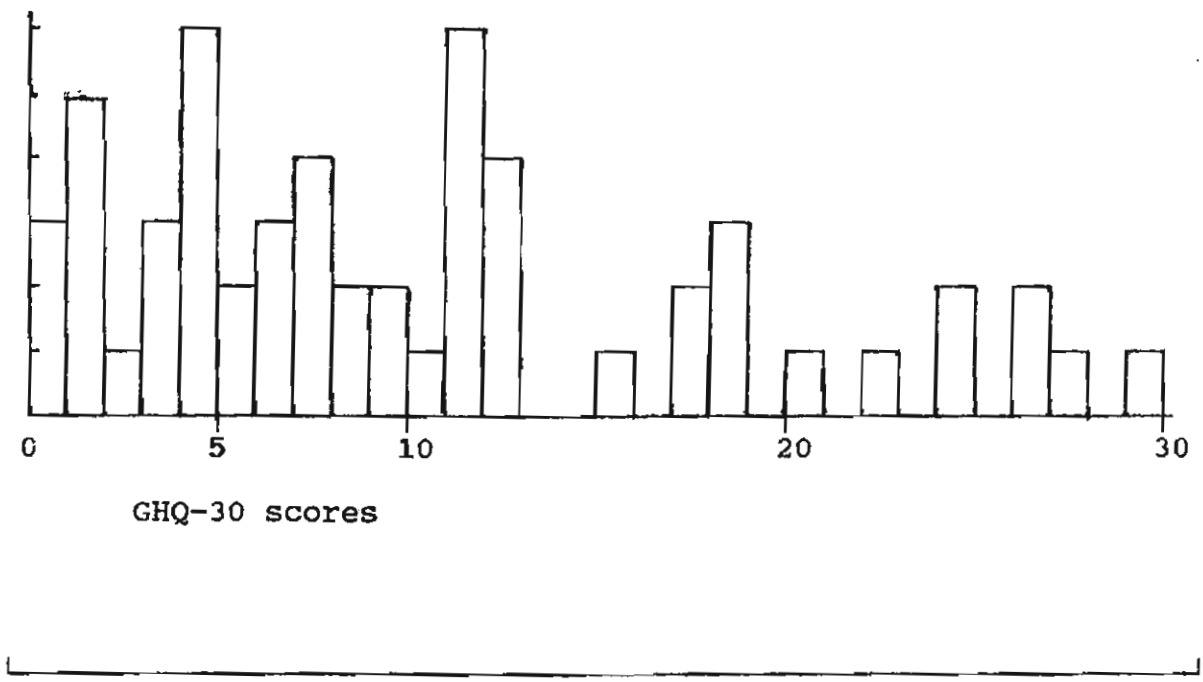
(a) Parents - Thirty four percent (19/56) of respondents scored less than 4 on this questionnaire, the cut-off point delineating "caseness", and of these 13% (7/56) scored zero indicating an absence of psychopathology. Sixty three percent of mothers and 53% of fathers scored 4 or over on this screening test indicative of formal psychopathology. The overall average score was 6 (±4), range 0-14.

(b) Siblings - Sixty four percent (58/91) of bereaved siblings scored less than 4 on the PSE and 32% (29/91) had a zero score. Fifty six percent of sisters and 20% brothers scored 4 or more. The overall average score was 4 (±5), range 0-18.

(iii) General Health Questionnaire (GHQ-30):

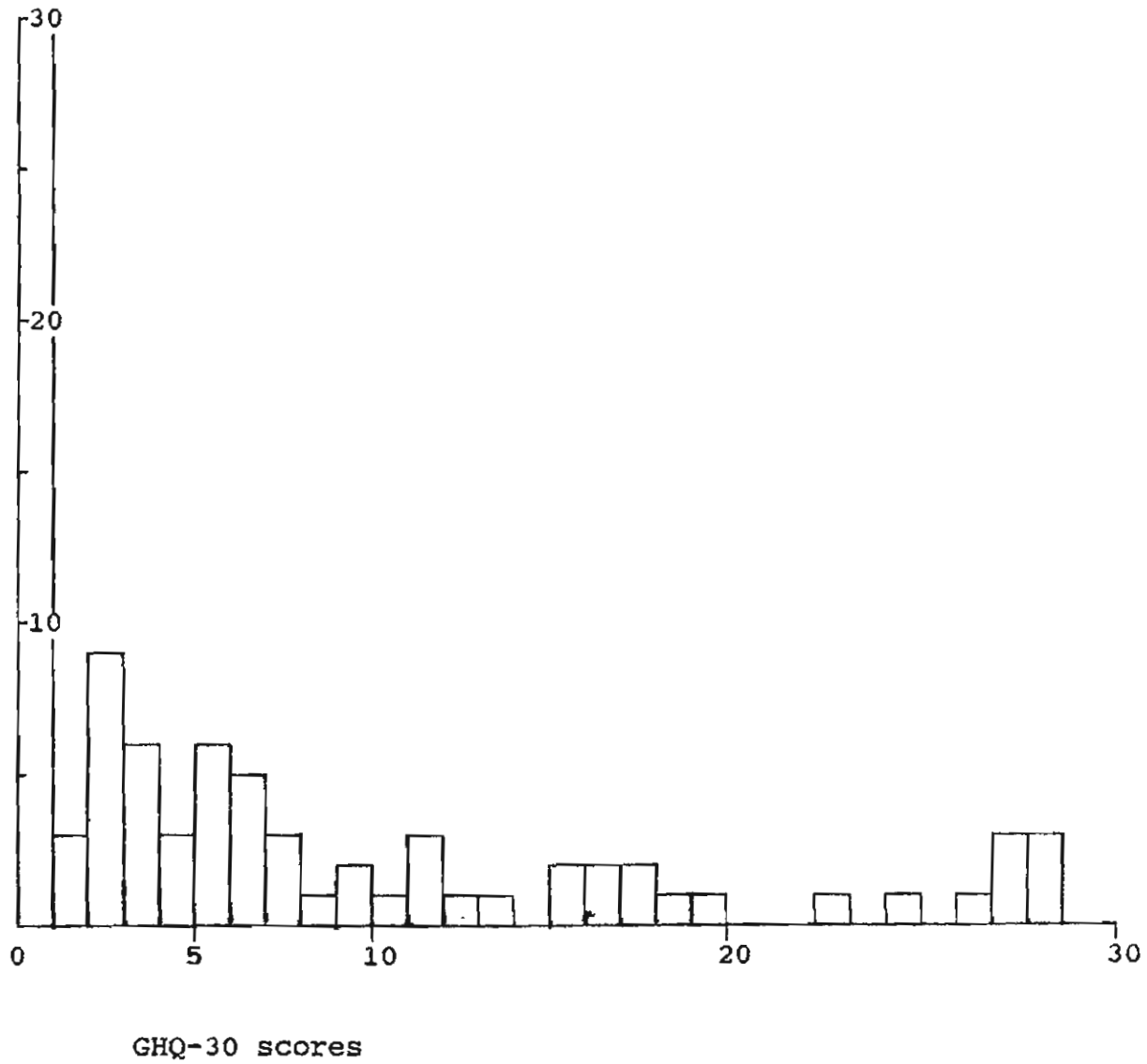
(a) Parents - Administration of this self-rating questionnaire to the 56 bereaved parents demonstrated that 5% (3/56) scored zero and 32% (18/56) had a score of 4 or less, which is within the normal range (Figure 1). When GHQ-30 scores are examined by sex of respondents 52% of fathers and 77% of mothers scored more than 5. The overall mean GHQ-30 score was 10 (±20), range 0-29.

Figure 1: General Health Questionnaire (GHQ-30) of Bereaved Parents (n=56)



(b) Siblings - Thirty three percent (30/91) of the bereaved siblings scored zero on the GHQ-30 and 56% scored less than 5 (Figure 2). The percentage of bereaved brothers who scored more than 5 on the GHQ-30 was 28% and of sisters was 66%. The mean overall GHQ-30 score was 7 (±8), range 0-28.

Figure 2: General Health Questionnaire (GHQ-30) of Bereaved Siblings (n=91)



(iv) Symptom Check List (SCL-90-R)

Scores on the nine items on the SCL-90-R comparing bereaved parents with non-patient norms [Table 5 (i)] shows similarity of profiles between bereaved fathers and mothers [Figure 3 (i)], which are markedly abnormal. Measures of the depression (Dep) and obsessive-compulsive (O-C) dimensions were high for both sexes and measures of somatisation (Som) were relatively high for fathers but low for mothers. Mothers achieved high scores for anxiety (Anx) and phobic anxiety (Phob).

The symptoms of the depression dimension reflect a broad range of the manifestations of clinical depression: withdrawal of life interest, lack of motivation and loss of vital energy. Feelings of hopelessness and thoughts of suicide are also included. The obsessive-compulsive dimension focuses on thoughts, impulses, and actions that are experienced as unremitting and irresistible by the individual but are of an unwanted nature. The anxiety dimension is composed of symptoms of nervousness, tension and trembling and cognitive compoments involving feelings of apprehension and dread. Phobic anxiety as suffered by many of the bereaved mothers is defined as a persistent fear response to a specific person, place, object, or situation which is characterised as being irrational and disproportionate to the stimulus and which leads to avoidance or escape behaviour. Bereaved fathers tended to have relatively high levels of somatisation, reflecting distress arising from perceptions of bodily dysfunction. Complaints focused on

cardiovascular, gastrointestinal, respiratory and other systems tend to be present and headaches, pain and discomfort of the gross musculature also predominate in those who score highly on this item. Sixty nine percent of mothers and 62% of fathers qualify as SCL-90-R cases.

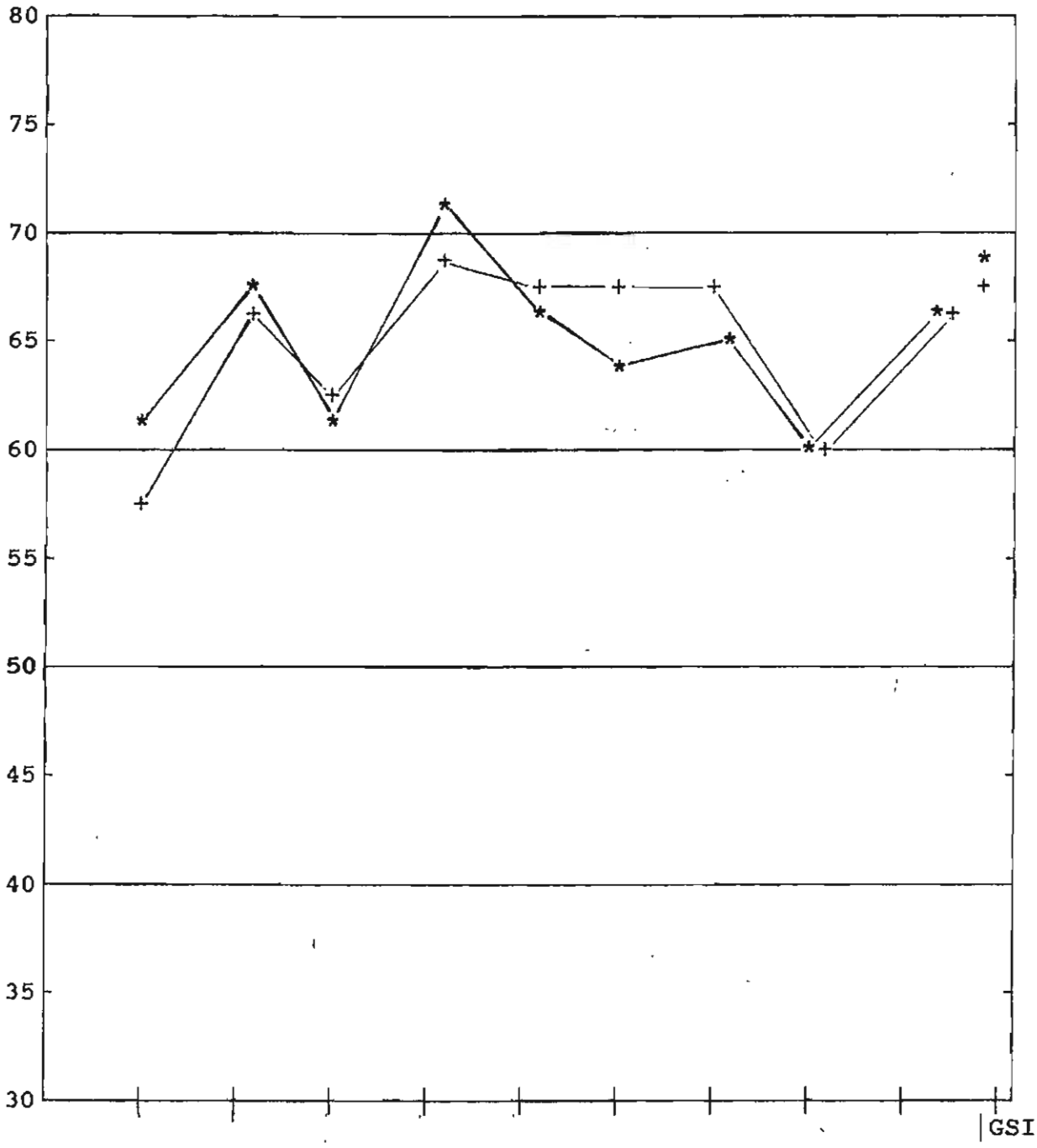
Table 5 (i): Mean SCL-90-R scores (a) bereaved fathers compared to male non-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	61	67	61	71	66	63	65	60	66	68
Raw	.64	1.18	.57	1.30	.81	.84	.37	.71	.57	.81

(b) bereaved mothers compared to female non-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	57	66	62	69	69	67	68	60	66	69
Raw	.58	1.57	.90	1.93	1.53	1.10	1.09	.72	.72	1.26

Figure 3 (i): SCL-90-R Symptom Profile (Bereaved Parents) compared to non-patient norms



(iv) Symptom Check List (SCL-90-R)(continued)

Comparison of bereaved parents SCL-90-R scores to psychiatric out-patient norms [Table 5 (ii)] gives a profile which does not show marked deviation from this norm [Figure 3 (ii)]. There was slight evidence of gender-related differences with somatisation showing most prominence in the fathers and phobic anxiety features predominating in mothers.

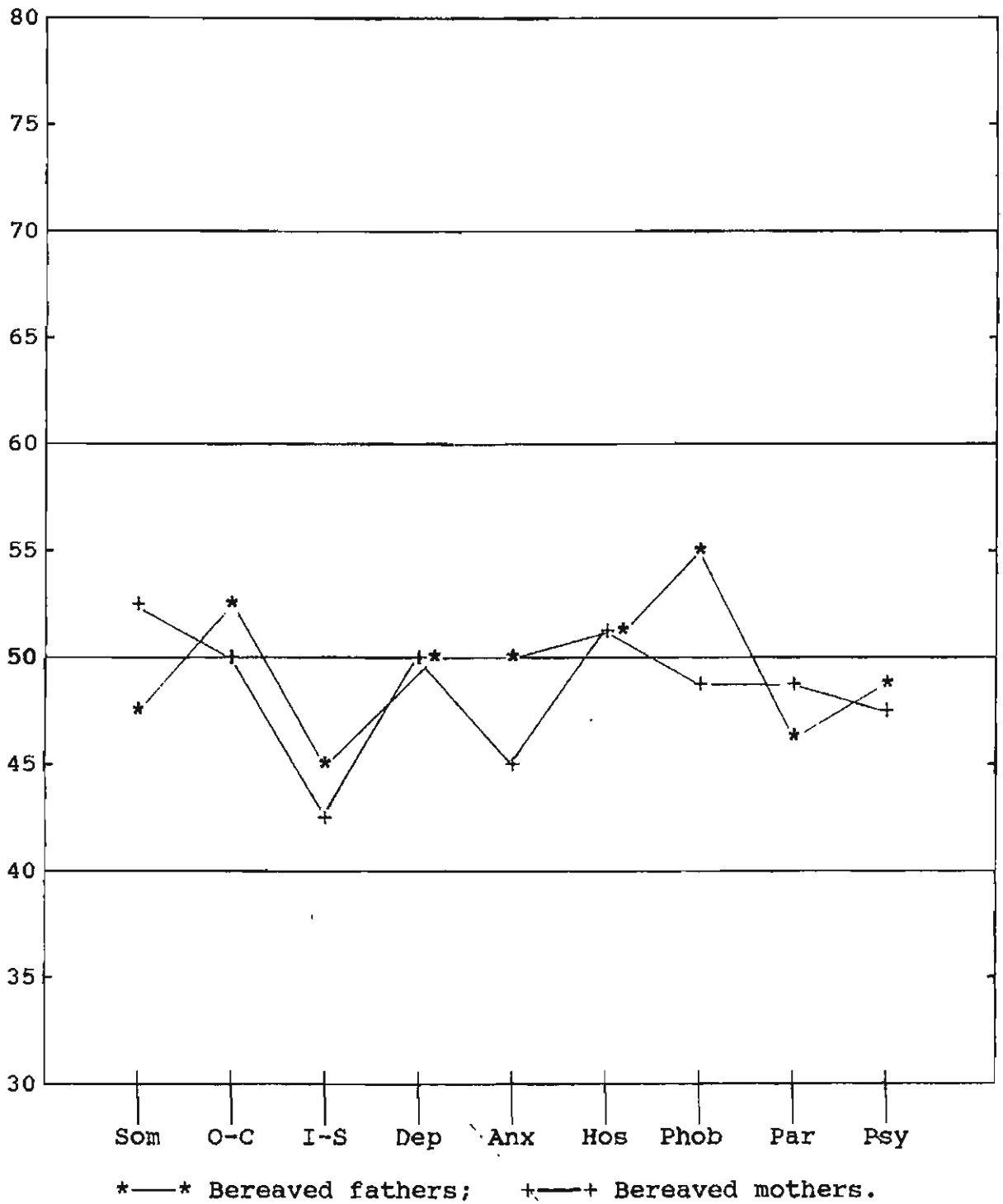
Table 5 (ii): Mean SCL-90-R scores (a) bereaved fathers compared to male psychiatric out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	52	50	42	50	46	51	49	49	47
Raw	.64	1.18	.57	1.30	.81	.84	.37	.71	.57

(b) bereaved mothers compared to female psychiatric out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	47	52	45	50	50	51	55	47	50
Raw	.58	1.57	.90	1.93	1.53	1.10	1.09	.72	.72

Figure 3 (ii): SCL-90-R Symptom Profile (Bereaved Parents) compared to psychiatric out-patient norms



(iv) Symptom Check List (SCL-90-R)(continued)

The SCL-90-R scores of bereaved siblings [Table 6 (i)] compared to non-patient norms indicated bereaved sisters were found to have more global evidence of distress than bereaved brothers [Figure 4 (i)]. This was especially marked for measures of depression, interpersonal sensitivity (I-S), hostility (Hos) and phobic anxiety. Brothers had a relatively deviant measure on symptoms of phobic anxiety. Overall, the bereaved sisters had a more abnormal profile than bereaved mothers [Figure 3(i)].

The interpersonal sensitivity dimension focuses on feelings of personal inadequacy and inferiority, particularly in comparisons with others. Self-depreciation, feelings of uneasiness, and marked discomfort during interpersonal interactions are characteristic manifestations of this syndrome. Individuals with high I-S scores report acute self-consciousness and negative expectancies concerning the communications and interpersonal behaviours with others. The hostility dimension reflects thoughts, feelings or actions that are characteristics of the negative affect state of anger which reflects qualities such as aggression, irritability, rage and resentment.

Sixty one percent of sisters and 34% of brothers qualify as cases using the SCL-90-R.

