

PTSD DISORDER IN PRIMARY SCHOOL CHILDREN FOLLOWING A
NATURAL DISASTER

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INTRODUCTION

Children attracted particular attention after the Ash Wednesday fires in South Australia. They were the focus of concern of many community groups, parents and health professionals because of the magnitude of the distress they experienced, in the context of their developmental vulnerability. The fires commenced at the time most children were at school, so that many were separated from their parents at the time the fires passed. Others were exposed to a major threat when they were on school buses in the fire affected areas at the time the fires were at their height. There are also a number of indirect stresses for these children. Apart from their parents' own preoccupation with their exposure to the fires, in the early days after the event the parents were busy attempting to cope with the practical and psychological dilemmas associated with their losses. Similarly, a number of long term stresses such as relocation and the prolonged effects of reconstruction will have had an impact on this population.

Despite the face validity of these concerns, there is continuing controversy about the impact of disasters on the victims including children and some investigators deny that serious psychological effects occur. Ziv and Israeli for example studied the children from seven kibbutzim which had sustained frequent enemy shelling over a lengthy period and contrary to expectation found no significant differences of anxiety symptoms on these kibbutzim when compared with non bombarded ones. This research had concentrated on the immediate impact phase of a stressful event. A study (Burke) which had both a before and after measure of a group of children, found that five months after a severe winter storm, the levels of behavioural disturbance in a group of primary school children were not significantly increased although certain sub-groups were identified to be adversely affected by their experience. Burke and others have noted that even the best studies looking at the effects of disasters on children have relied on general opinion surveys of observers or parents and that often after natural disasters parents deny that their children have problems. They confirm the presence of parental denial in their study. This indicates the importance of reliable and even multiple measures of distress in children. Milne, studying the effects of Cyclone Tracy on Darwin children, found that the longer term effects were particularly noticeable in the children of families that had been evacuated and had not returned. Such studies have depended on measures of symptomatic distress. The clinical relevance of these findings has been difficult to establish. Terr who has conducted a four year follow up on 25 school children kidnapped at Chowchilla has indicated the importance of looking at the developmental effects of being exposed to a disaster rather than simply focusing on symptoms.

She has found that these children demonstrated continued preoccupation with the traumatic event, emotional constriction and a negative perception of the future in themselves and that their restricted developmental horizons were due to their inability to come to terms with their trauma experience. Newman has demonstrated similar emotional impairment amongst the children who survived the Buffalo Creek disaster which included an increased sense of vulnerability to future stresses and an altered sense of power of the self. Again the clinical relevance of this data is difficult to ascertain. No systematic research has been conducted attempting to define caseness using a standard measure although Bloch et al attempted to categorise the severity of the emotional reaction in a group of children exposed to a tornado. These workers also attempted to elicit what were the disaster related events that had the greatest impact on the children. Their research suggest that the children's reactions must be understood within the context of their family and that in the early phases of disaster their reactions are a function of the way in which reality filters down to them and so mirrors their parents' reactions rather than relating directly to the event. The general conclusion is that children rarely need specialist psychiatric treatment but they do benefit from an opportunity to ventilate their anxieties to a sympathetic adult (Kinston & Rosser). Teachers are another group that are likely to have an important impact on a child's sense of safety and the longer term acceptance of a disaster although this has not been investigated. In summary, research has indicated those most at risk are between the ages of 8 and 12, have a previous history of physical emotional illness and come from unstable homes.

Based on this knowledge it seemed that any future research should incorporate a longitudinal design that included some measure of parental adaptation. Similarly, the instrument used for measuring psychiatric disorder in children should be well validated and be able to define likely psychiatric cases. The need to examine a large population so as to make some assessment of risk and prevalence also seemed important priorities.

AIMS

The aims of the study were:-

1. To describe and document psychological morbidity of children between the ages of 7 and 12 secondary to the Ash Wednesday bushfires.
2. To determine what aspects of the children's experience was particularly harmful and to examine the role that subsequent events played in the maintenance and mitigation of their distress.