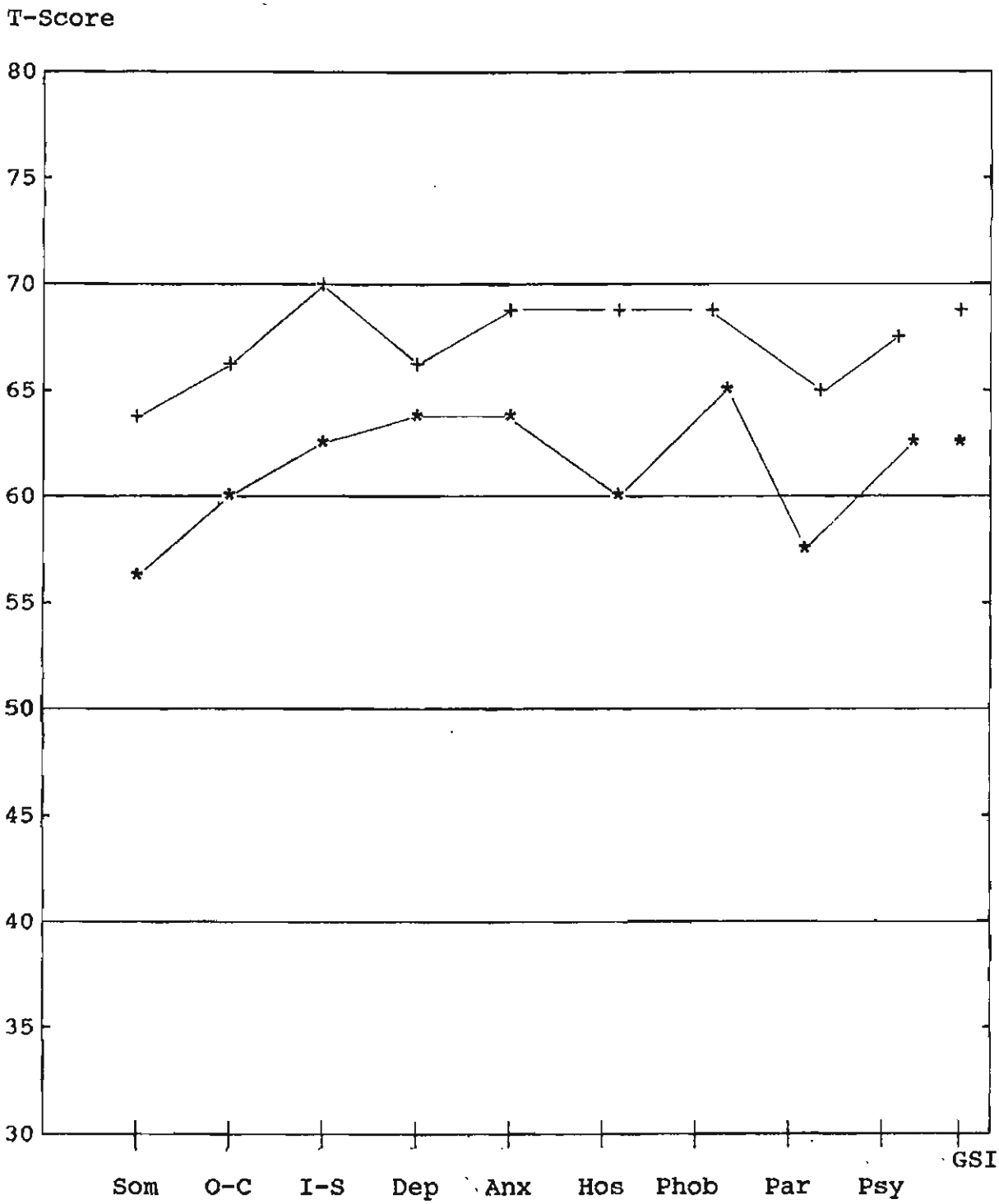
Table 6 (i): Mean SCL-90-R scores (a) bereaved brothers compared to male non-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	56	60	62	63	64	60	65	57	62	62
Raw	.40	.71	.66	.76	.58	.63	.38	.58	.39	.57

(b) bereaved sisters compared to female non-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	63	66	69	66	68	69	69	65	67	69
Raw	1.03	1.47	1.45	1.54	1.41	1.35	1.23	1.17	.82	1.28

Figure 4 (i): SCL-90-R Symptom Profile (Bereaved Siblings) compared to non-patient norms



(iv) Symptom Check List (SCL-90-R)(continued)

When SCL-90-R scores of bereaved siblings are compared to psychiatric out-patients [Table 6(ii)] bereaved brothers score less than the norm on all measures whereas sisters continue to show scores which are at or above the norm [Figure 4(ii)], especially for items related to hostility and phobic anxiety.

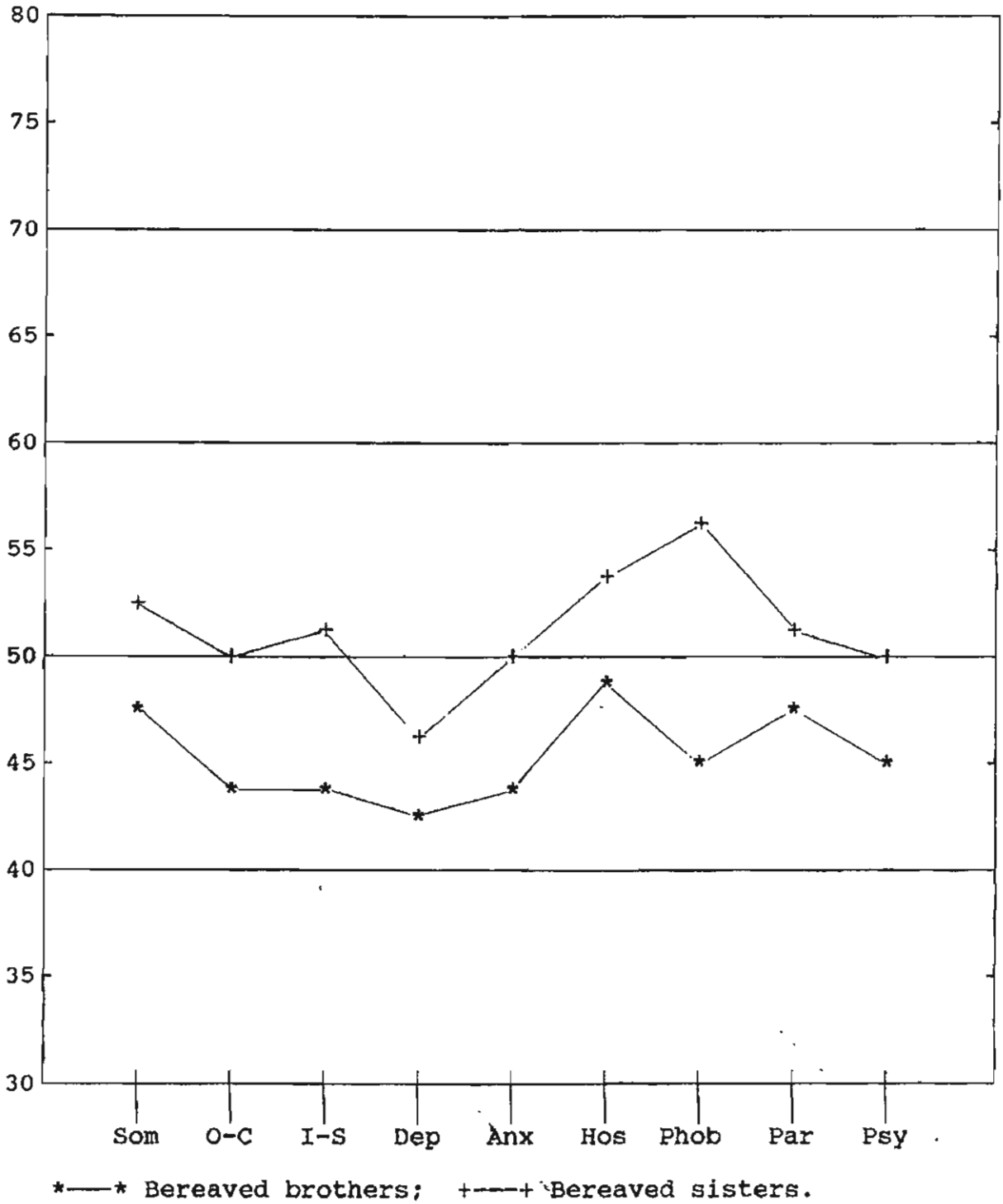
Table 6 (ii): Mean SCL-90-R scores (a) bereaved brothers compared to male psychiatric out-patients norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	47	43	43	41	43	49	45	47	45
Raw	.40	.71	.66	.76	.58	.63	.38	.58	.39

(b) bereaved sisters compared to female psychiatric out-patients norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	52	50	51	46	50	53	56	51	50
Raw	1.03	1.47	1.45	1.54	1.41	1.35	1.23	1.17	.82

Figure 4 (ii): SCL-90-R Symptom Profile (Bereaved Siblings) compared to psychiatric out-patients



(v) Bereavement Experience:

(a) Parents - Respondents were asked about their lifetime experience of bereavement prior to the Stardust fire. Ninety three percent (52/56) suffered at least one previous bereavement. Of these, 68% (38/56) bereavements had related to the loss of a parent, 9% (5/56) had been the loss of a sibling, 7% (4/56) had lost offspring and 9% (5/56) had lost other relatives. These index bereavements had occurred on average 17 (±12) years previously, and respondents had taken an average of 13 (±28) months to "get over" the loss.

In relation to their Stardust fire bereavement parents were asked to fill out a self-rating visual analogue bereavement scale [Appendix E (i)] for the first year after the fire and since the first anniversary [Table 7 (i)].

A highly significant amelioration of many of the symptoms of bereavement was experienced (designated by *** on Table 7) after the first anniversary of the fire. There was not any change in the subjective experiences of difficulty in accepting the death, restlessness, sense of the deceased presence, the death seeming unreal, idealisation of the deceased. Anger and resentment about the fire, which was directed against specific individuals was also still very apparent and unchanged in any significant way. Items such as guilt, self-blame, recurrent nighmares, adaptation of the deceased characteristics and loss of contact with friends and neighbours were found to be unchanged, but not of great magnitude,

over the two index time periods.

Bereavement items were computed by adding the bereavement items seperately for the first year after the fire and the second year and dividing by the number of items. For bereaved parents the scores were 6.4 (±1.6) for the first year and 4.4 (±1.8) for the second year i.e. since the first anniversary. These figures were also computed seperately for fathers: 5.2 (±1.6) for the first year, 4.0 (±1.8) for the second year; and mothers 7.0 (±1.3) for the first year, 5.4 (±2.0) for the second year.

Table 7 (i): Bereavement Items - parents responses.

[(1)= in first year after the fire;
(2)= since the first anniversary)].

Question	(1)	(2)
Preoccupation with painful thoughts of deceased?	9.3	8.4 **
Fits of crying?	7.8	6.2 *
Hard to accept the death?	9.3	8.5 NS
Loss of appetite?	6.6	3.5***
Loss of weight?	6.1	2.8***
Conscious of deceased presence in familiar places?	8.6	7.7 NS
Death seemed unreal?	9.1	8.3 NS
Difficulty in sleeping?	7.9	5.8***
Dreams in which deceased seemed alive and real?	6.3	4.8 *
Difficulty in concentrating?	7.8	5.2***
Cross and irritable?	6.3	4.0 **
Avoidance of places which trigger memories?	7.3	5.7***

Bereavement Scale (continued)	(1)	(2)
Unable to cope?	6.6	4.2***
Upset when thinking about deceased?	9.2	7.9 **
Life meaningless?	7.4	5.2 **
Self blame?	1.3	0.8 NS
Imagining deceased's suffering?	3.9	2.6 *
Upset at anniversaries/birthdays?	9.1	8.2 *
Recurrent nightmares?	2.3	1.6 NS
Idealisation of deceased?	8.5	8.3 NS
Adaptation of deceased's characteristics?	1.3	0.8 NS
Relationships with others under strain?	5.1	3.7 **
Difficulty in remembering things?	6.7	5.0 *
Restlessness?	7.4	6.0 NS
Panic attacks?	6.0	4.3 *
Loss of contact with relations & friends?	3.3	3.0 NS
Physical attacks?	6.6	4.3 **
Guilt?	1.3	0.7 NS
Anger & resentment over death?	8.8	8.2 NS
Anger & resentment directed at specific people?	5.5	4.8 NS
Painful visiting burial place?	6.5	4.3***
Painful sorting through deceased's belongings?	7.6	5.5***

NS = not statistically significant;

* = $p<0.05$; statistically significant;

** = $p<0.01$;

*** = $p<0.001$; highly statistically significant.

(b) Siblings - Of the siblings 81% (74/91) had previously experienced a bereavement. Sixteen percent (12/74) had lost a parent, 7% (5/74) a sibling, 3% (2/74) a child, 62% (46/74) another relative and 12% (9/74) had lost a friend. These deaths had taken place an average of 5 (±4) years previously and it had taken an estimated 7 (±13) months to "get over" the loss.

On filling out the self-rating visual analogue bereavement scale [Appendix E(ii)] many symptoms had abated although a number of distressing factors which had not altered were found to be common to both bereaved siblings and bereaved parents [Table 7(ii)]. These factors were the death seeming to be unreal, idealisation of the deceased, anger and resentment both generalised and directed against particular people. Siblings also reported that a number of factors had not changed over the time periods under study such as guilt, self blame, adaptation of the deceased characteristics, imagining the deceased' suffering and relationships under strain but that these were not very marked.

Bereavement scores for the siblings were given as 5.6 (±2.2) for the first year and 4.0 (±2.4) for the second year. When bereavement scores were computed seperately: males scored 4.6 (±2.2) in the first year, 3.1 (±2.2) in the second year; females scored 6.9 (±1.4) in the first year, 5.2 (±2.2) in the second year. Bereavement Items for parents and siblings are depicted graphically in Appendix F.

Table 7 (ii): Bereavement Items - siblings response.

[(1)= in first year after the fire;
(2)= since the first anniversary)].

Question	(1)	(2)
Preoccupation with painful thoughts of deceased?	8.1	6.2***
Fits of crying?	6.9	3.8***
Hard to accept the death?	8.3	6.7 **
Loss of appetite?	4.8	2.1***
Loss of weight?	4.2	2.1***
Conscious of deceased presence in familiar places?	7.5	5.2 **
Death seemed unreal?	7.9	7.0 NS
Difficulty in sleeping?	5.9	3.2***
Dreams in which deceased seemed alive and real?	6.7	4.0***
Difficulty in concentrating?	5.7	3.0***
Cross and irritable?	5.1	3.0***
Avoidance of places which trigger memories?	5.1	3.7 *
Unable to cope?	4.7	2.6***
Upset when thinking about deceased?	8.2	6.5***
Life meaningless?	5.2	2.8***
Self blame?	1.6	1.2 NS
Imagining deceased's suffering?	3.3	2.5 NS
Upset at anniversaries/birthdays?	7.9	6.7 *
Recurrent nightmares?	3.4	1.9 **
Idealisation of deceased?	8.0	7.8 NS
Adaptation of deceased's characteristics?	3.6	2.9 NS

Bereavement Scale (continued)	(1)	(2)
Relationships with others under strain?	3.2	2.3 NS
Difficulty in remembering things?	3.1	2.0 *
Restlessness?	5.6	3.9 *
Panic attacks?	3.2	2.1 *
Loss of contact with relations & friends?	2.5	2.1 NS
Physical attacks?	3.5	2.2 **
Guilt?	2.2	1.8 NS
Anger & resentment over death?	8.5	7.6 NS
Anger & resentment directed at specific people?	6.2	5.0 NS
Painful visiting burial place?	6.2	4.4 **
Painful sorting through deceased's belongings?	6.0	4.2 *

NS = not statistically significant;

* = $p<0.05$; statistically significant;

** = $p<0.01$;

*** = $p<0.001$; highly statistically significant.

(v) Alcohol-related habits :

The current drinking habits of the bereaved relatives were enquired into and a MAST score calculated.

(a) Parents - Of the 56 parents, 89% (48/54) scored zero on this scale and the remaining 11% (6/54) scored less than 6. None of the bereaved parents had a score of 6 or greater, indicative of problem

drinking.

Changes in alcohol useage since the fire were also examined and the majority of respondents had not altered their alcohol consumption since the Stardust fire [Table 8(i)].

(b) Siblings - The alcohol consumption habits of the bereaved siblings indicated that 87% (73/84) scored zero on the MAST scale and a total of 98% (82/84) scored less than 6, leaving 2% (2/84) in the pathological drinking category.

Thirty five percent (32/91) of the respondents were non-drinkers and 34% (31/91) were unchanged in their alcohol intake from before the Stardust fire. Nineteen percent (17/91) estimated that they were drinking more than before the fire and 12% (11/91) felt that they were taking less alcohol [Table 8 (ii)].

Table 8 (i): Drinking habits of bereaved parents.

Drinking category	Number (%)
Non drinker	12 (21%)
More than before the fire	8 (14%)
The same as before the fire	31 (55%)
Less than before the fire	5 (9%)

Table 8 (ii): Drinking habits of bereaved siblings.

Drinking category	Number (%)
Non drinker	32 (35%)
More than before the fire	17 (19%)
The same as before the fire	31 (34%)
Less than before the fire	11 (12%)

3.1.4 Quality of life of bereaved relatives:

(i) Employment

(a) Parents - The effect of the Stardust fire on bereaved parents work record and career was explored. At the time of the fire 54% (30/56) were housewives, 39% (22/56) were in either full- or part-time employment, 5% (3/56) were unemployed and 1% (1/56) were retired. The unemployment rate was 12% (3/25).

After the fire employed parents took an average of 34 (±53), range 3-240, days before resuming work [Table 9(i)].

Forty nine percent of respondents were coping with their job as they had before the Stardust fire and 51% felt that they were working less well than previously.

When asked about the effect of the Stardust fire on respondents work and career 47% (15/32) felt that it had a positive effect, 19%

(6/32) felt that the effect was negative and 25% (8/32) did not feel that their work prospects were affected at all [Table 10(i)].

(b) Siblings - At the time of the Stardust fire 54% (49/91) of the bereaved siblings were in full- or part- time employment, 23% (21/91) were students/apprentices, 15% (14/91) were housewives and 8% (7/91) were unemployed. The unemployment rate was 13% (7/56). It took an average of 25 (±32), range 3-182 days before bereaved siblings returned to work after the Stardust fire [Table 9(ii)]. When bereaved parents and siblings are compared in terms of the number of days before returning to work there is no statistical difference between the two groups (t=0.71, df=77, NS).

Seventy seven percent (63/82) were coping as well with their work as they had before the fire, 18% (15/82) were coping worse and 5% (4/82) coping better than previously.

Forty one percent (31/91) of bereaved siblings felt that the Stardust fire had no effect on their career, 33% (25/91) felt the effect was positive, 14% (11/91) a negative effect and 12% were uncertain [Table 10(ii)].

Table 9(i): Number of days taken by bereaved parents before returning to work after the Stardust fire.

Time duration	Number (%)
7 days or less	6 (30%)
8-14 days	5 (25%)
15-21 days	1 (5%)
22-28 days	-
29-168 days	7 (35%)
169-240 days	1 (5%)
Average 34(±53) days	Total 20 (no data on 36 interviewees).

Table 9(ii): Number of days taken by bereaved siblings before returning to work after the Stardust fire.

Time duration	Number (%)
7 days or less	14 (25%)
8-14 days	23 (40%)
15-21 days	5 (9%)
22-28 days	4 (7%)
29-168 days	10 (18%)
169-240 days	1 (1%)
Average 25 (±32) days	Total 57 (no data on 34 respondents)

Table 10(i): Effect of the Stardust fire disaster on work and career of bereaved parents

Effect	Number of respondents (%)
Positive (beneficial)	15 (47%)
Negative (bad)	19 (6%)
None (no change)	8 (25%)
Uncertain	3 (9%)

Total 32 (no data on 24 respondents.

Table 10(ii): Effect of the Stardust fire disaster on work and career of bereaved siblings

Effect	Number of respondents (%)
Positive (beneficial)	25 (33%)
Negative (bad)	12 (14%)
None (no change)	31 (41%)
Uncertain	9 (12%)

Total 77 (no data on 14 respondents).

(ii) Sick leave

(a) Parents - The number of days of sick leave over the previous year was enquired into and this was compared with the respondent's recollection of their previous sick leave record. Twenty four

percent (4/17) of the bereaved parents had no sick leave in the 12 months before interview and the remainder had an average of 18 (±10), range 2-35 days off work because of illness. Sixty percent (9/15) of respondents estimated this to be more than their previous amount of sick leave, 27% (4/15) thought that it was no different to usual and only 13% (2/15) felt that this was less.

(b) Siblings - An average of 19 (±33), range 1-180 working days were lost because of illness during the year prior to interview by bereaved siblings, while 29% (13/45) did not need to take sick leave. Forty percent (16/40) estimated this to be more than their former sick leave, 45% (18/40) felt that this was not different from other years and 15% (6/40) felt that their amount of recent sick leave was less than usual.

(iii) Sociability & leisure-time activities

(a) Parents - Sixty nine percent of bereaved parents had resumed a normal routine when they were interviewed 20-27 months after the Stardust fire, while the remaining 31% had not yet established such a pattern. It took an average of 16 (±17), weeks for these respondents to readjust.

An indication of how the 56 bereaved parents were now living their lives, showing the perceived differences in coping with everyday events, since the Stardust fire is given in Table 11(i). Parents were in general going out socially less frequently than before and

were lacking in confidence compared to before the fire.

(b) Siblings - Eighty seven percent (79/91) of respondents took an average of 12 (±14) weeks to resume what they considered to be a normal routine. Various aspects of daily living, and changes in same since the fire are outlined in Table 11(ii). Bereaved siblings social activities were curtailed and their confidence was felt to be much less than before the fire.

Table 11(i): Aspects of normal day-to-day life of the bereaved parents since the Stardust fire.

Factor	Better (More)	Same	Worse (Less)	Unknown
Ability to cope with tasks?	-	27(48%)	28(50%)	1 (2%)
Get on well with family?	14(26%)	34(61%)	7(13%)	1 (2%)
Get out socially?	1 (2%)	22(39%)	32(57%)	1 (2%)
Involved in clubs as previously?	-	21(38%)	25(45%)	10(17%)
As many friends as previously?	6(11%)	39(70%)	9(16%)	2 (4%)
Get on well with friends?	9(16%)	41(73%)	4 (7%)	2 (4%)
Self confidence?	-	22(40%)	33(59%)	1 (2%)
Go out to discos/clubs?	1 (2%)	10(18%)	32(57%)	13(23%)

Table 11(ii): Aspects of normal day-to-day life of the bereaved siblings since the Stardust fire.