In South Australia there were three main areas affected by the bushfires - the Adelaide hills, the Clare Valley district and the south east of the State. The primary schools in the south east were chosen for study for several reasons. Firstly, the population affected by the fire was easily defined geographically unlike the Adelaide hills population, where many children attend school in the city. Secondly, the Child, Adolescent and Family Health Services had recently established a psychiatric service for children in the south east of the State and had established contact with the schools in the first days after the fire. They had provided information about the expected reactions of children and the availability of clinical services if they were required. Ms Sandy Policansky and Dr Claire Irwin the Director of the Service assisted in setting up the research project. It was reasonable to speculate that the impact of these fires on the south eastern community was substantial. The intensity of the fire was extreme, flames 800 feet high having been photographed. At some points of the fire the wind was strong enough to snap mature pine trees half way up their trunks. Fourteen people died in the fire and 40 homes were destroyed. 359 properties were partially or fully burnt and 120,000 hectares of agricultural, pastoral and forest land were laid waste. The extent of the devastation by the fire in this region was in fact greater than in the Adelaide hills.

Seven primary schools were chosen for study. One declined to be involved. One school, Penola lay outside the fire affected area, although a number of the children attending the school came from the area that had been burnt out. The staff at this school were reluctant to participate and had to be paid to fill in the first stage questionnaires. Thus the co-operation of the schools of the periphery of the fire was less than those in the fire affected areas. Although this research was conducted under the auspices of a clinical service, in the initial stages the general impression was given that there were few or no problems that required investigation. The following hypotheses were to be examined.

1. The prevalence of cases would be:
 - a. Greater than the comparable rural population.
 - b. Decrease with time after the disaster.
 - c. Proportional to the exposure and losses experienced by the child and his/her family.
2. Parental or family distress and other factors which may change and disrupt the parent child relationship would be associated with high levels of morbidity.
3. Psychiatric disorder would be an important source of absenteeism from school.
4. Teachers accurate perception of children's distress would be a protective factor.

METHODOLOGY

The population was studied two and eight months after the fire. Rutter's Parent and Teacher questionnaires were chosen as the dependent variables. The advantages were that two independent ratings would be obtained on each child and that the instrument could both be scored as a linear scale and a measure of caseness. Lack of resources meant that as has been the case in the majority of other studies using these instruments, it was not possible to interview those children scoring in the pathological range. As well as filling in the Rutter's scale, the parents were asked to document the personal and property losses of the family as well as the experience of the child and themselves on Ash Wednesday. Several questions were also asked about the immediate impact of the disaster on the family's functioning. The Parents' Questionnaire for the second stage of the study was designed to measure the continuing impact of the disaster on the families. This included the resolution of grief about the losses, whether the parents had recurring thoughts and feelings about the fire, and the extent of reconstruction. An eleven item scale was designed to measure family functioning, focusing on the types of disorder that could be anticipated in post traumatic syndromes.

A preliminary analysis of the data from the first stage of the study suggests several modifications were necessary to the methodology in the second stage. Firstly, the inverse correlation between age and the number of symptoms suggested that younger children should be included. The study was therefore extended to include preparatory students as well as grades 1 and 2. When analysing the individual teacher's responses in stage 1, a wide variation in the number of symptoms reported in their classes was noted. Some teachers had not reported a single symptom in 30 pupils. It seemed that attempting to identify some of the variables that influence teachers reporting behaviour would allow the development of some understanding into the denial of children's distress by adults in a disaster setting. The individual teachers were interviewed under the guise of collecting information about children in their classes who were high scorers on the parents' scale or parents had not responded on the first occasion. Some extra items were also added to the parent and teacher questionnaires for the second stage that covered behaviours reported by the teachers as being typical of a continued preoccupation of the fire.

The return rate obtained at stage 1 was much lower than in most studies that have used Rutter's instruments. For this reason I decided to attempt to recontact those parents who failed to respond in stage 1. This required developing a third questionnaire that represented a condensation of the stage 1 and stage 2 questionnaires. The same questionnaire was given to the parents of the younger children.

Finally the comparison between the stage 1 data and a control group of school children in rural Queensland (Connell) raised a number of questions about the adequacy of this control. For this reason a control group study has been set up in a neighbouring

district of the south east of South Australia. In June 1984 700 children in two Naracoorte primary schools are going to be surveyed using Rutter's instruments.

RESULTS

The total number of children examined in this study was 809. The original sample was 520. On that occasion a response rate of 45.2% was obtained from the parents. I depended upon teachers to ensure an adequate response rate and did not recircularise the parents. In the second stage of the study a parent response rate of 57.7% was obtained. In the interim I had sent the parents a copy of the preliminary results of stage 1 and then sent them three reminder letters to attempt to improve the return rate. On both occasions the teacher response rate was approximately 88%. Thus two groups existed for data analysis. The first included those children whose parents had responded at time 1 and the second group were the children whose parents did not respond at time 1 but did at time 2. Only the data from the teachers questionnaires will be presented. This represents the lowest denominator of disorder and suggests that the level of problems may be substantially underestimated because of the relative insensitivity of teachers to psychiatric symptoms in their pupils. On the other hand, it avoids the possibility of attribution by parents by the knowledge of the child's exposure and minimises the impact that their own mental state may have on their reporting of symptoms in children.