Factor	Better (More)	Same	Worse (Less)	Unknown
Ability to cope with tasks?	2 (2%)	70(78%)	18(20%)	1
Get on well with family?	28(31%)	51(57%)	11(12%)	1
Get out socially?	11(12%)	28(32%)	50(56%)	2
Involved in clubs as previously?	9(12%)	32(42%)	35(46%)	15
As many friends as previously?	14(16%)	58(64%)	18(20%)	1
Get on well with friends?	10(11%)	70(79%)	9(10%)	2
Self confidence?	2 (2%)	55(62%)	32(36%)	2
Go out to discos/clubs?	7 (8%)	21(26%)	54(66%)	9

3.1.5 Help and helpful agencies

Following the Stardust fire disaster many statutory and voluntary agencies endeavoured to help those affected. The bereaved relatives evaluation of this help indicated that the help from friends, children and neighbours were perceived as of greatest benefit by the parents [Table 12(i)], and boy- or girl- friends, spouse or friends were of greatest help to the siblings [Table 12(ii)]. Social or community workers were felt by the bereaved to be of least assistance, especially by the siblings. Clergy were

rated as of alot of help by 76% of parents but only 37% of siblings. Hospitals and doctors were given a relatively low rating of being of help by both bereaved parents and siblings. The majority of bereaved parents and siblings, 63% (34/56) and 66% (58/88) respectively had at least one confidant with whom they could discuss all matters.

Table 12(i): Evaluation of help received by bereaved parents after the Stardust fire

Source of help	Alot of help	Some help	No help at all
Parents	50%	23%	40%
Siblings	66%	20%	14%
Spouse	74%	13%	13%
Children	82%	14%	4%
Other relatives	58%	19%	23%
Neighbours	78%	13%	9%
Friends	90%	6%	4%
Clergy/religious	76%	9%	15%
Hospitals/doctors	55%	34%	11%
Social/community workers	32%	19%	49%

Table 12(ii): Evaluation of help received by bereaved siblings after the Stardust fire

Source of help	Alot of help	Some help	No help at all
Parents	55%	14%	31%
Siblings	65%	23%	12%
Spouse	77%	16%	7%
Children	44%	28%	28%
Other relatives	52%	29%	19%
Neighbours	60%	30%	10%
Friends	69%	25%	6%
Boy/girlfriend	83%	10%	7%
Clergy/religious	37%	31.5%	31.5%
Hospitals/doctors	43%	17%	40%
Social/community workers	9%	7%	84%

3.1.6 Religious Practice

The religious practice of the bereaved relatives was also examined and any changes noted. Only 7% (4/56) of parents and 8% (7/91) of siblings described themselves as very religious, 72% (40/56) of parents and 67% (61/91) of siblings as religious and the remaining 21% (12/56) parents and 25% (23/91) siblings as not religious.

Since the Stardust fire 27% (15/56) of the bereaved parents and 26% (24/91) of the siblings felt that they had become more religious, 50% (28/56) of parents and 41% (37/91) of siblings felt that they were unchanged in their religious belief and practice while 23% (13/56) of parents and 33% (30/91) of siblings felt that they were less religious.

3.2 **Hospitalised injured** (n=98):

3.2.1 Demography

Ninety eight people who were hospitalised for more than 24 hours as a result of injuries sustained in the Stardust fire were interviewed between October 21st and December 9th, 1982 (i.e. 20-22 months after the fire).

Of the 98 injured subjects, 56% (55/98) were male and 44% (43/98) were female. The average age of the sample was 21 (±3), range 17-42 years. Ninety percent (88/98) were single, 7% (7/98) were married and 3% (3/98) were separated or divorced.

Data was available on the school leaving age of 99% (97/98) of the hospitalised. The average school leaving age was 16 (±1), range 13-18 years.

The educational standard of the sample was as follows: 9% (9/98) had a primary education only, 77% (76/98) had attended secondary school to Intermediate or Group Certificate standard and 13% (13/98) had remained in school to Leaving Certificate standard.

Forty seven percent (46/98) had a period of further training or formal third level education on leaving school.
The unemployment rate was 18% (14/79) (Table 13).

Table 13: Employment status of the hospitalised respondents.

Employment status	Number (%)
Housewife	10 (11%)
Full-time employment	60 (64%)
Part-time employment	5 (6%)
Unemployed	14 (15%)
Student/trainee	1 (1%)
Retired	3 (3%)

Total 93 (no data on 5 respondents).

3.2.2 General Health

(i) Sixty eight percent (67/98) of the respondents felt that their general health was worse than prior to the Stardust fire, 31% (30/98) felt that their general health was unchanged and only 1% (1/98) felt that their health was now better than before the fire. Specifically, the amount of contact with their family doctor was examined for the 24 months prior to the Stardust fire and compared to the following 20-22 months i.e. the time of interview. In the

two years before the fire 56% (55/98) did not have occasion to visit their general practitioner and the remaining 44% (43%) had an average of 5 (±8), range 1-40 visits. Subsequent to the fire, and over a somewhat shorter time span, the number of hospitalised not seen by their family practitioner had fallen to 15% (15/98) Those who had consulted their family doctor averaged 16 (±20), range 1-98 visits. The rate of attendance at family doctors was compared before and after the Stardust fire and not surprisingly, a highly significant number of the hospitalised had reason to seek consultation with their family doctor ($t=4.6$, $df=139$, $p<0.001$). In the two years before the fire 88% (84/96) of the hospitalised sample had not needed hospital admission. The average duration of hospitalisation of those who were admitted to hospital over this time was 9 (±6), range 1-21 days. Since the fire, 7% (7/98) had not been hospitalised, excluding the fire-related admission, while the hospitalisations among the other respondents averaged 19 (±37), range 1-270 days. When these rates are compared a statistical difference is found ($t=2.6$, $df=101$, $p<0.02$).

3.2.3 Injuries

Injured respondents (both hospitalised and casualty-treated) sustained a variety of fire-related disabilities affecting the eye, skin and respiratory systems. Many of these injuries were of a severity as to require hospitalisation: other injuries which were often no less distressing to the patient were treated in the

casualty department (see Casualty-treated injured, below) The difference between these two patient groups is one of degree rather than type of injury and it is assumed that the more severely injured respondents i.e. the hospitalised, were subject to more severe life threat.

Of the total number of injured respondents i.e. those hospitalised and the casualty-treated, 24% (49/113) reported experiencing a period of loss of consciousness which lasted 147 minutes (2.5 hours) on average. This may well be due to carbon monoxide poisoning (see 4.2.1 Carbon monoxide poisoning).

Although each injury of those hospitalised is documented separately in Appendix G, some of the hospitalised had more than one injury type. Seven percent of the hospitalised (7/96) sustained injuries to their eyes. A description of the burns, the sites affected and their degree indicates that this type of injury was extremely common. However only 11% (11/98) of the hospitalised required skin grafting. Other surgical procedures were carried out on 4% (94/98) of the hospitalised.

Respiratory problems of varying severity arising as a result of the Stardust fire affected a very significant number of those hospitalised following the fire (Table 14).

Table 14: Extent of respiratory problems experienced by those hospitalised following the Stardust fire

Extent of disability	Number affected (%)
Not affected	15 (16%)
Little disability	32 (33%)
Moderate disability	50 (52%)
No information	1

Following discharge from hospital 91% (89/98) were asked to attend the hospital for out-patient follow up.

3.2.4 Psychopathology

(i) The extent of psychological wellbeing of the respondents was non-specifically estimated by enquiring about the necessity to consult a psychiatrist in the two years before the fire and this was then compared to the intervening 20-22 months since the Stardust fire. An account was also sought of any psychiatric contact by injured respondents prior to the study period. Ninety nine percent (97/98) had not had occasion to visit a psychiatrist in the two years before the fire, while the remaining respondent had a total of 24 out-patient visits during that time. Since the fire, the number requiring the assistance of a psychiatrist had increased to 32% (31/95) and on average 6 ($\pm$11), range 1-61 visits

was recorded. Five percent (5/98) of the sample had required psychiatric help prior to the study period.

Of the 93 respondents on whom data are available on psychiatric hospitalisations in the 24 months before the fire, no interviewee had ever been admitted to a psychiatric hospital. In the 20-22 months since the fire however 6% (6/93) spent an average of 21 (±39), range 1-90 days in a psychiatric hospital.

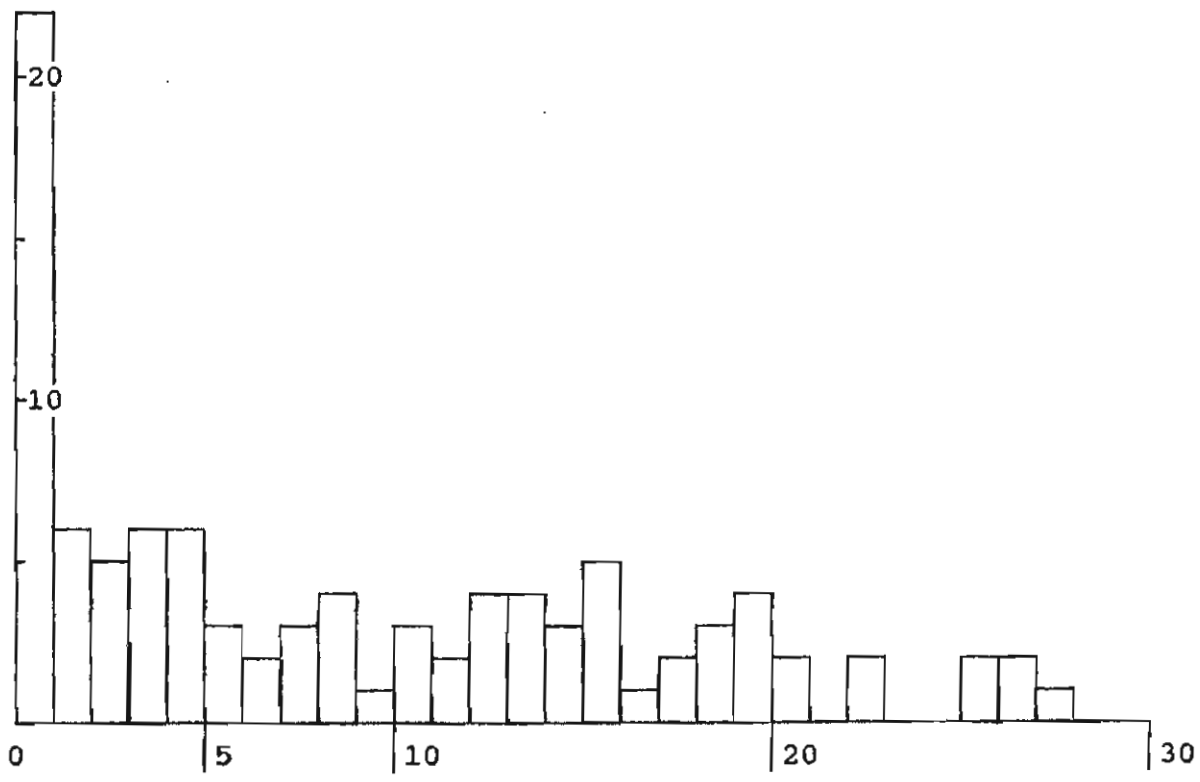
(ii) Present State Examination (PSE):

Eleven percent (11/98) scored zero on the PSE and a further 27% (26/98) scored less than 4 bringing to 38% (37/98) the total number within the normal range determined by this scale. Fifty six percent of female respondents and 62% scored 4 or more. The average score of the entire group of hospitalised respondents was 6 (±4), range 0-19.

(iii) General Health Questionnaire (GHQ-30):

Twenty two percent (22/98) of scored zero on this self-rating scale indicating an absence of psychpathology on the dimensions explored. In all 46% (45/98) scored 4 or less which is within normal limits. Fifty six percent of female hospitalised respondents and 53% male scored more than 5 on the GHQ-30. The average score of the group of hospitalised injured was 8 (±8), range 0-28.

Figure 5: GHQ-30 scores of <u>hospitalised</u> respondents



(iv) Symptom Check List (SCL-90-R)

The scores of items relating to anxiety, hostility, phobic anxiety, and depression deviated from the norm with males affected considerably more than females [Table 15 (i)], characterised the SCL-90-R profile of the hospitalised respondents [Figure 6(i)]. Phobic anxiety symptoms were most markedly deviant for female respondents.

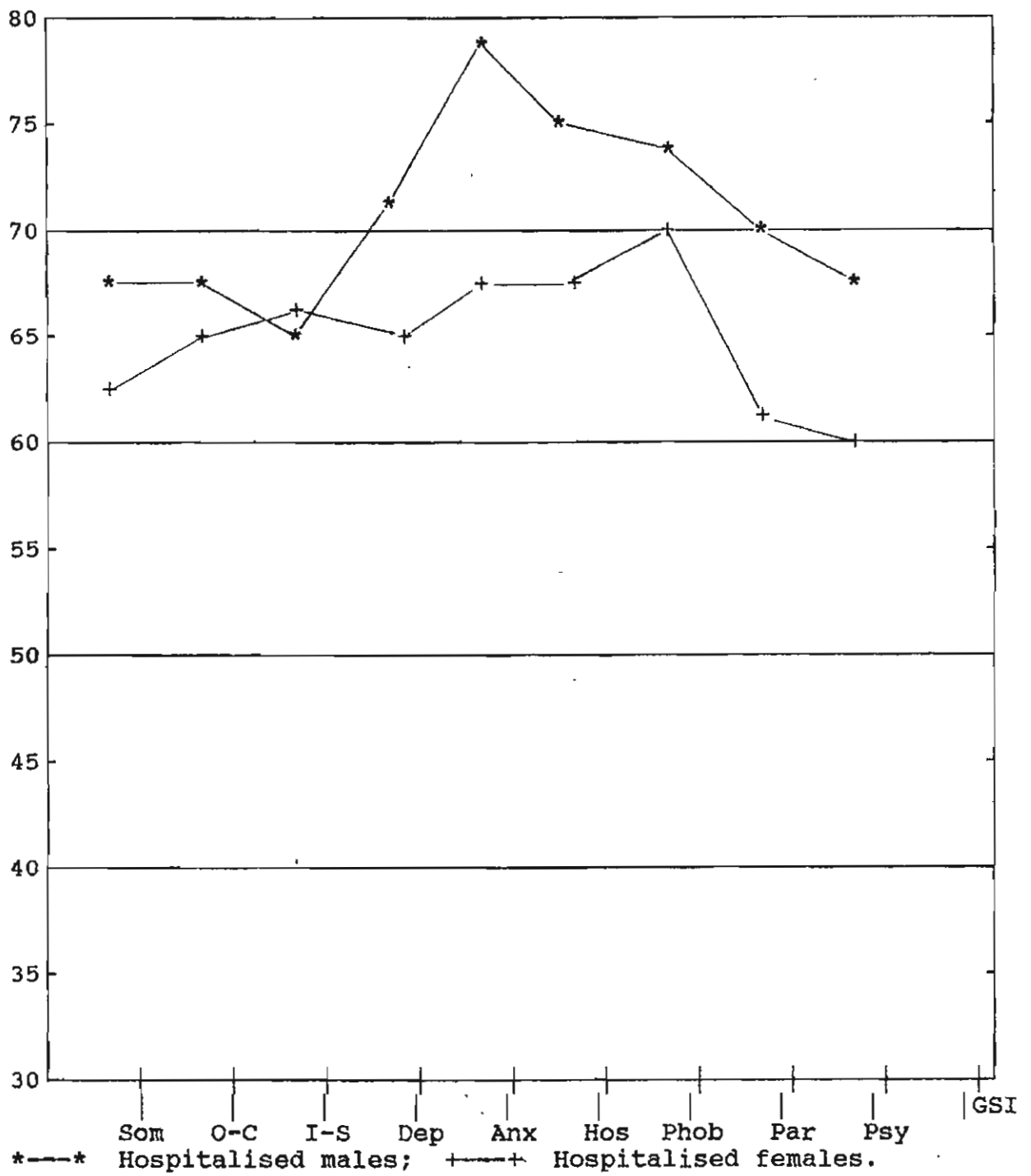
Table 15 (i): Mean SCL-90-R scores of (a) hospitalised males compared to non-patient male norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	68	68	64	71	79	75	74	64	68	
Raw	1.06	1.26	1.01	1.25	1.37	1.29	1.04	1.00	.71	

(b) hospitalised females compared to non-patient female norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	63	65	66	65	68	68	70	61	60	
Raw	1.06	1.24	1.21	1.31	1.42	1.21	1.45	.80	.62	

Figure 6(i): SCL-90-R Symptom Profile (Hospitalised) compared to non-patient norms



(iv) Symptom Check List (SCL-90-R) (continued)

When compared to psychiatric out-patient norms males continue to show deviant scores [Table 15(ii)] especially for measures of phobic anxiety, paranoid ideation and somatisation [Figure 6(ii)]. Females continue to show abnormal measures for phobic anxiety but otherwise profiles compared to female psychiatric out-patients are unremarkable.

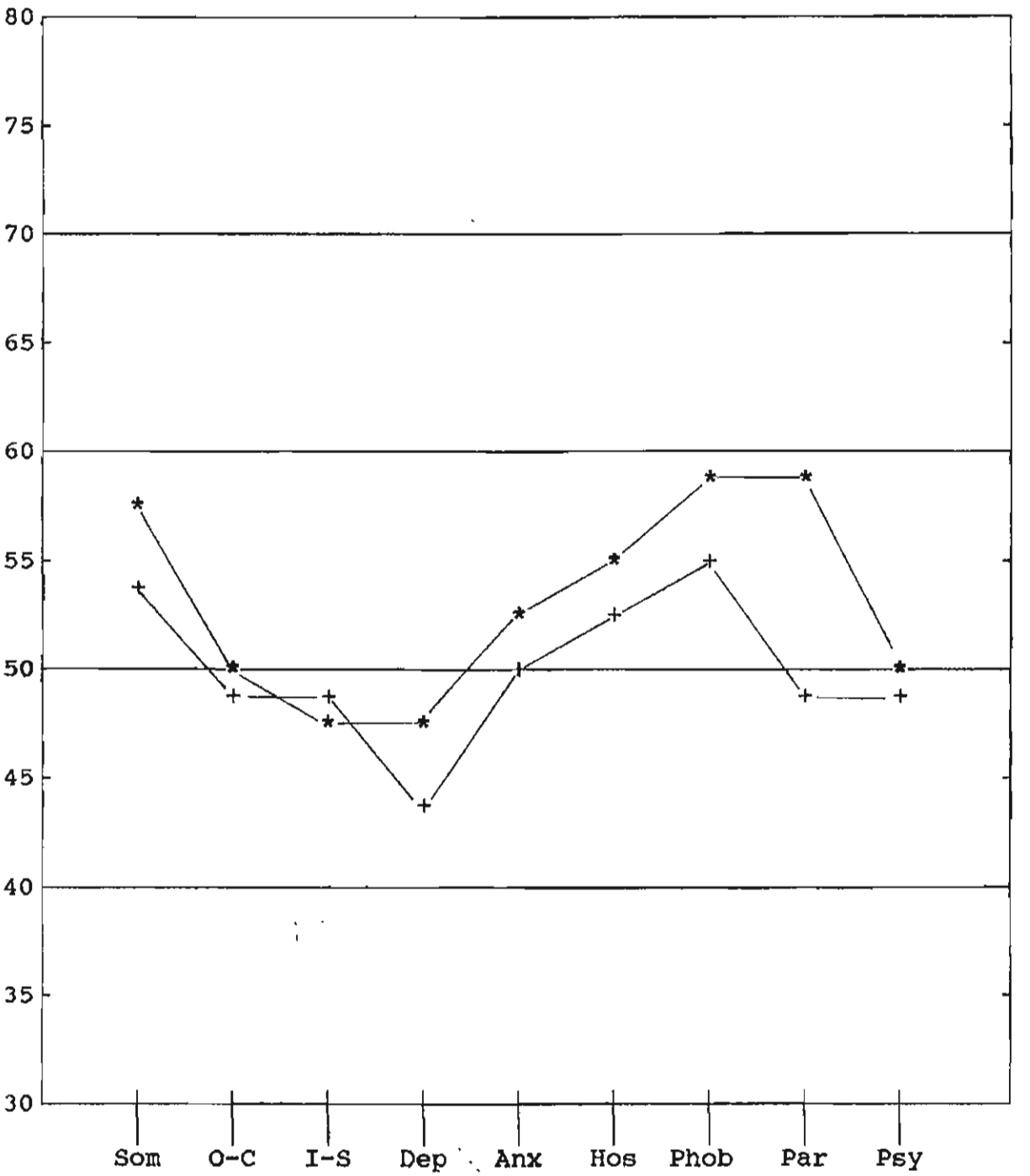
Table 15 (ii): Mean SCL-90-R scores of (a) hospitalised males compared to male psychiatric out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	57	50	47	47	52	55	58	58	50
Raw	1.06	1.26	1.01	1.25	1.37	1.29	1.04	1.00	.71

(b) hospitalised females compared to female out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	53	48	48	44	50	52	55	47	47
Raw	1.06	1.24	1.21	1.31	1.42	1.21	1.45	.80	.62

Figure 6(ii): SCL-90-R Symptom Profile (Hospitalised) compared to psychiatric out-patient norms



(v) Alcohol related behaviour

Twenty percent of those interviewed (20/98) described themselves as non-drinkers. The drinking habits of the injured respondents, and the changes in alcohol usage is shown in Table 16.
The prevalence of problem drinking among the respondents was then examined using the MAST scale. Seventy eight percent (74/98) scored zero on this scale indicating an absence of drink related behaviour. Nine percent (9/95) scored 6 or above on this scale indicative of the extent of problem drinking among this group.