The age of the subjects included in the study ranged from 4 to 13 with the mean being 8.1 years and 52% of the subjects were males. The distribution across the eight primary grades was fairly equal. The mean number of children per family was 2.9 and only 5.7% came from single parent families.

Examining the exposure of the children on Ash Wednesday 43% of those children threatened by the fire were with their parents at the time the fire passed and 28.9% were on a school bus. The level of the personal threat experienced by their parents was substantial, 25.1% of the fathers coming close to injury. Approximately a quarter of the families were split up in the first three days after the disaster. 27.4% of the families had a friend or relative killed or injured seriously on Ash Wednesday and 31.9% had had some form of property loss. Thus on all accounts, the impact of the disaster on these children's families had been substantial.

Looking at the range of scores on the Teacher's scale only 2.7% of children scored in the range of a psychiatric case which compared with 10% in the rural population in Queensland. Thus the levels of morbidity were very much lower than predicted. There are a number of possible explanations for this observation.

1. It seems that in response to this major stress many children may in fact be better behaved and more compliant than usual. It seems that they are aware of the extent of the calamity and become more agreeable in this setting. Thus to a degree they internalised the experience.

2. It seems likely that the parent and teachers pre-occupations with their own losses and feelings in relation to the fire makes them less observant of their children. This notion is supported by the observations of Bloch in his interviews with parents in the early stages after a tornado.
3. There was a general reluctance within this community to acknowledge the fact that children may have experienced psychological pain as a result of the fires. They seemed to believe the myth that many children are too young to know what has really happened. Despite the considerable efforts put into establishing this research project, the relatively low return rate has to some degree been a measure of the denial about the psychological issues at a time when the practical tasks of reconstruction were immense.
4. It seems that a number of children had in fact somatised their reaction to the fire. Headaches were twice as prevalent in this community compared with controls. The relevance of this observation was highlighted by one teacher, who commented, on hearing the results of the study, that in his class of 17 children in the first six months of 1983 there were more absentees than in his entire class of 31 children in 1982. He commented that a large proportion of this indiscrete absence could be accounted for by headaches and stomach-aches.

Doing a correlational analysis, the following factors were associated with a raised score on the teacher scale. Age had a negative correlation so the younger children were more distressed. Interestingly there was no correlation with property loss. The child's personal exposure was important $p = .04$ as was if the family was split up in the first three days after the fire ($p = .013$). At this stage, personal loss by the family ($p = .009$) or if the parent came close to injury ($p = .005$) were strong predictors on the teachers scale of psychiatric morbidity. Thus in the early stages after the fire, the level of exposure to the fire by both the child and their parent rather than the losses experience were the strongest predictors of psychiatric morbidity.

Looking at the findings of the eight month follow up, the continuing impact of the disaster was substantial. 40% of families reported that much work was still to be done and over a third still reported that their income was significantly affected. Nearly 80% of the parents had been unable to put their losses behind them and frequently felt pre-occupied by them. A further enquiry into the parents feelings and thoughts about the fire indicated that 8.8% were less able to cope than before and around 74% were reporting intrusive thoughts and feelings about the fire. In general approximately 45% were feeling more over-protective of their children. Although some families reported feeling closer after the fire, a significant number had felt their family relationships had come under strain.

Looking at the level of pre-occupation reported by parents and teachers by the children about the fire, 43% of children spontaneously continued to talk about the event and 35% were upset by

reminders according to the parents. The teachers' reports about pre-occupation with the fire were very much lower. These results, for example that only 3.2% of children were afraid of fire sirens, would seem to represent a substantial underestimate. When I was visiting a school to interview the teachers a fire siren was accidentally triggered. The whole of one teachers class burst into tears despite the fact that it was pouring with rain and there was clearly little chance of there being another fire.

Looking at the teachers scale, 8% of children were now scoring in the range of a psychiatric case and the mean score had doubled from the original survey. However, the level remained 2% below that in the control population. At this stage it was possible to ascertain how the parents who had only responded on the second occasion compared with the responders at time 1. The levels of property and personal loss were no different and similarly the level of disruption caused within the families by the disaster was similar. However, those who responded only the second occasion reported worrying more about harm coming to their children and reported more changes in their family. This suggests that these people may have been more prone to deny the distress of their children originally because they were under greater emotional stress themselves.