Table 16: Drinking habits of those hospitalised following the Stardust fire.

Status	Number (%)
Non drinker	20 (20%)
Increased alcohol consumption	20 (20%)
Unchanged alcohol consumption	37 (38%)
Decreased alcohol consumption	20 (20%)
Unknown	2 (2%)

3.2.5 Quality of life of the hospitalised

(i) Employment

At the time of the Stardust fire, 69% (68/98) were employed in a full- or part- time capacity, 16% (16/98) were unemployed, 11% (11/98) were students or apprentices and 3% (3/98) were housewives. It took an average of 111 (±122), range 5-393 days after the fire before the hospitalised returned to work (Table 17).

In the year immediately prior to interview, of the 64 respondents on whom data are available the average number of days off work because of illness was 20 (±49), range 1-365 days. Only 22% (14/64) had no sick leave during this period. Sixty six percent (41/62) estimated this to be more than the amount of sick leave they had taken prior to the Stardust fire and 29% (18/62) felt that the amount of sick leave in the previous 12 months was the same as was usual for them.

The effect of the Stardust fire on respondents' work or career was examined. The majority of the hospitalised felt that the fire had a positive effect. The hospitalised survivors views on the impact of the fire on their work prospects is outlined in Table 18.

Table 17: Number of days before returning to work by those hospitalised following the Stardust fire

Time duration	Number (%)
7 days or less	2 (4%)
8-14 days	2 (4%)
15-21 days	6(13%)
22-28 days	3 (7%)
29-168 days	22(48%)
169-240 days	3 (7%)
241-393 days	8(17%)

Average 111 (±112) days Total 46 (no data on 52 respondents)

Table 18: The effect of the Stardust fire on the work or career of those hospitalised

Effect	Number (%)
Positive (beneficial)	40 (46%)
Negative (bad)	18 (20%)
No effect (no change)	22 (26%)
Uncertain	8 (8%)

Total 88 (no data on 10 respondents)

(ii) Sociability & leisure-time activities

A series of general questions relating to respondent's social outlets which give an indication of family and social networks are displayed in Table 19. In general the respondents outside interests were severely curtailed and their ability to "get on" with their family and peer group had deteriorated since they were involved in the Stardust fire.

Table 19: Items relating to social pursuits of hospital-treated respondents

Do you...	Better (More)	Same	Worse (Less)	Unknown
-get on as well with your family as before the fire?	20(29%)	21(30%)	29(41%)	28
-go out as much socially as you did before the fire?	59(61%)	3 (3%)	34(35%)	2
-have the same club & society interests as before the fire?	1 (1%)	30(32%)	67(68%)	0
-have as many friends as you did before the fire?	2 (2%)	42(52%)	38(46%)	16
-get on as well with your friends as before the fire?	0	65(66%)	33(34%)	0
-feel as confident as you did before the fire?	24(25%)	56(57%)	18(18%)	0
-go to discos/socials as frequently as before the fire?	18(20%)	24(27%)	48(53%)	8

3.2.6 Help & helping agencies

Those hospitalised following the Stardust fire had a multiplicity of professional and informal helping organisations involved in their care. Injured respondents were asked to evaluate the extent to which they felt they had been helped by these agencies (Table 20). Parental help followed by that of hospitals/doctors was perceived to be of greatest assistance to the hospitalised with the help available from social/community workers felt to be of least benefit. Sixty one percent (59/98) of the interviewees had at least one confidant with whom they could frankly discuss their troubles.

Table 20: Evaluation by those hospitalised following the Stardust fire of the form of help received.

Source of help	Alot of help	Some help	No help at all
Parents	85%	14%	1%
Siblings	77%	16%	7%
Spouse	67%	-	33%
Children	33%	33%	33%
Other relatives	45%	40%	15%
Neighbours	47%	28%	24%
Friends	69%	25%	6%
Boy/girlfriend	74%	17%	9%
Clergy/religious	37%	28%	35%
Hospitals/doctors	80%	17%	3%
Social/community workers	29%	30%	41%

3.2.7 Religious Practice

The religious practices of the hospitalised were examined as were any changes in religious conviction since involvement in the Stardust fire. Seventy seven percent (75/98) described themselves as religious, 21% (21/98) as not religious at all and the remaining 2% (2/98) as very religious. Thirty two percent (31/98) had become

more religious since the fire, 48% (47/98) had not changed in their religious conviction and the remaining 20% (20/98) felt that they had become less religious.

3.3 **Casualty-treated injured** (n=101).

3.3.1 Demography

This group by definition, comprising 101 respondents, were injured as a result of the Stardust fire and were taken to hospital for treatment, but the injuries sustained were not felt to warrant detention in hospital for a period of longer than 24 hours. Interviews took place between October 21st, 1982 and January 29th, 1983 (20-23 months after the fire).

The interviewees comprised 56% (56/101) males and 44% (45/101) females. The average age of the sample was 22 years (±3), range 17-33 years.

Ninety five percent (95/100) were single and the remaining 5% (5/100) were married. Ninety seven percent lived with their parents.

Half of the interviewees had left school by the age of 15 years. The school leaving age of the respondents is the subject of Table 21.

The educational standard of the respondents indicates that 11% (11/100) had left school with a primary school education, 81% (81/100) remained in school to Intermediate or Group Certificate

level while 8% (8/100) had been educated to Leaving Certificate standard.

Table 21: School leaving age of the casualty-treated respondents.

Age (years) on completion of formal schooling	Number (%) of subjects
13	3 (3%)
14	8 (8%)
15	40 (40%)
16	38 (38%)
17	7 (7%)
18	3 (3%)
19	2 (2%)

Average age: 16 (±1) years.

Sixty six percent of the sample (66/101) were employed in a full- or part- time capacity, 33% (33/101) were unemployed and the remaining interviewees were a student/apprentice and a housewife respectively. Over a quarter of the unemployed (9/33) had been out of work for more than 12 months.

3.3.2 General Health

(i) Fifty two percent (51/99) of the respondents felt that their general health at the time of interview was the same as it had been before the Stardust fire, 46% (46/99) complained of a deterioation in their general health and 2% (2/99) experienced no change. As with the previous groups interviewed, a non-specific indication of general health was given by the amount of general practitioner contact in the 24 months prior to the occurence of the Stardust fire compared to the 20-23 months since. Before the fire 56% (57/101) had not sought a consultation with their family doctor while the remaining 44% (44/101) had an average of 5 (±8), range 1-48 visits. Since the fire 70% (70/100) had an average of 10 (±17), range 1-42 visits. When these consultation rates are compared before and since the fire a statistically significant difference is found ($t=2.14$, $df=113$, $p<0.05$).

In the 24 month period before the Stardust fire 83% (83/101) had not needed hospital admission and the remaining 17% (17/101) respondents had an average of 33 (±84), range 1-365 days of hospitalisation. In the 20-23 month period since the fire 23% of interviewees had spent an average of 5 (±7), range 1-30 days in hospital. No statistical difference is found between these rates of hospital admission ($t=1.4$, $df=40$, NS).

3.3.3 Injuries

The injuries sustained by the casualty treated respondents were understandably less marked than those of the hospitalised injured. None of the casualty treated had eye injuries. All of the burns sustained were of an unspecified, presumed minor, degree and none of the respondents had skin grafting or other operations related to the fire.

When the site of the burns was examined only one site was affected in each discrete body part (Table 22).

Table 22: Location of burns of the casualty-treated respondents

Site of burn	Number affected (%)
Face, head & neck	13 (13%)
Trunk	6 (6%)
Upper limb	8 (8%)
Wrist & hand	16 (16%)
Lower limb	2 (2%)

Seventy four percent (74/99) reported little or no respiratory difficulties following the fire while 26% (26/99) felt that they had moderate to severe breathing problems as a result of their involvement in the Stardust fire.

Thirty five percent (35/100) were asked to attend the hospital following their discharge from the casualty department.

3.3.4 Psychopathology

(i) The amount of contact with the psychiatric services of the casualty-treated was recorded both in the 24 month period before the Stardust fire and in the 20-23 months since. In the 24 months before the fire 98% had no reason to be seen by a psychiatrist, while the remaining two respondents were seen on 20 and 28 occasions respectively. Following the fire, of the 100 respondents on whom information was available, 82% had not been seen by, or sought consultation with a psychiatrist and the remaining 18% had an average of 5 (±10), range 1-42 visits. Five percent had a past history of psychiatric contact.

None of the casualty-treated interviewees had been hospitalised in a psychiatric hospital before the fire and subsequent to the fire to the time of interview and only three respondents had an in-patient spell in a psychiatric facility for one day (2 respondents) and 14 days respectively.

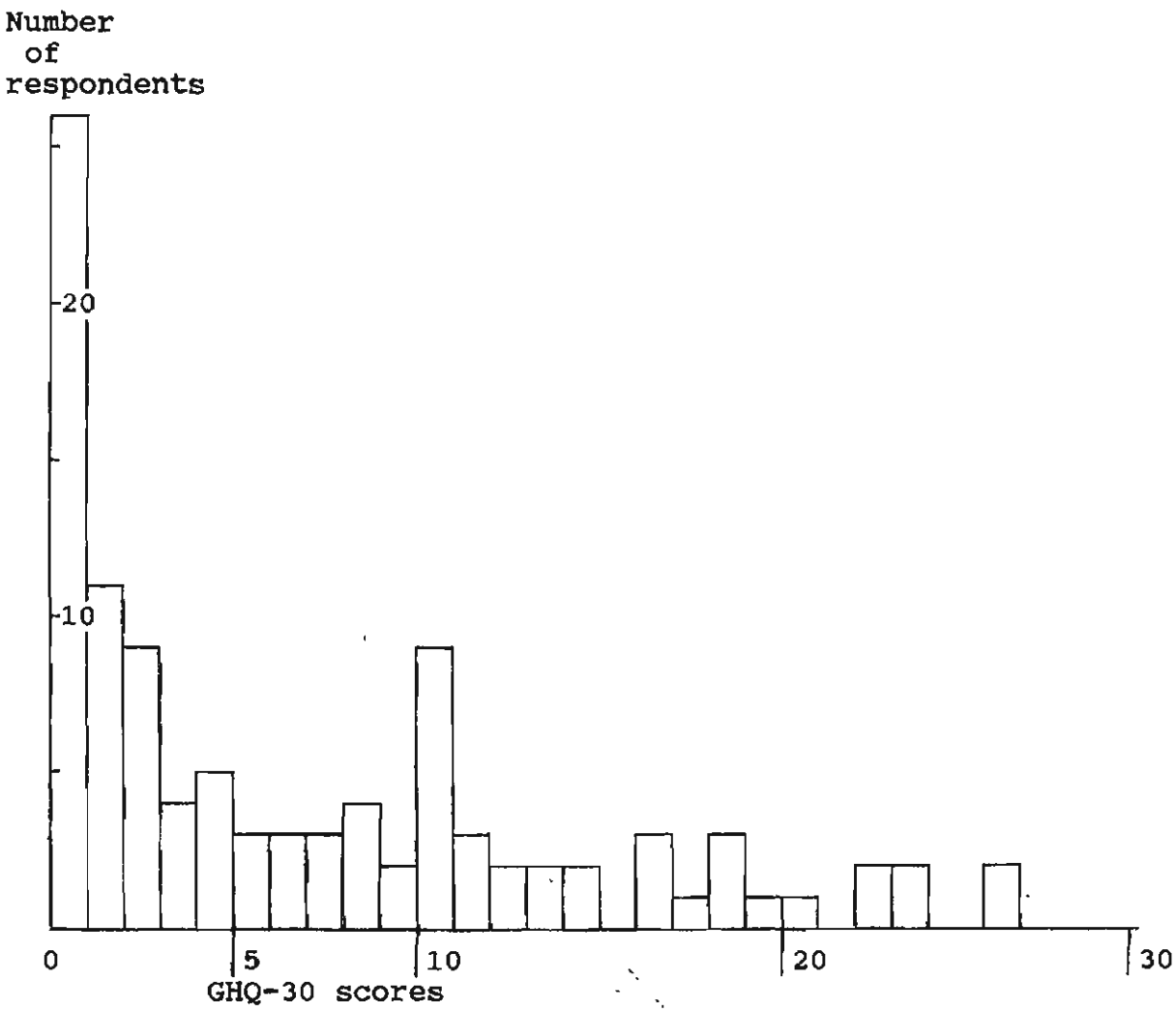
(ii) Present State Examination (PSE)

On this scale 22% (22/100) scored zero and 55% (55/100) scored less than 4 which is within the normal range. Fifty one percent of females and 46% males scored 4 or more. The average score of the respondents was 5 (±5), range 0-20.

(iii) General Health Questionnaire (GHQ-30)

Twenty six percent (26/101) of the respondents had a GHQ-30 score of zero indicating an absence of psychopathology on this scale while a total of 54% scored less than 5 which is within the range of normality (Figure 7). Forty eight percent of the males and 44% of the females scored 5 or more on this scale. The average score of the group of respondents was 6 (±7), range 0-26.

Figure 7: GHQ-30 scores of casualty-treated interviewees



(iv) Symptom Check List (SCL-90-R)

Those treated in casualty scored highly on items relating to anxiety and phobic anxiety when compared to non-patient norms [Table 23(i)]. Females showed a similar although less marked profile [Figure 8(i)].

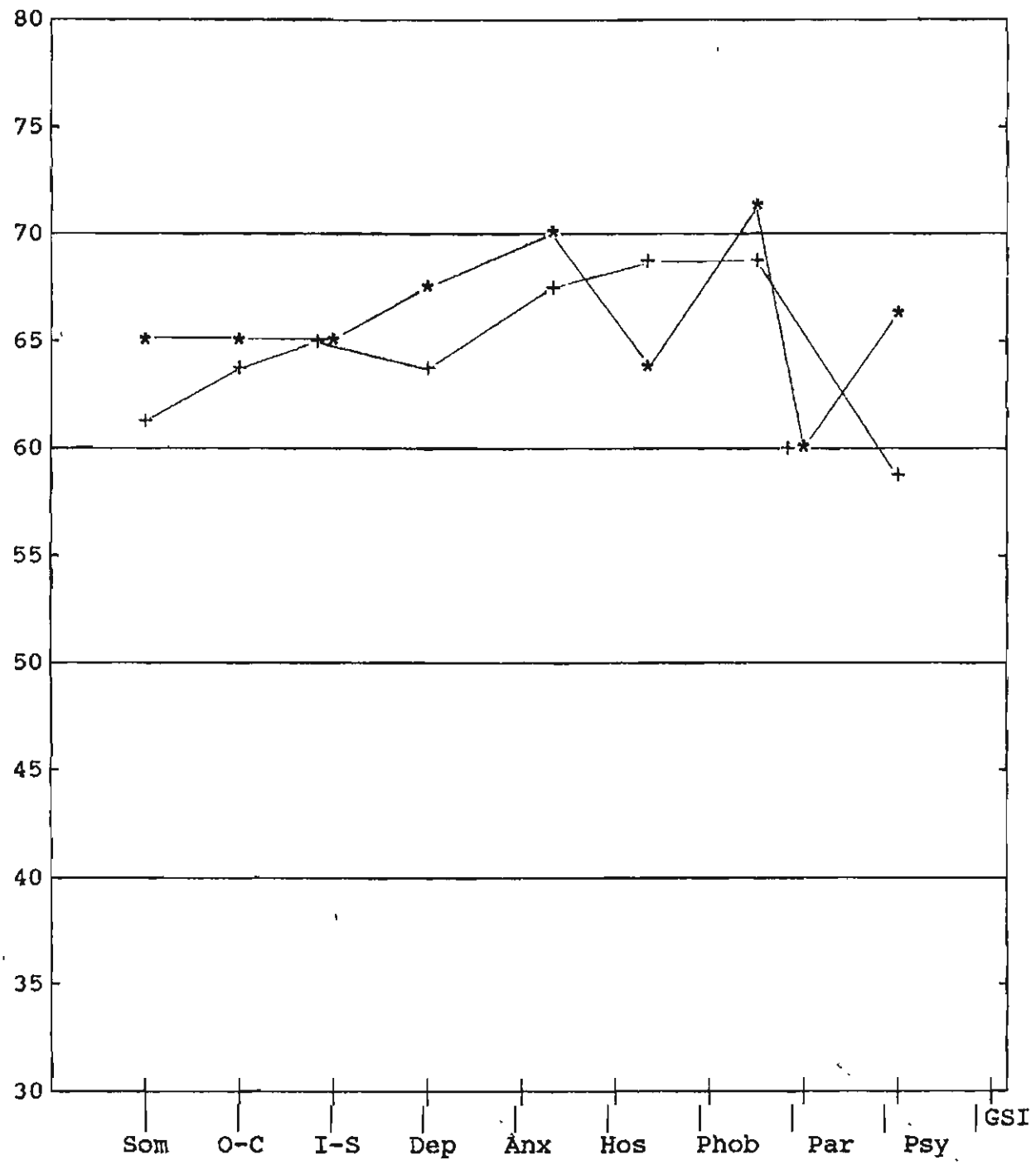
Table 23(i): Mean SCL-90-R scores of casualty-treated (a) males compared to non-patient male norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	65	65	65	67	70	64	71	60	66	
Raw	.86	1.04	.81	.94	1.04	.87	.70	.74	.57	

(b) females compared to non-patient female norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	61	63	65	64	67	68	68	60	58	
Raw	.83	1.04	1.03	1.22	1.23	1.18	1.17	.67	.53	

Figure 8(i): SCL-90-R Symptom Profile (Casualty-treated) compared to non-patient norms



—— Casualty-treated males; +——+ Casualty-treated females.

(iv) Symptom Check List (SCL-90-R) (continued)

When compared to gender-appropriate psychiatric out-patient norms [Table 23(ii)] the casualty-treated continued to show increased measures of phobic anxiety and hostility. Males also showed increased measures of somaticisation while for females increased measures of psychoticism (Psy) were found [Figure 8(ii)]. The psychoticism scale on the SCL-90-R was developed in a fashion to represent the construct as a continuous dimension of human experience. Items indicative of a withdrawn, isolated lifestyle are included, as are first-rank symtoms of schizophrenia, such as hallucinations and thought-broadcasting. The psychoticism scale provides a gradual continuum from mild interpersonal alienation to dramatic evidence of psychosis.

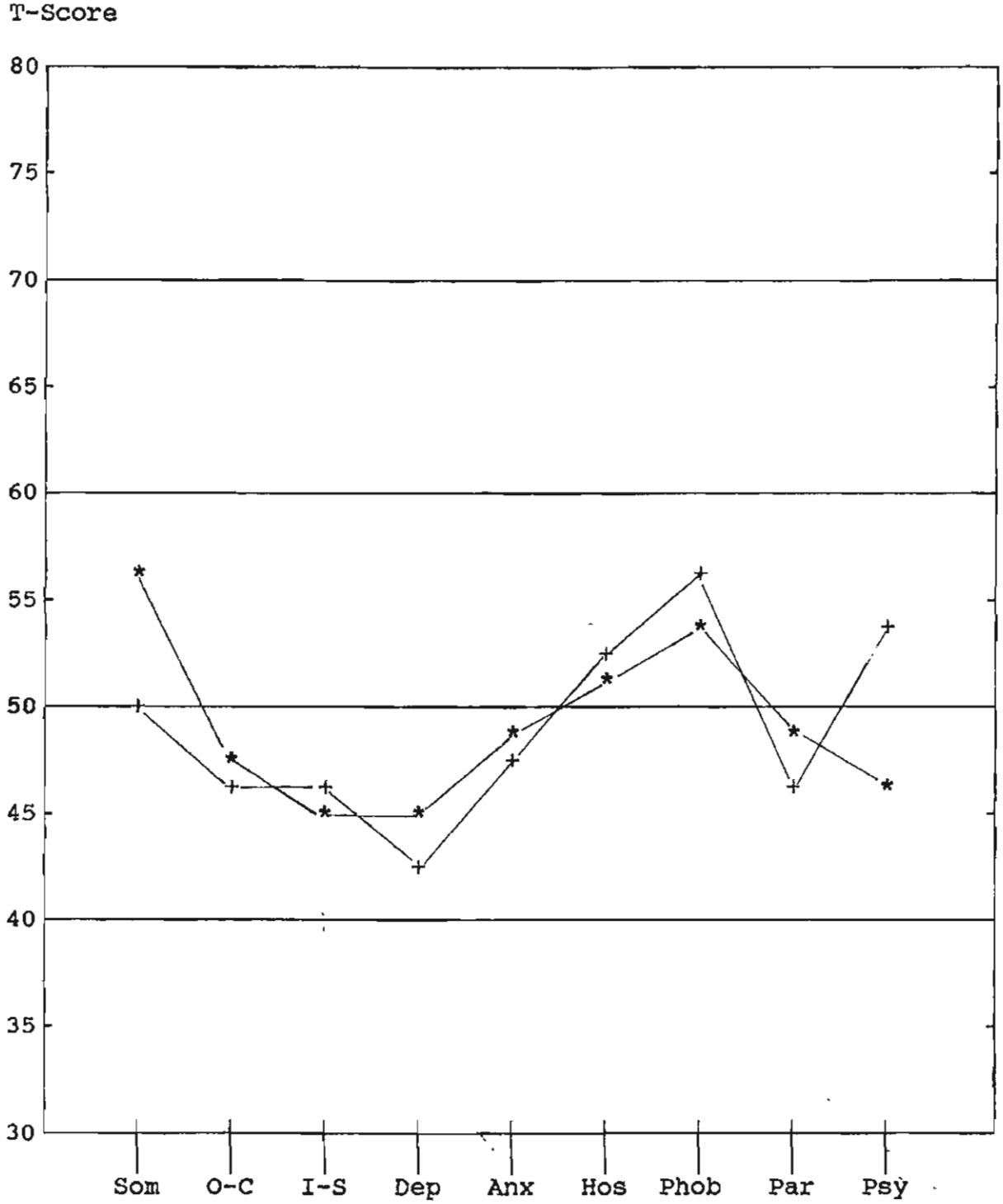
Table 23(ii): SCL-90-R scores of casualty-treated (a) males compared to male psychiatric out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	56	47	45	45	49	51	54	49	49
Raw	.86	1.04	.81	.94	1.04	.87	.70	.74	.57

(b) females compared to female psychiatric out-patient female norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	50	46	46	43	47	52	56	46	53
Raw	.83	1.04	1.03	1.22	1.23	1.18	1.17	.67	.53

Figure 8(ii): SCL-90-R Symptom Profile (Casualty-treated) compared to psychiatric out-patient norms



—— Casualty-treated males; +——+ Casualty-treated females.