Using between group comparisons, it was possible to examine the continuing impact of a disaster at time 1 on the teachers scale at eight months. Boys scored significantly higher than girls. Excluding intrusive thoughts which corresponded with all measures, the strongest predictor of disorder seemed to be whether the parents came close to the injury. Property loss was also found to be significant on the neurotic scale although personal loss was not a predictor from the total score. Children on school buses tended to score lower. These findings tend to suggest that the practical nature of the events that occurred on Ash Wednesday were continuing to have some effect eight months later but this was only likely to account for a small percentage of the variance of the children's score.

Looking at correlations with the teachers scale at eight months, there was a negative correlation with age which was statistically significant at the level of P less than .001. On the total score changes to the family functioning were significantly correlated P less than .05 and it also seemed that the more senior the child was in the family the worse its outcome (P less than .05). The neurotic scale of the teachers instrument demonstrated stronger correlations, focusing again a continuing effect of property loss and the position of the child in the family and the changes in family functioning. These variables were highly significant at the level of P less than .001 on the Impact of Events Scale. This suggests that it is very difficult for a child to master his or her fears about a fire and to adapt to the future if his parents remain stressed by it. This does not necessarily mean that the 74 child will be symptomatic.

This data tends to support the relevance of focusing on the likely style, rather than simply focusing on symptomatic distress. On a simple correlation analysis it was found that the neurotic score on the teachers scale was a predictor of the number of days absent.

Examining the question of the number of days absent from school in more detail, 20% of children had missed more school in 1983. Comparing these children with other pupils on the Parent and Teacher Scale the difference is a statistically significant level of P is less than .000. This suggests that psychiatric morbidity is an important source of absenteeism in primary school children. As results have indicated, psychiatric morbidity has a significant but not overwhelming correlation with a number of disaster related experiences, suggesting that this is an important source of disruption to at least some children's developmental progression.

CONCLUSIONS

This study into the psychological impact of the Ash Wednesday fires on primary school children in South Australia indicates that there is a significant association between children's disaster related experiences and their psychological morbidity. These associations hold up even using the relatively insensitive measure of the Teachers Scale developed by Rutter. The following are also described:-

1. The levels of distress are greater at eight months than two months after the disaster. This is contrary to prediction and indicates that children's level of morbidity was rising at a time when the disaster related services are likely to be withdrawn.
2. The levels of morbidity are not statistically greater than in a controlled population and by no means represent an epidemic of disorder. This suggests that the significant majority of children survived the experience of a fire relatively free of symptoms. On the other hand the substantial presence of intrusive thoughts and feelings amongst these children, typical of post traumatic syndromes leaves many questions unanswered about the developmental impact of this experience on these children.
3. This study supports the finding from adult psychiatry that there is a link between adversity and symptoms but the association is not a powerful one. To explain psychiatric disorder, questions of individual vulnerability rather than environmental factors need to be explored. In this population of children, it seems that disturbed family functioning and parental distress following a disaster is the major vulnerability factor identified.

4. Psychiatric disorders in disaster affected populations often are missed because they presented physical symptoms. The high prevalence of headaches and stomach-aches was found at both stages of the study.
5. The levels of awareness amongst teachers at the time of disasters requires assessment as they may tend to isolate themselves from the experience of their pupils and parents.

Finally, because the prevalence of a major psychiatric disorder is relatively uncommon even after circumstances where the community has experienced extreme environmental stress, it is easy for these disorders to be ignored. The evidence would suggest that in at least some the psychological symptoms that are experienced are qualitatively and quantitatively different from the more ubiquitous non specific symptoms observed in disaster affected populations. Unless these two sorts of distress are separated, significant difficulties can be left untreated to the child's long term detriment. Personnel with specific mental health training are required to treat such a disorder.

The number of children requiring such treatment after a major disaster is likely to be numerically very small. On the other hand, it seems that many of these difficulties could be circumvented by attending to the psychological welfare of their parents. The evidence would suggest that a number of post traumatic disorders in disaster affected adults go unmissed despite their presentation general practitioners and welfare services. Programmes to improve the rate of diagnosis and to ensure the provision of early treatment would likely to be one of the most effective ways of minimising the effect of a disaster on children who have been exposed to the event.

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