(v) Alcohol related behaviour

The amount of alcohol consumed was examined and a MAST score indicative of problem drinking was calculated. Seventeen percent of the respondents were non-drinkers and 33% of the entire group had a similar pattern of alcohol consumption as before the Stardust fire (Table 24).

Table 24: Use of alcohol by the casualty-treated injured victims of the Stardust fire

Alcohol status	Number (%)
Non-drinker	17 (17%)
Increased alcohol consumption since fire	35 (35%)
Same alcohol consumption since fire	33 (33%)
Less alcohol consumption since fire	16 (16%)

Application of the MAST scale indicated that 69% (67/97) scored zero and 5% had a score of greater than 6 which demonstrates problem drinking.

3.3.5 Quality of life of the Casualty-treated injured

Current employment status and leisure-time activities were the main areas explored.

(i) Employment

At the time of the Stardust fire 74% (74/100) of the Casualty-treated were employed in a full-time capacity, 16% (16/100) were unemployed, 9% (9/100) were students/apprentices and 1% (1/100) was a housewife.

After their involvement in the Stardust fire casualty-treated respondents took an average of 16 (±1), range 0-180 days before returning to work (Table 25).

Table 25: Number of days off work taken by Casualty-treated respondents following the Stardust fire

Time duration	Number (%)
7 days or less	38(63%)
8-14 days	8(13%)
15-21 days	5 (8%)
22-28 days	2 (3%)
29-168 days	6(10%)
169-240 days	1 (2%)
Average 16 (±1) days	Total 60 (no data on 41 respondents)

In the 12 months prior to interview 19% (12/65) of those in employment had not any time off work because of illness. The average sick leave among the remaining respondents was 16 (±18),

range 0-90 days. When respondents were asked to compare this with other years, 47% (31/66) felt that this was more than they had taken before the Stardust fire and 44% (29/66) felt that the amount of sick leave taken was the same as usual.

The effect involvement in the Stardust fire had on respondents work and career was felt by 34% (32/95) as positive and 38% denied that the fire had any effect (Table 26).

Table 26: The perceived effect of the Stardust fire on the work and career of those sustaining minor injuries

Effect	Number (%)
Positive (beneficial)	32 (34%)
Negative (bad)	16 (17%)
No effect (no change)	36 (38%)
Uncertain	11 (12%)
Total	95 (no data on 6 respondents)

(ii) Sociability & leisure-time activities

General questions relating to respondents social outlets reveal that they were getting out less than before the fire and their attendence at socials or discos was very much reduced (Table 27).

Table 27: Social pursuits of the casualty-treated respondents

Do you.....	Better (More)	Same	Worse (Less)	Unknown
-get on as well with your family as before the fire?	18(18%)	67(68%)	14(14%)	2
-go out as much socially as you did before the fire?	15(15%)	37(37%)	49(49%)	-
-have the same club & society interests as before the fire?	5 (5%)	43(47%)	44(48%)	9
-have as many friends as you did before the fire?	12(12%)	72(72%)	17(17%)	-
-get on as well with your friends as before the fire?	9 (9%)	83(83%)	9 (9%)	-
-feel as confident as you did before the fire?	4 (4%)	66(66%)	31(31%)	-
-go to discos/socials as frequently as before the fire?	10(10%)	28(28%)	62(62%)	-

3.3.6 Help and helping agencies

The estimated benefit of the various sources of help were documented. Parents, siblings and friends were felt to have helped the most while clergy/religious and social/community workers were found to be of least benefit (Table 28). Seventy five percent

(74/97) of the respondents had a close confiding relationship with someone with whom they could discuss their troubles.

Table 28: Evaluation of help received by the casualty-treated Stardust fire victims

Source of help	Alot of help	Some help	No help
Parents	88%	9%	2%
Siblings	75%	18%	5%
Other relatives	43%	34%	23%
Neighbours	47%	35%	18%
Friends	78%	20%	2%
Boy/girlfriend	72%	16%	12%
Clergy/religious	23%	23%	53%
Hospitals/doctors	46%	46%	7%
Social/community workers	25%	15%	60%

3.3.7 Religious Practice

The religious practice of the respondents was also examined and any change which could be attributed to the occurance of the Stardust fire noted. Four percent (4/101) described themselves as very religious, 77% (78/101) as religious and 19% (19/101) as not

religious. Since the fire 24% felt that they were more religious, 56% (57/101) did not feel that there was any change in their religious behaviour and 20% (20/101) felt that they were less religious.

3.4 **Attenders** (n=50)

A random sample of 50 people who had attended the disco at the Stardust on the night of the fire but who had escaped without injury were interviewed between October 5th, 1982 and March 28th, 1983 (20-25 months after the fire).

3.4.1 Demography

The sex distribution of the respondents was equal and the average age was 20, range 17-43 years. Ninety four percent (47/50) were single and 6% (3/50) were married.

One hundred percent (47/47) were living in their parental home.

The average age on leaving formal education was 15 and one respondent had reputedly left as early as 5 years of age (Table 29).

The educational level of the respondents was: 10% (5/50) who had primary education only, 76% (38/50) had remained in school to Intermediate or Group Certificate level and the remaining 14% (7/50) were educated to Leaving Certificate standard.

Table 29: School leaving age of a random sample of Stardust fire attenders (n=50).

Age on finishing formal schooling	Number (%)
5	1 (2%)
14	6 (12%)
15	20 (40%)
16	12 (24%)
17	9 (18%)
18	2 (4%)
Average age 15 (±2) years	Total 50 (100%)

Sixty percent (30/50) were employed in a full- or part- time capacity and 30% (15/50) were unemployed. The unemployment rate was 33% (15/45). The remaining respondents were housewives and student/apprentices, 4% (2/50) each and 2% (1/50) unspecified.

3.4.2 General Health

(i) Eighty percent (39/49) of the attenders felt that their general health was unchanged by their involvement in the Stardust on the night of the fire and 18% (9/49) felt that their health was worse since then. In the 24 months before the Stardust fire 60% (29/48) of attenders had no occasion to consult with their family doctor and the average number of visits by the remainding 40% (19/48) was

4 (±4), range 1-15. In the 20-25 months since the fire the average number of consultations was 5 (±10), range 1-18, but the number who did not visit their general practitioner had fallen to 33% (16/48). Comparison of these two consultation rates pre- and post- the Stardust fire does not reach statistical significance (t=0.5, df=53, NS).

Ninety percent (45/50) interviewed had not needed an admission to hospital in the 24 months before the fire and compared to hospital admissions since then. The average length of hospital stay before the Stardust fire was 17 (±29), range 1-60 days. Since the fire the average duration of hospitalisation was 12 (±11), days but the number not requiring admittion to hospital had now fallen to 80% (40/50). There was no statistical difference between these two rates of hospital admission (t=0.4, df=13,NS).

3.4.3 Psychopathology

(i) Ninety eight percent (47/48) had not seen a psychiatrist in the 24 months before the Stardust fire and the remaining 2% (1/48) had 4 out-patient consultations. In the 20-25 months since the fire 96% (46/48) had not sought psychiatric consultation and the remaining 4% (2/48) had 4 and 10 consultations respectively. Four percent (2/48) had seen a psychiatrist prior to the study period. None of the 48 respondents had ever been admitted to a psychiatric hospital.

(ii) Present State Examination (PSE)

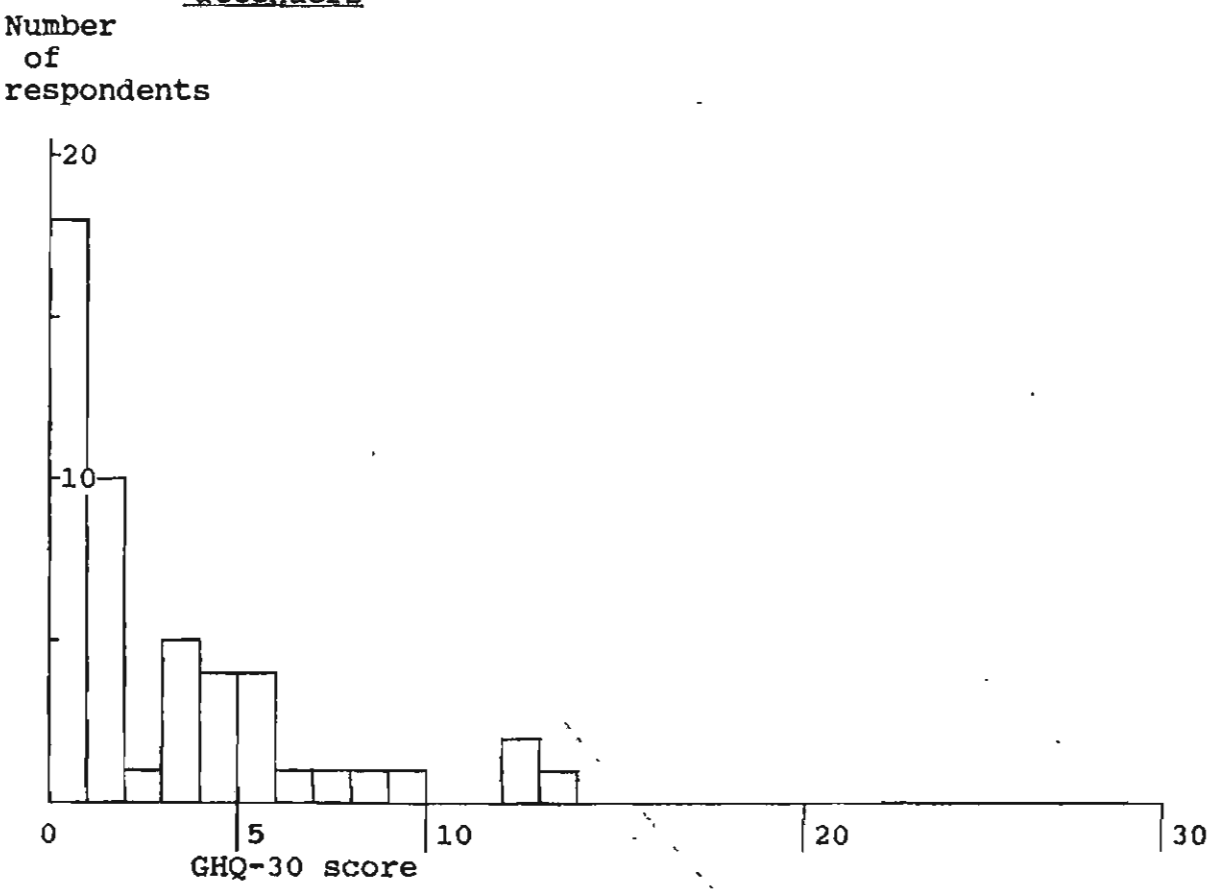
Thirty seven percent (18/49) scored zero on the PSE and a further

42% (16/49) scored less than 4, bringing to 69% (34/49) the total number scoring within the normal range. Forty two percent of females and 20% of males scored 4 or more. Of the entire group the average score was 3 (±3), range 0-13.

(iii) General Health Questionnaire (GHQ-30)

Thirty six percent (18/50) scored zero on this scale and a further 42% (21/50) scored less than 5, which is within the normal range (Figure 9). Twenty percent of males and 24% of females scored 5 or more. The average score was 3 (±5), range 0-22.

Figure 9: GHQ-30 scores of a random sample of Stardust fire attenders



(iv) Symptom Check List (SCL-90-R)

When compared to non-patient norms, the 9-item profiles on this scale approximate those of the non-patient male and female [Table 30(i)]. The item relating to phobic anxiety is the most deviant for both male and females [Figure 10(i)].

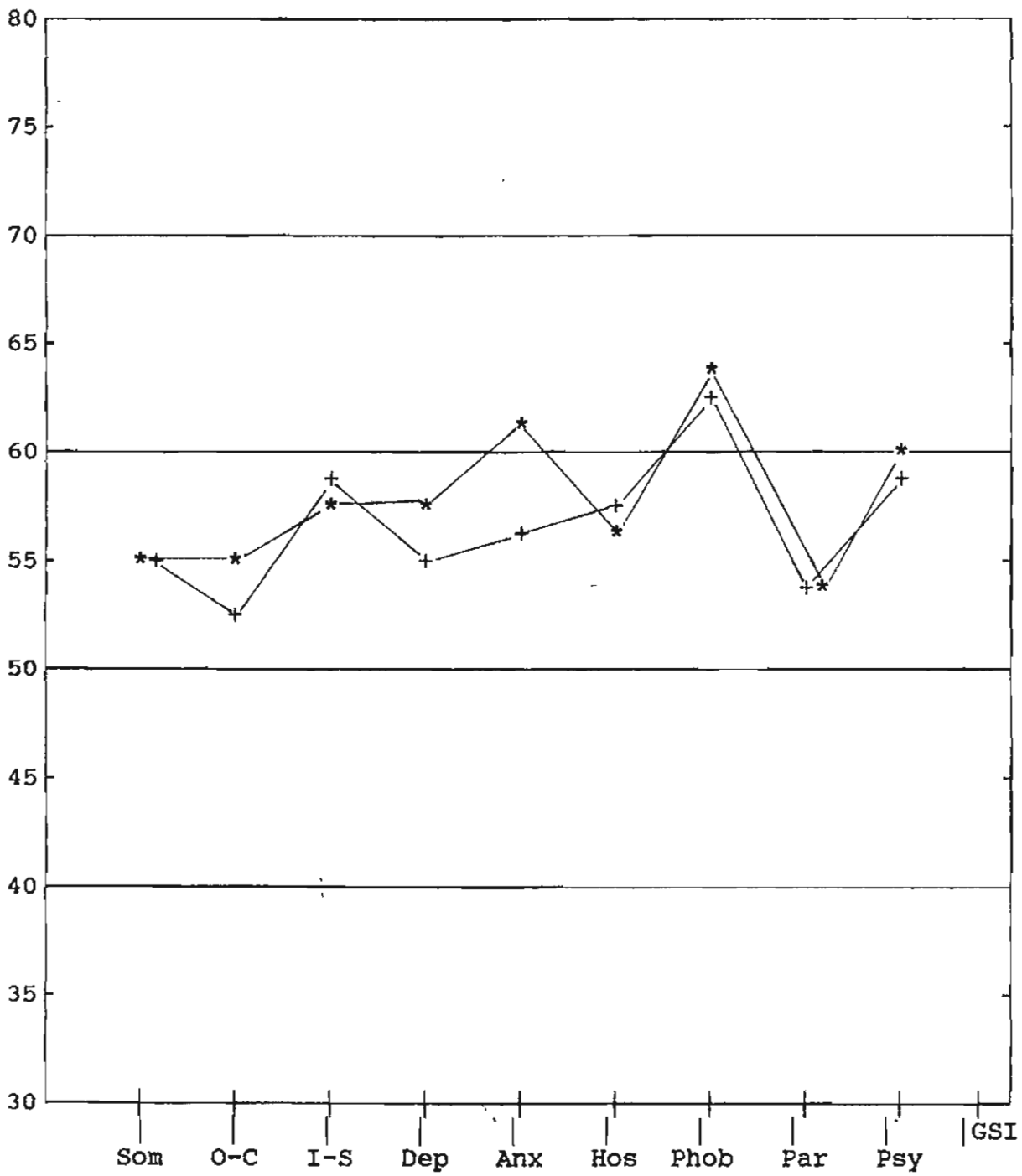
Table 30(i): Mean SCL-90-R scores of (a) attender males compared to non-patient male norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	55	55	57	57	61	57	63	54	60	
Raw	.34	.40	.39	.41	.44	.41	.30	.42	.27	

(ii) SCL-90-R scores of attender females compared to non-patient female norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy	GSI
T	51	53	58	55	56	58	62	53	59	
Raw	.51	.46	.54	.50	.49	.53	.55	.31	.22	

Figure 10(i): SCL-90-R profile of Stardust fire <u>attenders</u> compared to non-patient norms



—— Attender males; +——+ Attender females.

(iv) Symptom Check List (Continued)

When SCL-90-R scores of attenders are compared to gender appropriate psychiatric outpatient norms respondents show less disturbance on all parameters [Table 30 (ii)] & Figure 10 (ii).

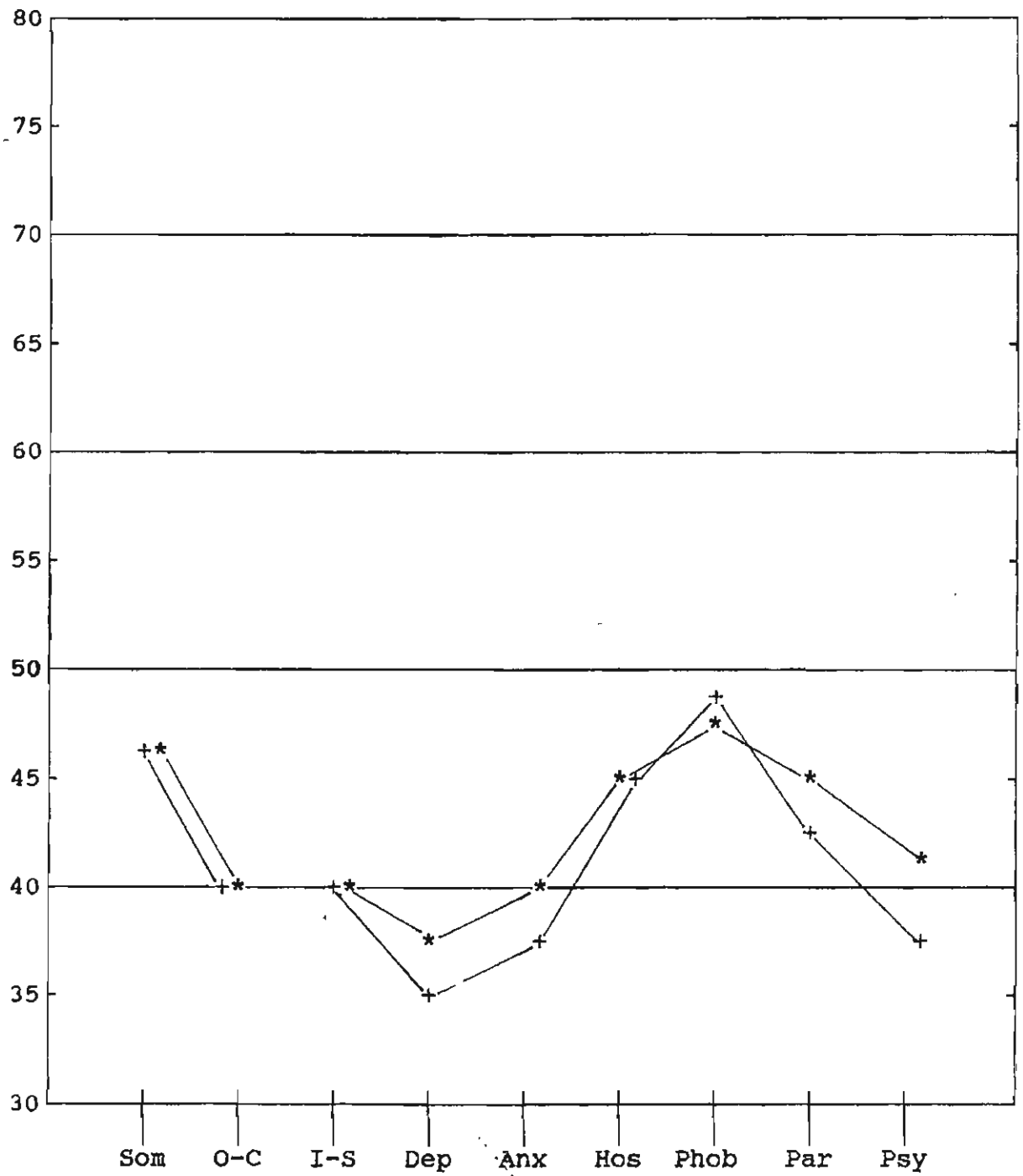
Table 30(ii): Mean SCL-90-R scores of (a) attender males compared to male psychiatric out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	46	39	40	37	40	45	48	45	41
Raw	.34	.40	.39	.41	.44	.41	.30	.42	.27

(b) attender females compared to female psychiatric out-patient norms

	Som	O-C	I-S	Dep	Anx	Hos	Phob	Par	Psy
T	46	40	40	35	37	45	49	42	38
Raw	.51	.46	.54	.50	.49	.53	.55	.31	.22

Figure 10(ii): SCL-90-R profile of Stardust attenders compared to psychiatric out-patient norms



(v) Alcohol related behaviour

Alcohol consumption by respondents was documented and indicated that 8% (4/50) were nondrinkers and that 34% (17/50) were drinking more than they had before their involvement in the Stardust fire (Table 31).

Table 31: Use of alcohol by attenders since the Stardust fire

Alcohol status	Number (%)
Non-drinker	4 (8%)
Increased alcohol consumption since fire	17(34%)
Same alcohol consumption since fire	21(42%)
Less alcohol consumption since fire	8(16%)

Application of the MAST scale showed 85% (41/48) scored zero and only 4% (2/48) had scores above 6 indicative of problem drinking.

3.4.4 Quality of life of attenders

Respondents work performance and leisure-time activities were explored.

(i) Employment

At the time of the Stardust fire 88% (43/49) were in full-time employment, 6% (3/49) were unemployed, 4% (2/49) were trainees and 2% (1/49) were housewives. Following the fire it took an average of 5 (±6), 0-30 days before interviewees returned to work (Table 32).

Table 32: Number of days off work taken by the Stardust attenders before returning to work

Time duration	Number (%)
7 days or less	23 (82%)
8-14 days	4 (14%)
15-21 days	0
22-28 days	0
29+ days	1 (4%)
Average 5 (±6) days	Total 28 (no data on 22 respondents)

When the effect of the fire on the respondents career was documented: 67% (31/47) felt that it had not made any difference and 11% (5/47) felt that the effect was negative (Table 33).

Table 33: Effect of the Stardust fire on the work and career of the attenders

Effect	Number (%)
Positive (beneficial)	6 (13%)
Negative (bad)	5 (11%)
No effect (as before)	31 (67%)
Uncertain	4 (9%)

The amount of sick leave taken by the respondents in the 12 months prior to interview averaged 14 (±19) days with 28% (9/32) of the sample not having any time off because of illness. Thirty three percent (10/30) of interviewees estimated that this was more than the average annual sick leave prior to the Stardust fire and 57% (17/30) of the sample felt that their sick leave requirements were the same as usual.

(ii) Sociability & leisure-time activities

Respondents were asked about their ability to socialise and their interests compared to before their being involved in the Stardust fire. Ability to go out socially had improved in 34% (17/50), the ability to get along with friends was largely unchanged and a significant number were not getting on as well with their family (Table 34).

Table 34: Social pursuits of the those who attended the Stardust fire.

Do you.....	Better (More)	Same	Worse (Less)	Unknown
-get on as well with your family as before the fire?	2 (4%)	2 (4%)	17(34%)	29(58%)
-go out as much socially as before the fire?	37(74%)	1 (4%)	10(20%)	2 (4%)
-have the same club & society interests as before the fire?	1 (2%)	39(78%)	9(18%)	1 (2%)
-have as many friends as you did before the fire?	2 (4%)	36(72%)	5(10%)	7(14%)
-get on as well with your friends as before the fire?	1 (2%)	45(90%)	4(16%)	0
-feel as confident as you did before the fire?	6(12%)	42(84%)	2 (4%)	0
-go to discos/socials as frequently as before the fire?	7(14%)	22(44%)	13(26%)	8(16%)

3.4.5 Help and helping agencies

The estimated benefit of the various helping agencies, as perceived by the respondents was documented (Table 35). Parents, siblings

and friends were found to be of most help to the subjects while hospitals/doctors, social/community workers and clergy of least help. Seventy seven percent (37/48) of the interviewees had a confidant with whom they could discuss their troubles.

Table 35: Evaluation of help by Stardust fire attenders

Source of help	Alot of help	Some help	No help
Parents	83%	15%	2%
Siblings	64%	26%	11%
Other relatives	44%	35%	21%
Neighbours	40%	31%	29%
Friends	67%	29%	4%
Boy/girlfriend	82%	14%	5%
Clergy	10%	21%	69%
Hospital/doctors	6%	28%	67%
Social/community workers	10%	10%	80%

3.4.6 Religious Practice

The religious practice of the respondents was documented and changes in religious practice which could be associated with the Stardust fire noted. Four percent (2/50) described themselves as

very religious, 74% (37/50) as religious and 22% (11/50) as not religious.

Since the fire 22% (11/49) felt that they had become more religious, 67% (33/49) felt that their religious observance was unchanged and the remaining 10% (5/49) were less religious.

3.5 Legal and compensation issues

Legal and compensation issues should be considered in the context of the sequence of events surrounding the Stardust fire (Appendix H).

Among the interviewees 27% of bereaved parents, 8% of the bereaved siblings, 34% of the hospitalised, 22% of the casualty-treated and 14% of the attenders participated in one or more of the committees set up in the aftermath of the Stardust fire.

All of the bereaved parents interviewed had received financial help from the Disaster Fund as had 7% of the bereaved siblings, 95% of the hospitalised, 22% of the casualty-treated and none of the attenders.

Thirty seven percent of the bereaved parents stated an intention to seek compensation, 8% of the bereaved siblings, 93% of the hospitalised, 42% of the casualty-treated and 8% of the attenders.

The decision by the Director of Public Prosecution not to prosecute the owner of the Stardust nightclub met with the agreement of 2% of the bereaved parents, 6% of the bereaved siblings, 11% of the hospitalised, 8% of the casualty-treated and 8% of the attenders.

Respondents were asked their views on the various initiatives set up in the aftermath of the fire. While respondents largely appeared not to have very fixed views i.e. uncertain, responses were skewed in an unfavourable direction in terms of the Tribunal Report and the Government handling of the fire (Table 36).

Table 36: Respondents views on the various initiatives set up in the aftermath of the Stardust fire.

	*1	2	3	4	5
The Disaster Fund					
Bereaved parents:	14%	57%	14%	11%	4%
siblings:	4%	21%	56%	12%	7%
Hospitalised:	8%	26%	28%	14%	25%
Casualty-treated:	7%	31%	31%	22%	9%
Attenders:	8%	22%	56%	12%	2%
The Relatives Committee					
Bereaved parents:	28%	18%	32%	20%	2%
siblings:	13%	32%	46%	7%	2%
Hospitalised:	17%	35%	29%	11%	8%
Casualty-treated:	17%	35%	36%	7%	5%
Attenders:	14%	28%	54%	2%	2%
The Tribunal Report					
Bereaved parents:	6%	9%	43%	21%	21%
siblings:	1%	13%	47%	27%	12%
Hospitalised:	2%	19%	42%	21%	15%
Casualty-treated:	6%	12%	48%	19%	15%
Attenders:	2%	14%	44%	24%	16%
Government Handling of Disaster					
Bereaved parents:	-	5%	16%	20%	59%
siblings:	-	10%	21%	23%	47%
Hospitalised:	1%	12%	20%	12%	55%
Casualty-treated:	1%	13%	26%	27%	33%
Attenders:	-	14%	44%	18%	24%

*Key to Table: 1 = Very favourable; 2 = Favourable; 3 = Uncertain; 4 = Unfavourable; 5 = Very unfavourable.

3.6 Summary of results

So far, results have been presented for each victim group in sequence. It is worth comparing the four groups within the main parameters of the questionnaire. Crossover data was minimal across the groups in that none of those in the hospitalised, casualty-treated or attender categories were also bereaved.

It is assumed that those who were injured by burns or inhalation were more exposed to the effects of fire than a random selection of attenders and it is likely that the greater the degree of physical injury the greater the subjective life threat. For certain factors attenders act as a control population for the hospitalised and the casualty-treated groups as they shared the disaster experience without the physical trauma. In other respects they closely resemble a sample from the general population.

3.6.1 Demography

Males are represented more than females in the study. The bereaved parents group alone had more female than male probands and was also an older group. This group had also less formal education with a significant percentage having primary schooling only. Greater unemployment at the time of interview was found in the casualty-treated and attender subjects (Table 37).

Table 37: Comparison of demographic features of all respondents

	Bereaved (n=147) Parents;siblings	Hospitalised (n=98)	Casualty-treated (n=101)	Attenders (n=50)
Sex ratio (M/F)	0.6;1.4	1.3	1.2	1.00
Age (average)	50;22	21	22	20
+Education(%)	71;24	9	11	10
#U/employed rate(%)	23;20	18	33	30
*U/employed rate(%)	12;13	16	16	6

+refers to primary education only

#percentage unemployed at the time of interview.

*percentage unemployed at the time of the Stardust fire.

3.6.2 General Health

Attendence at general practitioner surgeries was extremely high for all groups since the Stardust fire. Understandably, those injured had the greatest amount of contact with their family doctor and hospital admission (Table 38).

Table 38: General health of respondents since the Stardust fire

[(1) = in the 24 months before the Stardust fire;
(2) = since the Stardust fire.]

	Bereaved (N=147) Parents;siblings	Hospitalised (n=98)	Casualty-treated (n=101)	Attenders (n=50)
GP visits (%)				
(1)	62;35	44	44	40
(2)	82;66	85	70	68
Mean no. GP visits				
(1)	8;4	5	5	4
(2)	16;7	16	10	5
Hospitalised (%)				
(1)	18;18	12	17	10
(2)	12;15	93	23	20

3.6.3 Psychopathology

Since the fire the injured had the greatest percentage who had psychiatric consultation. As a group they also had the greatest percentage with PSE, GHQ-30 and MAST scores which were within the "pathological" range (Table 39), although when groups of

interviewees are seperated by sex the bereaved mothers and sisters have a greater percentage with abnormally high PSE and GHQ-30 scores.

Table 39: Comparative measures of psychopathology in the different groups studied.

[(1) = in the 24 months before the Stardust fire;
(2) = since the Stardust fire.]

	Bereaved (n=147) [Parents;siblings]	Hospitalised (n=98)	Casualty-treated (n=101)	Attenders (n=50)
Psychiatric consults (%)				
(1)	4;0	1	2	2
(2)	21;11	32	18	4
PSE≥4(%)*	54;20	62	46	20
+	63;56	56	51	42
GHQ-30≥5(%)	68;44	54	46	22
SCL-90-R (T-GSI)	*68;63			
	+69;69			
MAST≥6(%)	0;4	9	5	4

* - males; + - females

4. Discussion

It is important to state that the results which have been presented here refer only to those involved in the Stardust fire at a time 20-27 months after the tragedy and may not reflect these peoples' current psychological state.

The percentage of those affected by the fire who consented to interview varied between 64-85% across the different categories of victims (Table 2). There is evidence that resistance in cooperation with investigation is both more frequent and stronger among those more severely exposed to a disaster than among non-affected individuals (Weisaeth 1989). This contrasts with follow-up studies among psychiatric patients where the more healthy have been found to distance themselves from the service and refuse participation in investigations (Retterstol 1966). One can consequently speculate that those who did not agree to cooperate with this study were, perhaps, more affected by the disaster than the interviewees although only anecdotal information is available on their level of function.

The experience of disaster inevitably tests the individual's coping ability and various behavioural responses are brought to into play. There may be distress associated with the experience itself and with the process of adjustment to its consequences. This distress may be so great as to lead to dysfunction, disturbance, disorder, or disease. Or, it may be brief and reactive, settling in the early days or weeks after the experience. For some people the

challenge of disaster, even though distressing, seems to lead to a new and positive process of life adaptation (Raphael 1986). In the present study, despite the psychopathological and other measures indicative of the contrary between 68-80% of the respondents felt that the Stardust fire had a beneficial effect or no effect on their work and career.

In dealing with disaster-related morbidity, it is necessary to consider a multitude of aspects. The different components of psychological health and well-being, and social function which were under examination following the Stardust fire will be discussed:

4.1 Demography

4.1.1 Gender, age and educational factors

In terms of demographic features the bereaved parents are notable in that they are older, have more females than males, have had a lower standard of education i.e. a higher percentage having primary education only, than the other groups interviewed. Their average age of completing schooling i.e. 15 years, is not any different to the other groups of interviewees and is probably related to the advent of free post-primary education in Ireland in 1967, which enabled people to progress to secondary school, but did not necessarily, require that they remain in school longer. It is noteworthy that bereaved siblings, who are of a similar age group to the other victim groups, have twice as many respondents who have

had primary education only as the hospitalised, casualty-treated and attenders. The reason for this is not clear. Education has been shown to have some post-disaster protective effect with the more highly educated having less morbidity (Raphael 1986). The percentage who completed second level education in the Stardust study was only between 4-14%, which would not afford much educational "protection".

There are no consistent findings linking age with vulnerability to mental health problems after a disaster (Raphael 1986). In some studies women have been shown to be at slightly greater risk of developing problems (Abrahams 1976; Weisaeth 1984) but this finding has not been universal. In the Stardust fire study women have been found to have higher indications of psychopathology than males (see 4.4 Psychopathology, below).

4.1.2 Employment factors

The unemployment rates are broadly similar for the bereaved relatives, hospitalised and casualty-treated interviewees at the time of the Stardust fire, and the attenders had a markedly lower rate. The speed with which those involved in the fire returned to work following the disaster indicates that on average, the hospitalised-injured patients took the longest period of time before returning to work and the attenders the least amount of time off work. There is however considerable variation in these rates for the hospitalised as indicated by the large standard deviation

from the mean values. It has been shown following a Norwegian paint factory fire (Weisaeth 1983/1984) that early return to work and social cooperation, despite impaired work function, were helpful factors in enabling workers to cope.

At the time of interview following the Stardust fire, unemployment rates had increased across all the groups with the attenders having the highest percentage increase, followed by the casualty-treated and bereaved parents. Current literature suggests that the unemployed are more at risk of impairment following a disaster (Raphael 1986). Our data does not allow us to examine the effect of unemployment on levels of psychological or social function of the respondents being interviewed.

Those who were hospitalised following the Stardust fire, whom one would expect to have the greatest amount of disability and possibly associated unemployment, had only a marginal increase in their unemployment rate. This may reflect a greater understanding on the part of employers of the hospitalised, and increased tolerence of absenteeism due to illness or injury, than might have been shown to other victims. The large increase in unemployment rates among the casualty-treated and attenders may be explained by the prevailing economic climate of the early 1980's caused an increase in unemployment among "blue collar" workers. The low educational standard of the victim groups would render them occupationally vulnerable and this may be the predominant factor in the increase in unemployment rates found. Respondents in general, apart from the attenders, tended to feel that the Stardust fire had a positive

rather than a negative effect on their work and career. The majority of the attenders felt that the fire had no effect on their employment prospects.

Sick leave in the 12 months prior to interview indicated that across the groups examined all, apart from the attenders, reported more annual sick leave than prior to the fire. The majority of attenders felt that the amount of sick leave taken in the 12 months before interview was no different to usual.

4.1.3 Religious Practice

It has been suggested that religious practices may correlate with how people protect themselves, with those who are more fundamentalist in belief tending to leave things to fate and thus suffering more damage, injury and stress (Raphael 1986). This observation has not, however, been substantiated. The religious observance of the groups studied following the Stardust disaster indicated that the majority of interviewees had not changed in religious practice since the fire. It was not possible to ascertain to what extent people's religious conviction sustained them or influenced their way of coping, although the clergy and religious were only cited as a significant source of help by the bereaved parents. This may reflect a general decline in religious thought and practice among the younger generation interviewed, but the influence of this factor on their overall post-disaster outcome has not been possible to measure.

4.2 General Health

The general health of the majority of bereaved parents and the hospitalised was felt by them to have disimproved since the Stardust fire. Although a sizable percentage of the bereaved siblings and the casualty-treated also complained of a general deterioration in their health, it was not of the same magnitude as the former two groups. The vast majority of the attenders felt that their health was unchanged. Increased morbidity (Clayer 1984; Adams & Adams 1984) and mortality, related to the effects of stress and not to injuries sustained by involvement in the disaster have been described after the Mount St. Helen's ashfall, the Athens earthquake and the Brisbane floods. The morbidity for victims and bereaved have been substantial following a series of fires in nightclubs (Lindemann 1944; Abe 1976; Green et al 1983; Lundin 1984).

All of the post-Stardust fire groups reported an increased attendence at their general practitioner in the 20-27 months since the fire compared to the 24 months before it's occurrence. This reached statistical significance in all but the attender interviewees. It is perhaps to be expected that the bereaved parents, not least because of their age, and the hospitalised, because of the fire-related injuries would have a much greater attendence at their family doctor. The bereaved siblings and the casualty-treated, who sustained only minor physical injuries, also had a marked increase in their attendence at their family doctor

which may be attributed to their being affected in a non-specific way by the fire.

Apart from the hospitalised respondents, other victim groups did not have an increase in hospital admissions after the fire. It is possible that the occurrence of the Stardust fire which involved the declaration and implementation of Dublin hospital's major disaster plan would have suspended all elective hospital admissions for a period of time. This could lead to the non-significant trend to decreased hospitalisations which was found among the non-physically injured interviewees.

4.2.1 Carbon monoxide

Of the fatal victims of the Stardust fire (Report of the Tribunal of Inquiry on the fire at the Stardust, Artane, Dublin, on the 14th February 1981, Chapter 5) approximately one third had a 40% (or potentially lethal) carbon monoxide level in their blood, one sixth had levels of 20% or under while the remainder had intermediate levels. Hydrogen cyanide levels mirrored those in the high group. Carbon monoxide was cited as a cause of death in 19 instances. Only a minority of the injured (n=14) had carbon monoxide estimations evaluated and all of these had been admitted to one hospital. It was impossible to ascertain the time at which these levels were recorded but in all cases but one, levels were below 20%. The fact that 24% of the injured reported that they had a period of unconsciousness further raises the index of suspicion of

carbon monoxide poisoning. Inspection of the psychopathology results in these respondents showed a wide variation and 5/14 had received psychiatric treatment which is a higher than expected figure compared to the injured in general.

Prolonged neuropsychiatric disability has been described in carbon monoxide poisoning (Smith & Brandon 1973; Choi 1983), the level of consciousness on admission being the best predictor of outcome. As coal gas is now rarely used as a source of fuel there are a dearth of studies relating sub-lethal doses of carbon monoxide or hydrogen cyanide to neuropsychiatric effects. Such cases of poisoning occur sporadically due to faulty fires or automobiles but are not rare (Crawford et al 1990). Cases of carbon monoxide poisoning are much more common in major fires and early treatment with 95% oxygen and 5% carbon dioxide is imperative either on site or in casualty departments.

4.3 Responses to Bereavement

Pathological grief reactions appear to be very common following disasters (Raphael 1983; Mc Farlane 1985) and war bereavements (Elizur & Kaffman 1982). These are in part compounded by the effects mediated through other family members. This would also appear to hold in non disaster situations where the parents or family are persistently distressed or depressed (Black & Urbanwicz 1987; Van Eerdewegh et al 1985). It seems fairly clear from the results of the Stardust fire that the family responses must be

looked at in their entirety.

It has been found in disaster situations that bereaved parents are a group for whom it has proved extremely difficult to provide therapeutic interventions (Lacy 1972; Singh & Raphael 1981). The main impediment is the extreme and persistent anger evinced by the parents. The sustained expression of anger is also quite prevalent following a disaster even without the experience of bereavement. In a follow-up study of victims of a factory fire in Norway (Weisaeth 1984), anger and irritability were found to increase over a four year period. This was despite full financial compensation. Inevitably the anger led to impaired relationships (Houts et al 1984; Green et al 1983). The impression remains though, that bereaved parents and families are an even less receptive group (Singh & Raphael 1981) and it could be that they experience greater or more intense anger.

In Aberfan following the coal tip collapse, over 50% of families refused any contact with or intervention from psychiatric services. It is to the credit of those evaluated in the Stardust fire study, and to the continuing favourable perception of the local psychiatric service, that 71% of the parents and over 80% of the injured cooperated in, what was for some, a painful, tiring and lengthy interview.

It would appear that a substantial number of families suffer unduly in bereavement associated with both major and personal disasters and that therapeutic intervention could in theory, alleviate distress particularly when focussed on the family unit. While the

provision of therapy is possible in personal disasters, the possibility of such an intervention following a major disaster where anger and hostility to official helping agencies is frequently both acute and pervasive, is questionable.

A review of intervention studies in adult bereavement found that professional services and professionally supported voluntary and self-help services were capable of reducing from "high" to "low" the risk of psychiatric and psychosomatic disorders (Parkes 1980). The general effect in many studies is one of support that, in other circumstances, would have been provided by a helpful and supportive family.

Parkes found that a counsellor takes at least a year to acquire necessary skills and that they are likely to need more than ordinary sensitivity to acquire an understanding of the nature of grief and the ability to support a person in distress, without themselves becoming overwhelmed. An ability to handle pervasive anger is an essential requirement of those who intervene beyond that of a simple supportive role, as individual workers concerned are likely to become the focus of much of this anger. Casual intervention with untrained helpers, and with uncertain aims, may if anything simply increase the casualty rate (Raphael 1986).

Bereaved parents in the wake of disaster form a discrete group whose needs were not easily met by statutory agencies (Schiff 1979). Consequently, following consultation with a number of interested professionals and parents, a Bereaved Parents Association was set up in 1982, in the aftermath of the Stardust

fire. It is a self-help organisation of bereaved parents with access to professional back-up which is now closely allied with the Bethany Group of bereavement counsellors who operate throughout Ireland.

In the Stardust fire study, parents had greater levels of abnormality than siblings in features relating to bereavement but the patterns of distress closely mirror each other. Items associated with bereavement indicative of symptomatic upset had generally improved between the first and second year after the fire, e.g. appetite, weight and sleep disturbance although curiously restlessness continued to remain high. Components of the bereavement scale relating to people's attitudes to events, e.g. anger and resentment, had not significantly changed on the whole and remained in evidence at the time of interview [Appendix F (i) & (ii)].

High levels of impaired function have been documented following the deaths of children especially those in late adolescence and early adult life (Singh & Raphael 1981; Green et al 1983). The study of Singh & Raphael (1981) found that 45% of bereaved parents suffered general health deterioration, chronic grief and depression with continual preoccupation with the deceased to the extent of impairment of social capacities. This has been borne out in the present study. High levels of anxiety (see SCL-90-R profiles) were also found in these chronically grief-stricken people. Our data does not allow us to examine the association between individual's performance on the SCL-90-R and specific items on the Bereavement

Scale.

4.4 Psychopathology

The rates of psychopathology described following the Stardust fire are much higher than those following the Beverly Hills Supper Club fire (Green et al 1983) and a Norwegian factory explosion (Weisaseth 1989), although the difference in instruments employed may contribute in some way to this difference. The prevalence of "caseness" as defined by the GHQ-30 has been found in cyclones to decrease substantially in the weeks after the disaster: Parker (1977) found that rates dropped from 58-41% in the immediate aftermath compared to four weeks later; Patrick & Patrick (1981) described a decrease in rates from 70-20% in a 1-16 weeks interval. This underlines the marked differences between psychopathological rates in different disasters as the rates of caseness using the GHQ-30 is between 44-68% in the two years after the Stardust fire. In the cyclones cited above there was major life threat but the experience of bereavement and physical injury was considerably less.

In general, morbidity levels tend to cluster around 30-40% at one year when systematic measures are applied which decrease at two years. Psychological morbidity may become persistent and chronic in some individuals. Persistent morbidity of greater than 30% at 2-5 years is found following some man made disasters and rates as high as 60-70% have been reported in marine disaster survivors

(Leopold & Dillon 1963; Henderson & Bostock 1977).

The introduction of the diagnosis of Post-Traumatic Stress Disorder (PTSD) into the psychiatric nomenclature in 1987 (Appendix I) is attributed to the passage of legislation in the USA favouring the Vietnam Veterns (Fuller 1985). It is now recognised as a compensatable disorder both in the United States and in the United Kingdom. Many of the arousable symptoms of PTSD are similar to those of anxiety syndromes. They differ in that the stimulus is definable and idiosyncratic to the identifiable trauma situation. It has been suggested as the nuclear entity in anxiety disorders (Kolb 1989). The core psychopathology of PTSD relates to intrusive phenomena, re-experiencing of the trauma and to specific forms of psychic numbing and phobic avoidance used to deny the impact of this trauma (Lindy et al 1987). In most studies on stress and disasters investigators could give the survivors the diagnosis of PTSD only on retrospective examination of data collected, without the diagnosis as part of the original protocol, and this is the case in the Stardust fire study. However prolonged reactions of anxiety, whether specific post-traumatic stress disorder or other anxiety conditions leading to high levels of morbidity have been found in the wake of disasters (Parker 1977; Patrick & Patrick 1981; Weisaeth 1989). Psychological phenomena such as images and avoidance that occur in the days after the impact of the disaster may be considered post-traumatic reactions. They may not be disorders per se but quite specific reactions to a traumatic

stimulus and may be similar to the grief response following a bereavement - essentially an adaptive and healing process (Raphael 1986). Many of the post-traumatic phenomena involve re-living and re-experiencing what has happened. For some people the reactions experienced will become entrenched or will reappear as a severe and disruptive chronic disorder.

There is evidence favouring the continuity of disorders across a broad range in disasters. Following an earthquake in Romania similar patterns of disorder were found in those who had been well and those who had been psychiatrically disabled prior to the event (Predescu & Niga-Udangiu 1979). Victims of two earthquakes of different intensity in South America were found to have similarities in the frequency and patterns of symptoms although the prevalence of emotional distress varied (Lima et al 1989).

In the 24 months before the Stardust fire formal contact between the victim groups and the psychiatric service was minimal and ranged from 0-4% having occasion to seek out-patient consultation with a psychiatrist. The bereaved parents had the greatest percentage needing psychiatric help. The recognised association between psychopathology and ageing would give rise to this occurrence, even had these parents not suffered a bereavement.

None of the respondents had needed admission to hospital because of psychiatric problems in the two years before the fire.

In the 20-27 months after the fire, out-patient psychiatric

consultations increased across the groups, especially for the hospitalised and the bereaved parents. A small number of respondents, varying from 0-7% across the groups studied, were admitted to a psychiatric hospital. The duration of these admissions was brief, with the majority leaving again within a period of 1-7 days, which is indicative of "crisis intervention" admission. General levels of psychological distress and impairment have been found to cluster around 30-40% for those involved in disasters. Two years after a tragedy levels are generally less but following man-made disasters, such as the Stardust fire, high distress levels have been found to persist (Raphael 1986).

Regarding specific psychopathology, administration of the PSE and GHQ-30 indicated that the bereaved parents had the highest average scores and also the highest percentage of abnormal scores followed by the hospitalised and casualty-treated. Within the bereaved parents group mothers show excessive morbidity on the GHQ-30, PSE and SCL-90-R. All bereaved females were found to be more ill on GHQ-30 measures at the time of interview than any of the hospitalised or casualty-treated respondents. Male bereaved siblings appear to have adjusted well to their loss with GHQ-30 scores approaching those of attenders. It should be noted that the large standard deviations recorded for these tests is an indication of the variability of individual responses. Although there are high rates of morbidity recorded in all three global measures of psychopathology in the treated and injured groups sex differences are not as marked as in those who were bereaved. Burns and

respiratory problems were understandably more serious in the hospitalised than the casualty-treated groups although the scores on measures of psychopathology do not clearly reflect this. It may be that the hospitalised during their in-patient stay were in general more exposed to scrutiny and counselling intervention with ultimate benefit. Analysis of the data so far did not allow relating specific injuries to psychological health. Being injured in a disaster appears to add to the stress but there have not been any systematic studies to evaluate this effect (Raphael 1986). The attenders as a group achieved a score on these tests which merges with the normal population.

The PSE and GHQ-30 scores corresponded closely in delineating abnormal psychopathology. Thus the subject-rating GHQ-30 scale and the objective rating PSE scale serve to substantiate each other. The profound feelings of terror, the choking effects of smoke, heat and poor visibility as victims attempt to clamber over each other to reach exits are all powerful triggers for subsequent traumatic anxiety. This has been borne out by SCL-90-R measures. The SCL-90-R scores and profiles clearly demonstrate an increase in anxiety and phobic anxiety among those physically involved in the Stardust fire, as well as bereaved siblings. Measures of depression were particularly high for the bereaved parents when compared to non-patient population norms. Overall, the Global Severity Index (GSI) derived from the SCL-90-R scores gave a score for bereaved mothers and bereaved sisters which is comparable to the GSI of psychiatric out-patients indicating the extent of their disability.

The GSI scores of male bereaved are above non-patients but well below those of psychiatric out-patients. What data is available on the SCL-90-R suggests that it is a valid indication of PTSD. In the Buffalo Creek disaster (Gleser et al 1981) and in a North Carolina tornado study (Madakasirm & O'Brien 1987) an earlier version of the SCL-90 indicated disaster victims scores on the global and individual dimensions to be equivalent to psychiatric out-patients.

Increased alcohol problems and drug consumption have been described following some disasters (Raphael 1986). It is of interest that the MAST scale indicative of abuse of alcohol consumption gives the lowest percentage of abnormality among the bereaved parents and the highest for the hospitalised. This may be due to the high percentage of females, of an older age group, among the bereaved parents. Traditionally this group would not have a large alcohol consumption nor would they be expected to resort to alcohol as a means of dealing with distress. The specific reason for seeking consultation with a psychiatrist after the Stardust fire was not enquired into and it is possible that abusive drinking behaviour, which is evident from the high MAST scores from a sizable percentage of the hospitalised interviewees may be the reason for the high rate of psychiatric consultation among this group. Although not scoring highly on the MAST score the casualty-treated respondents and the attenders had the highest percentage that reported they were drinking more than before the Stardust fire. This increase in alcohol consumption while it could relate to the

experience of being involved, albeit in a relatively minor way in the fire, is perhaps more likely to be the result of the proportionately large increase in unemployment rate among these two groups of respondents.

4.5 Legal and compensation issues

The issue of compensation may in itself become a source of conflict, interpersonal difficulties, bitterness and stress which can add to the add to the disaster-related morbidity. This is especially so when compensation is sought from particular persons or organisations and delay has been suggested as prolonging or exacerbating morbidity at a conscious or an unconscious level. Claims for abnormal stress and grief in the wake of disasters has been an increasing factor in litigation claims.

Legal history was made when the litigands in the Buffalo Creek disaster were awarded $30,000,000 in settlement. "Litigation anxiety" or "compensation neurosis" has been described by one author as a "state of mind borne out of fear, kept alive by avarice, stimulated by lawyers and cured by the verdict" (Kennedy 1946). This position was strongly supported by Miller (1961) and held sway in medico-legal circles for some decades. However more recent work in disasters shows clearly how little issues of compensation play in influencing morbidity (Leopold & Dillon 1963; Weisaeth 1989). This would also seem to be the case with severe burn injuries (White 1982).

In the Stardust fire study questions relating to compensation received a very poor reception from respondents. In addition it was clear that many genuinely did not know much about prospective claims. Most had little contact with their solicitors and at the time of interview could only be described as in the initial stages of litigation (see Appendix H). Under Irish law persons under the age of 21 years are not entitled to bring a claim for compensation in their own right but have to sue through their parent(s) or legal guardian(s). In many of these cases respondents knew nothing about their claims.

The intention to seek compensation was by no means universal and over 75% of the bereaved expressed a wish not to do so whereas the majority of the physically injured intended to pursue claims.

The Director of Public Prosecucution had indicated an intention not to prosecute the owners of the Stardust complex prior to interview taking place for the Stardust fire study. This was a source of intense anger to many involved and some 97% of the bereaved and 80% of the entire injured interviewees vehemently disagreed with this. This may have coloured the respondents view of the Government's handling of the disaster where two thirds expressed unfavourable views.

It was made clear to the respondents that the survey was directed at health issues and had no input at the legal level, neither had those carrying out the study. Many authors have stressed the fact that post disaster information collected for legal reasons is highly suspect. There is no evidence that issues of compensation

or simulated anger influenced the respondents in this study.

4.6 Social Activities

Social withdrawal has been described as the most frequent form of morbidity in interpersonal relationships (Weisaeth 1983/1984). It may be a consequence of the disaster or precipitated by it in those who are already introverted or those who would use this form of defence to deal with distress. The ability to go out socially was impaired among the bereaved and the injured (both hospitalised and casualty-treated). Injuries sustained in the fire may also have had some bearing on curtailing the activities of the latter. The percentage reporting difficulties in this area vary between 35% (hospitalised) and 57% (bereaved parents). Attenders, in contrast had only 20% who reported an impaired ability to go out socially compared to prior to the Stardust fire. Loss of confidence was also found among a significant percentage of the bereaved parents but was not marked among other victim groups.

4.7 Social Support

Social support and heightened interpersonal closeness have been shown to have a powerful influence in lessening the risk of post-disaster morbidity (Solomon 1984; Green et al 1985). When this is absent or inadequate there is an increased risk of subsequently problems developing. Those who perceived this help as inadequate

were found to be more likely to suffer morbidity (Abrahams et al 1976). In most instances the helping networks are informal (Clayer 1984) and the disruption of these social networks, as occurs following a "central" type of disaster (Green 1981) has a negative impact on outcome. It is likely that the most important members of the social network are family, friends and immediate relatives who take on a special role in providing emotional and informational support that may ameliorate stressor effects (Raphael 1986). Government and other sources have also been shown to be of benefit in lessening the influence of economic misfortune following a disaster (Bolin 1982) and emotional recovery may come only when economic recovery is assured.

Following the Stardust fire, family and friends were perceived by those affected to be the source of most help by those involved in the disaster. The nature of the disaster which essentially affected the residents of a circumscribed area (Appendix A), without damaging the social structure of that area, enabled the affected families and local community networks to consolidate and develop their innate helping skills, which was recognised by the interviewees. The assistance provided by the psychiatric services in being available to "support the supporters" would seem to be justified. To have become precipitously and directly involved with victims and risking the unfavourable perception that the acute distress which inevitably follows disasters such as the Stardust fire also inevitably leads to psychiatric service involvement. Specific counselling and intervention to help with coping and

working through of the stressful disaster experience have been demonstrated to have some mitigating effects (Singh & Raphael 1981) but the most appropriate form of counselling for specific individuals and specific disaster situations need to be carefully defined as substantial morbidity may persist despite intensive work with victims (Terr 1983).

4.8 Conclusions

In the late 1970s the prevailing attitudes towards psychological ill health in disasters are best illustrated by the following quotations:

"Most disaster victims seem to recover fairly well without much in the way of specific help, and long term severe psychological disturbances are not found" (Drayer 1957), and

"There is no clear evidence that disasters produce an increase in neurosis or psychosis and such mental illness" (Beach 1967).

The published comments of Professor McKenna in the Tribunal Report into the Stardust fire (Report of the Tribunal of Inquiry on the Fire at the Stardust, Artane, Dublin, on the 14th February, 1981, pp.194) would have found many, although not universal, adherents. This failure of psychological understanding and the psychiatric need of disaster victims in the extensive literature on disaster planning had been commented on in a major review on disasters nearly a decade before the Stardust fire (Kinston & Rosser 1974). Since then there have been major reviews on the psychological

aspects of disasters (Raphael 1986; Raphael et al 1989). Collaboration between such bodies as the Center for Mental Health Studies in Emergencies of the National Institute of Mental Health in the United States, the World Health Organisation, the Bradford Disaster Research Unit and the International Study Group for Disaster Research all of which are recent developments, should contribute to the development of a data base for disaster related psychosocial morbidity. The Stardust fire study adds substantially to this data. These sources provide direction for the planning of responses of helping agencies and community and national efforts to alleviate morbidity and aid recovery in those most affected by disasters.

The first and most general level of care for victims and communities lies in the recognition by statement or actions that they have suffered from a disaster. This reaction should come from the civil authorities, political and religious leaders, the local community and the media. It is essential that this acknowledgement be maintained beyond the immediate aftermath. Recognition by the authorities that the disaster site has a special significance for the bereaved is important. Adequate provision for an enduring public memorial provides a tangible recognition of the pain suffered and a source of comfort for the bereaved. The strength and capacity to survive of both the individual and the community need to be fostered while offering support and care encourages eventual reinstatement of independence and recovery.

A vital contribution is consultation work with organisations

involved in disaster response. The mental health professional who wants to develop post-disaster services and offer consultancy advice must be seen as trustworthy and as offering something of practical value in the chaos of post-disaster convergence. The authority to intervene will need to be negotiated at national, county and local level with the authorities likely to be responsible and specifically with counter disaster and community leaders. The basic issues needing to be clarified are: what is on offer, to whom, how and why, who will pay the costs and who will be accountable.

A task force to help in planning and implementing mental health services in a disaster needs to to be developed. This should draw on four distinct elements from the community (Cohen & Ahern 1980):

- Expert i.e. mental health professionals.
- Power Group i.e. members of the power structure of the community who can help facilitate decisions for resources and access.
- Sentiment Groups i.e. groups reflecting broad values of the community who are likely to be concerned for its needs and who may block programmes if not involved.
- Needs Groups i.e. victims who have experienced the problems directly.

There are many difficulties in outreach programmes (Lindy et al 1983; Singh & Raphael 1981). Many of those in need may be reluctant to make contact or may not perceive their needs as related to mental health services (McFarlane 1986). The presentation of such services as stress crisis-intervention or

post-disaster counselling may be more acceptable rather than "psychiatric help", which for many people seems to carry some stigma or inference of personal inadequacy.

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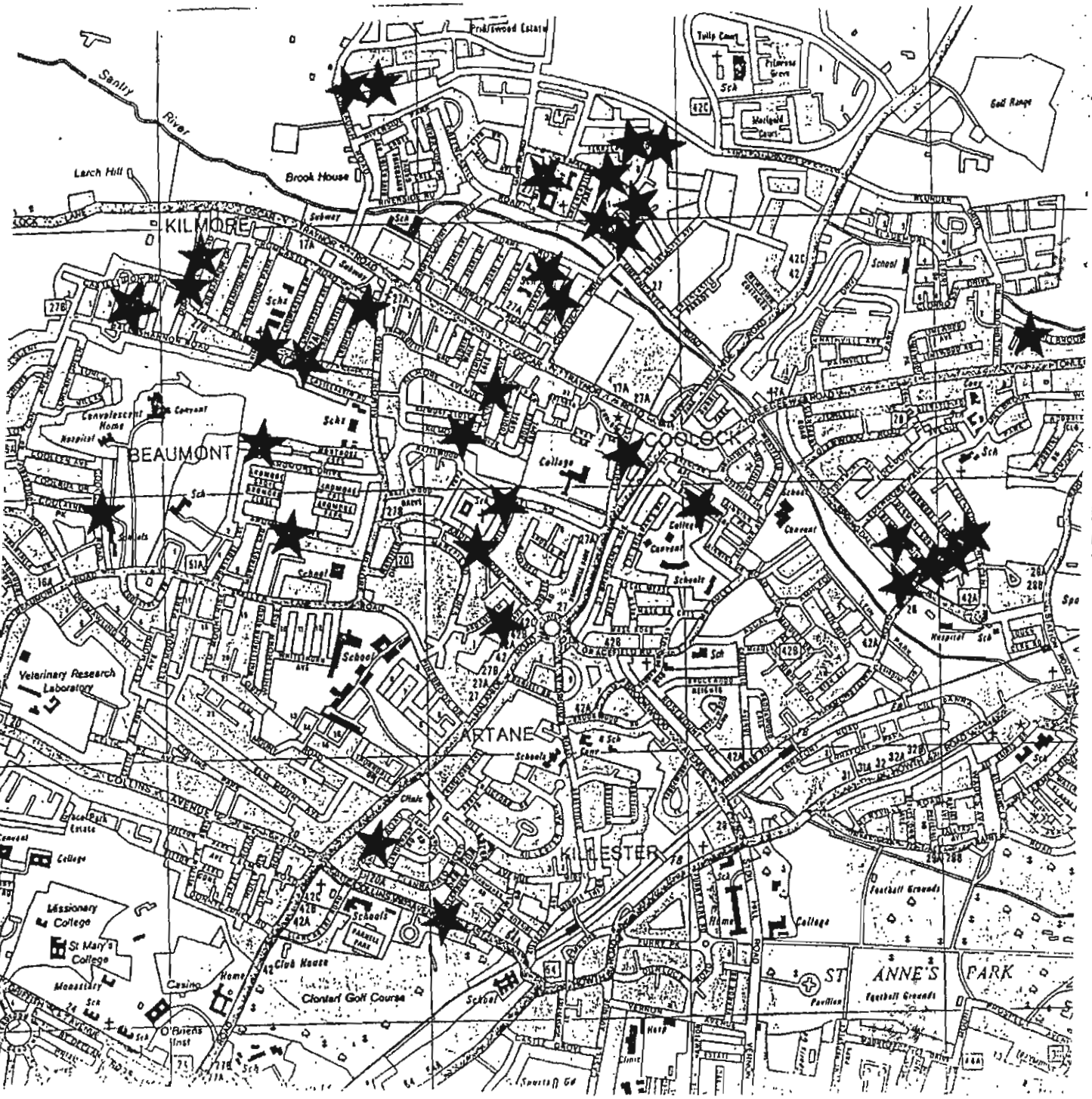
Appendix A



The domiciles of 38 of the victims of the Stardust fire are shown.

Appendix B

Present State Examination (PSE), 10-item scale* (Wing et al 1974)

I should like to get some idea of how you have been getting along during the past month. To begin with, I'd like to ask you a few general questions about how you have been feeling lately and particularly about any changes you have noticed in yourself in the past month or so.

[Key to scoring answers: No=0; Yes=1 (less than 50% time) ; Yes=2 (more than 50% of the time), for the 10 questions below].

-Have you been worrying about anything lately? Can you put your worries out of your mind when you want to get on with something?

-Have you had headaches or other aches and pains?

-Have you been particularly on edge or irritable lately?

-Have there been times lately when you have been very nervous, anxious or frightened about anything? Do you avoid anything that makes you nervous?

-Have you been able to think clearly and concentrate as well as usual?

-Have you been depressed lately? Have you lost interest in your work or your enjoyment of things?

-Have you been eating and sleeping all right?

-Have you lost your self-confidence with other people lately? Have you been very self-conscious?

-Have you been repeatedly checking things that you have already done? Is that because you forget?

-Is there anything else that has been bothering you lately? Specify:-

*NOTE: Total score of 4 or more indicative of "caseness".

Appendix C

General Health Questionnaire (GHQ-30) (Goldberg et al 1970)

We would like to know if you have had any medical complaints and how your health has been in general over the past few weeks. Please answer all the questions on the following pages simply by indicating which answer most clearly applies to you. Remember that we want to know about present and recent complaints, not those that you have had in the past.

It is important that you answer all the questions.

(Please tick the appropriate spaces).

Variable Number Have you recently:-	Better than/ same as usual	Less than/ much less than usual
1. Been able to concentrate on whatever you are doing?	.....	.....
2. Felt that you are playing a useful part in things?	.....	.....
3. Felt capable of making decisions about things?	.....	.....
4. Been able to enjoy your normal day-to day activities?	.....	.....
5. Been able to face up to your problems?	.....	.....
6. Been feeling reasonably happy all things considered?	.....	.....

Variable Number Have you recently:-	Better than/ same as usual	Less than/ much less than usual
7. Been managing to keep yourself busy and occupied?	.....	.....
8. Been getting out of the house as much as usual?	.....	.....
9. Been feeling on the whole that you were doing things well?	.....	.....
10. Been satisfied with the way you have carried out your tasks?	.....	.....
11.Been managing as well as most people would in your shoes?	.....	.....
12. Been able to feel warmth and affection for those near to you?	.....	.....
13. Been finding it easy to get on with other people?	.....	.....
14. Spent much time chatting with people?	.....	.....
15. Been feeling hopeful about your future?	.....	.....
16. Lost much sleep over worry?	.....	.....
17. Felt constantly under strain?	.....	.....
18. Felt that you could'nt overcome your difficulties?	.....	.....

Variable Number Have you recently:-	Better than/ same as usual	Less than/ much less than usual
19. Been feeling unhappy and depressed?	.....	.....
20. Been losing confidence and depressed?	.....	.....
21. Been thinking of yourself as a worthless person?	.....	.....
22. Been taking things hard?	.....	.....
23. Found everthing getting on top of you?	.....	.....
24. Been feeling nervous and strung up all the time?	.....	.....
25. Found that at times you could'nt do anything because your nerves were too bad?	.....	.....
26. Been having restless, disturbed nights?	.....	.....
27. Been finding life a struggle all the time?	.....	.....
28. Been getting scared and panicky for no good reason?	.....	.....
29. Felt that life is entirely hopeless?	.....	.....
30. Felt that life is not worth living?	.....	.....

Appendix D

The Brief Michigan Alcohol Screening Test (MAST)*.

	Yes/No
-Do you feel that you are a normal drinker?	0/2
-Does your wife, husband, parent or other near relative ever worry or complain about your drinking?	1/0
-Do you ever feel guilty about your drinking?	1/0
-Do friends or relatives think that you are a normal drinker?	0/2
-Are you able to stop drinking when you wish?	0/2
-Have you ever attended a meeting of Alcoholics Annonymous?	5/0
-Has drinking ever created problems between you and your wife, husband, parent or other near relative?	2/0
-Have you ever got into trouble at work because of drink?	2/0
-Have you ever neglected your obligations, family or your work for two or more days in a row because of drink?	2/0
-Have you ever gone to anyone for help because of drink?	5/0
-Have you ever been in hospital because of drinking?	5/0
-Have you ever been arrested for drunken driving, driving while intoxicated or driving under the influence of alcoholic beverages?	2/0

	Yes/No
-Have you ever been arrested, even for a few hours because of other drunken behaviour?	2/0

*NOTE: Total score of 6 or more is indicative of problem drinking

Appendix E

Bereavement Scale (Reproduced)

The following are a list of things people who lose someone close to them often experience. We would like you to put an "X" on each line at the point which best describes the extent to which you experienced that particular feeling. The first line represents the extent to which you experienced that feeling during the first year, the second line the extent to which you experienced that feeling since the first anniversary. The lines are scored from "0" - <u>not at all</u> to "10"- <u>very much or extremely</u>. (These lines are not shown to scale, below).

<u>During the first year</u>	<u>Since the first anniversary</u>
1. Have you been preoccupied with painful thoughts and memories of ----------	
not----------very	not----------very
at all much	at all much
2. Did you have fits of crying?	
not----------very	not----------very
at all much	at all much
3. Have you found it difficult to accept that ------ is dead?	
not----------very	not----------very
at all much	at all much

During the first year		Since the first anniversary	
4. Did you lose your appetite?			
not----------	very	not----------	very
at all	much	at all	much
5. Did you lose weight?			
not----------	very	not----------	very
at all	much	at all	much
6. Were you conscious of -------'s presence in familiar places so much so that you had to remind yourself that he/she was dead?			
not----------	very	not----------	very
at all	much	at all	much
7. Has -------'s death seemed unreal to you?			
not----------	very	not----------	very
at all	much	at all	much
8. Have you found it difficult to get a good nights sleep?			
not----------	very	not----------	very
at all	much	at all	much

During the first year		Since the first anniversary	
9. Have you had dreams in which ------ appeared very alive and real?			
not	very	not	very
at all	much	at all	much
10. Have you found it difficult to concentrate on whatever you were doing?			
not	very	not	very
at all	much	at all	much
11. Were you cross and irritable with others?			
not	very	not	very
at all	much	at all	much
12. Since the death have you avoided certain things, places or activities because they remind you of----------?			
not	very	not	very
at all	much	at all	much
13. Have you felt that you could'nt cope?			
not	very	not	very
at all	much	at all	much

During the first year		Since the first anniversary	

14. Did you get upset when you thought about----------?

not	very	not	very
at all	much	at all	much

15. Have you felt that life is meaningless?

not	very	not	very
at all	much	at all	much

16. Have you blamed yourself for what has happened?

not	very	not	very
at all	much	at all	much

17. Have you imagined that you were in a similar situation or in some way suffering in a similar way to ----------?

not	very	not	very
at all	much	at all	much

18. Did you get upset at the anniversary of the death and/or at times that have a special meaning i.e. birthdays?

not	very	not	very
at all	much	at all	much

During the first year | Since the first anniversary

19. Have you had recurrent nightmares which involve ----------?

not----------very not----------very

at all much at all much

20. How do you see ----------? Was he/she like most of us, good and bad or was he/she different i.e. extremely good

fairly----------extremely fairly----------extremely

average good average good

21. Have you found yourself behaving like ------- e.g. talking, dressing, walking or in some way taking on some of his/her characteristics?

not----------very not----------very

at all much at all much

22. Have you found your relationships with others under strain?

not----------very not----------very

at all much at all much

23. Have you had difficulty in remembering things?

not----------very not----------very

at all much at all much

During the first year | Since the first anniversary

24. Have you felt so restless that you could'nt sit still?

not----------very | not----------very

at all much | at all much

25. Did you ever get panicky e.g. times when you started to shake or tremble, your heart pounded and you felt hot and you had to do something about it e.g. leaving the room, getting off a bus or approaching someone for help?

not----------very | not----------very

at all much | at all much

26. Did you lose contact with friends and relations?

not----------very | not----------very

at all much | at all much

27. Have reminders of -------- ever brought on an acutely distressing and physically painful attacks with breathelessness, pining and a feeling as if your heart was going to burst?

not----------very | not----------very

at all much | at all much

During the first year | Since the first anniversary

28. Was there anything to do with the death that made you feel guilty?

not----------very | not----------very
at all | much | at all | much

29. Did you feel anger and resentment that ---------- should have died?

not----------very | not----------very
at all | much | at all | much

30. Have you found yourself directing your anger at specific people? e.g. either family members, clergy, government, owners of nightclub?

not----------very | not----------very
at all | much | at all | much

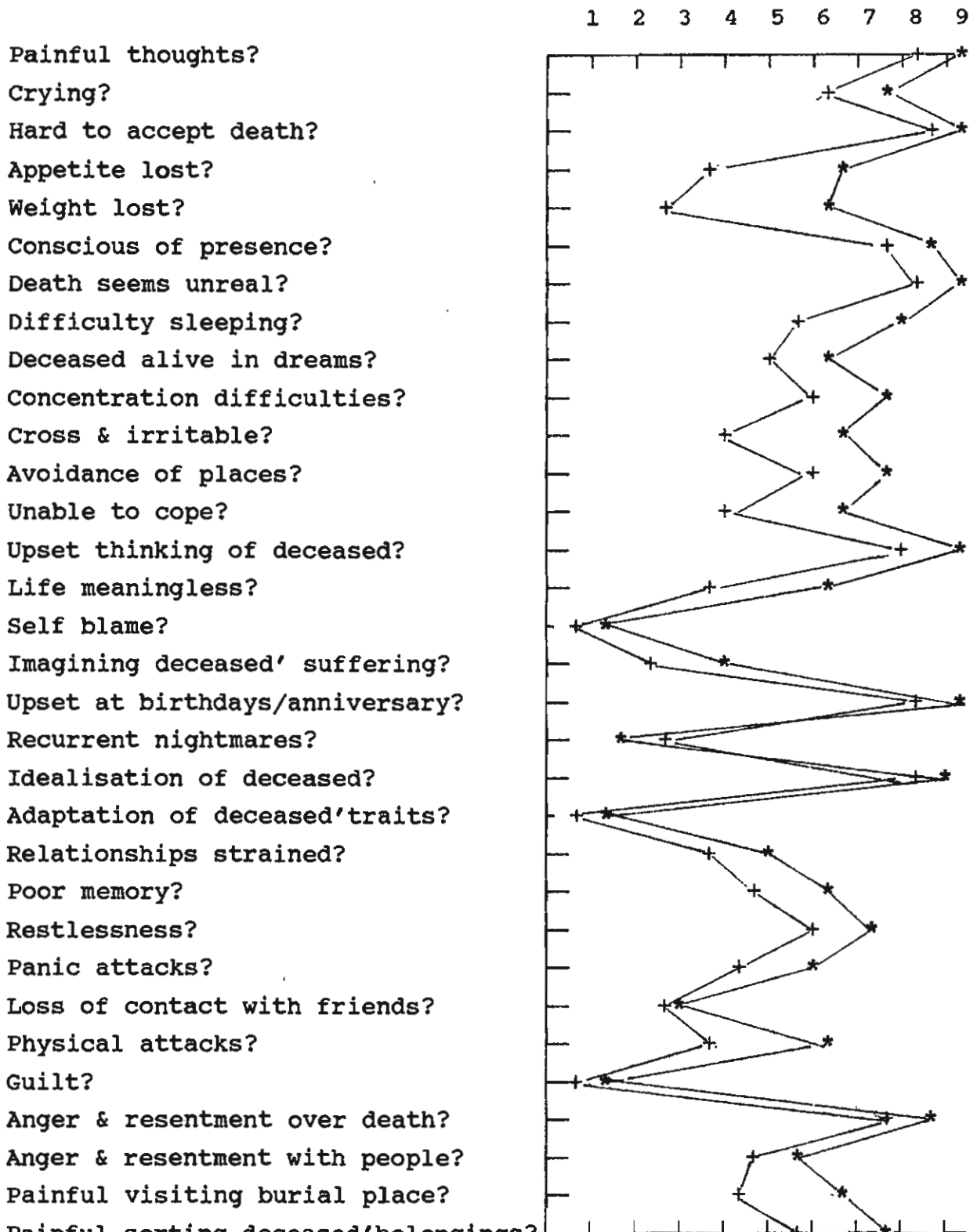
31. Have you found it painful to visit the burial place?

not----------very | not----------very
at all | much | at all | much

32. Did you find it difficult to sort through ----------'s belongings?

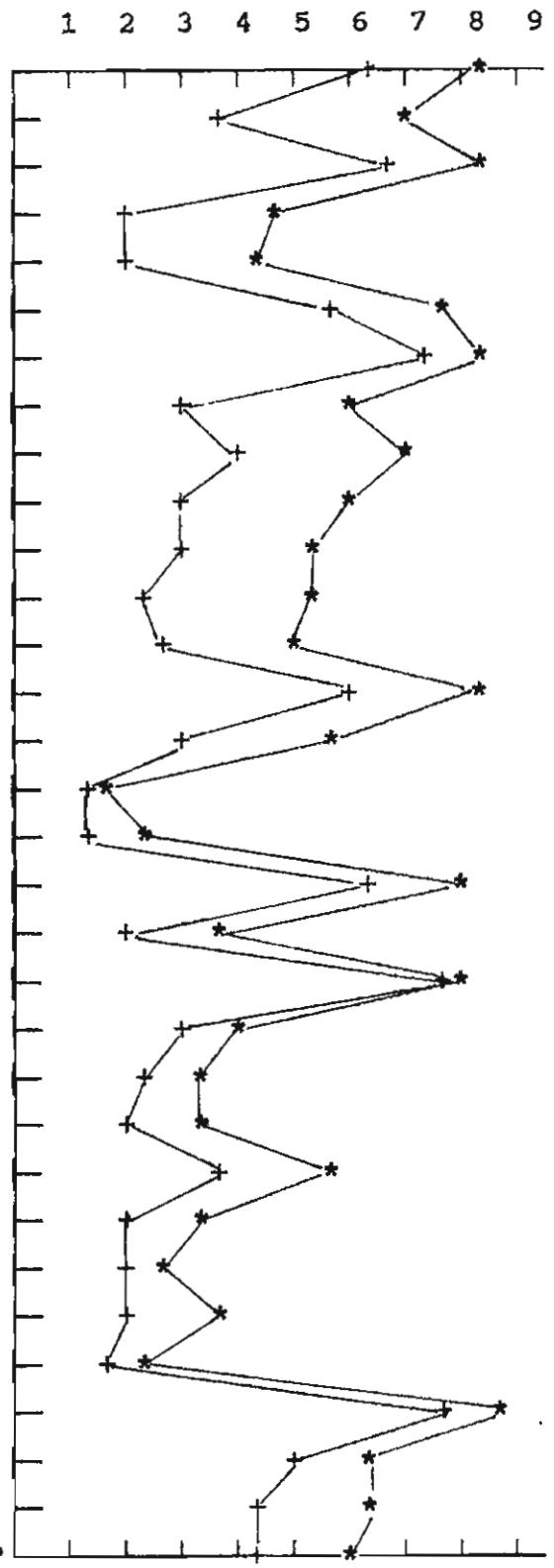
not----------very | not----------very
at all | much | at all | much

Appendix F (i): **Bereavement Analogue Items Scale (Parents)**



—— during the first year; +——+ since the second anniversary

Appendix F(ii): **Bereavement Analogue Items Scale (Siblings)**



* - * during the first year; + - + since the second anniversary

Appendix G

Injuries sustained by those hospitalised for more than 24 hours after the Stardust Club fire.

(i) Burns to face, head & neck

Description of burns		Number affected (%)
No burns		57 (59%)
Burns affecting one site	- degree not specified	11 (11%)
	- first degree	10 (10%)
	- second degree	10 (10%)
	- third degree	3 (3%)
Burns affecting two sites	- degree not specified	2 (2%)
	- first degree	2 (2%)
	- second degree	2 (2%)
No information		1

(ii) Burns to upper limb

Description of burns	Number affected (%)
No burns	67 (69%)
Burns in one site - degree not specified	4 (4%)
Burns in one site - first degree	2 (2%)
- second degree	2 (2%)
- third degree	1 (1%)
Burns in two sites - degree not specified	5 (5%)
- first degree	6 (6%)
- second degree	8 (8%)
- third degree	2 (2%)
No information	1

(iii) Burns to trunk

Description of burns	Number affected (%)
No burns	78 (80%)
Burns in one site - degree not specified	4 (4%)
- first degree	3 (3%)
- second degree	3 (3%)
- third degree	4 (4%)
Burns in two sites - degree not specified	2 (2%)
- first degree	0
- second degree	3 (3%)
No information	1

(iv) Burns to wrist & hand

Description of burns	Number affected (%)
No burns	52 (54%)
Burns to one site - degree not specified	3 (3%)
Burns to one site - first degree	4 (4%)
- second degree	3 (3%)
- third degree	2 (2%)
Burns to two sites - degree not specified	3 (3%)
- first degree	3 (3%)
- second degree	22 (23%)
- third degree	5 (5%)
No information	1

(v) Burns to lower limb

Description of burns	Number affected (%)
No burns	92 (95%)
Burns in two sites - degree not specified	2 (2%)
- first degree	2 (2%)
- third degree	1 (1%)
No information	1

Appendix H

Catalogue of events occuring in the aftermath of the Stardust fire:

- **February 14th 1981:-** fire at the Stardust, Artane with the loss of 48 lives and physical injuries to approximately 240 young people.
- **February 15th 1981:-** Public inquiry into the Stardust fire announced by the Government in the form of a Tribunal under the provisions of the Tribunal of Inquiry (Evidence) Act 1921 & 1979.
- **February 20th 1981:-** Mr Justice Ronan Keane nominated as the sole member of the Government appointed Tribunal.
- **June 30th 1982:-** Report of the Tribunal of Inquiry on the Fire at the Stardust, Artane, Dublin, on the 14th February 1981 submitted to the Minister of the Environment. The main points of interest to this study were:

-5.22: There was no evidence of crush injuries, trampling, "panic" injuries or significant exit accidents. All of the injuries found were consistent with those which would be sustained from heat and smoke (Mr. Prendeville, plastic surgeon and five other surgeons in evidence to the Tribunal).

-5.28: The possibility raised of a post-traumatic neurosis in some of those involved in the fire where there might be a vulnerable personality with an already incipient neurosis.

In the majority of cases the fire would become an unhappy memory, and would not lead to any radical changes in their life style. In the same way grief reactions to the deaths of close friends or members of a family should run their course, as the victim adjusted to the new state of affairs (Professor J. McKenna based on interviews with 24 survivors of the Stardust fire).

-9.14: The fire was probably caused maliciously.

-9.27: Dublin Corporation failed to take necessary steps to ensure Building Bye-laws and Public Resort Bye-laws were implemented.

-9.28: The owners of the Stardust did not take due precautions for the safety of the public, performers or employees.

Exit doors were persistently locked and chained.

Means of escape were not kept unobstructed.

Employees were not allocated specified duties to be performed in the event of fire and fire drills were never held on the premises.

-10.15: Costs of legal representation for the next-of-kin was allowed for two firms of solicitors (later increased to three).

-Summer 1982:- The Director of Public Prosecutions decided not to prosecute the owners of the Stardust. There were numerous court cases at this time as the owners sought to re-open the Stardust. A liquor and snooker licence was obtained for other parts of the Stardust complex but permission was not granted to re-open the fire site. Re-opening was strongly opposed by the relatives and supported in this by the Eastern Health Board psychiatric representative.

-Autumn 1982 - early Summer 1983:- Those involved in the Stardust fire interviewed as part of the study into the psychiatric consequences for the bereaved relatives and the injured following the fire.

-Summer 1983:- Owners of the Stardust awarded half a million pounds in compensation for malicious damage which caused the Stardust fire.

-Spring 1984:- Claims for damages were made to the Industrial Tribunal by 120 individuals of whom 20 were bereaved. Most of the bereaved families had issued legal writs against the owners of the Stardust and Dublin Corporation. The owners were insured for only $250,000.

1985-'86:- The Attorney General, Mr Murray instituted a special Government Tribunal to assess damages and costs to all affected. Approximately $10,000,000 was disimbursed.

-**February 14th 1991:-** Relatives committee state that there is still a lack of public and Government recognition of the Stardust tragedy with no adequate memorial.

Appendix I

DSM-111-R criteria for post-traumatic stress disorder (PTSD) (American Psychiatric Association 1987).

A. The person has experienced an event that is outside the range of usual human experience and that would be markedly distressing to almost anyone, e.g., serious threat to one's life or physical integrity; serious threat or harm to one's children, spouse or other close relatives and friends; sudden desruction of one's home or community; or seeing another person who has recently been, or is being, seriously injured or killed as the result of an accident or physical violence.

B. The traumatic event is being persistently reexperienced in at least one of the following ways:
1. recurrent and intrusive distressing recollections of the event (in young children, repetitive play in which themes or aspects of the trauma are expressed)
2. recurrent distressing dreams of the event
3. sudden acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and those dissociative [flashback] episodes, even those that occur upon awakening or when intoxicated).
4. intense psychological distress at exposure to events that symbolize or resemble an aspect of the traumatic event, including anniversaries of the trauma

C. Persistent avoidance of stimuli associated with the trauma or numbling of general responsiveness (not present before the trauma), as indicated by at least three of the following:
1. efforts to avoid thoughts or feelings associated with the trauma
2. efforts to avoid activities or situations that arouse recollections of the trauma

3. inability to recall an important aspect of the trauma (psychogenic amnesia)
4. markedly diminished interest in significant activities (in young children, loss of recently acquired developmental skills such as toilet training or language skills)
5. feeling of detachment or estrangement from others
6. restricted range of affect, eg., unable to have loving feelings
7. sense of a foreshortened future, e.g., does not expect to have a career, marriage, or children, or a long life

D. Persistent symptoms of increased arousal (not persistent before the trauma), as indicated by at least two of the following:
1. difficulty in falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilance
5. exaggerated startle response
6. physiologic reactivity upon exposure to events that symbolize or resemble an aspect of the traumatic event (e.g., a woman who was raped in an elevator breaks out in a sweat when entering any elevator)

E. Duration of the disturbance (symptoms in B,C,and D) of at least one month.