

TROPICAL CYCLONE OSCAR (1983)

PSYCHOLOGICAL REACTIONS OF A FIJIAN POPULATION

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INTRODUCTION

On the basis of interview and questionnaire data, 75 rural Fijians who survived Cyclone Oscar and 64 control subjects from a nearby unaffected urban area were compared on the following measures: pre-hurricane adjustment, hurricane experience, post-hurricane adjustment, physical symptoms, and psychological functioning.

Psychosocial response to disaster has been well described by many authors (see review by Kinston and Rosser, 1974). Specific research on cyclones has also been extensive (e.g. Crashaw, 1963; Parker, 1979, Patrick, 1981). Cyclone Oscar, described here, differed in several respects from those previously investigated. The scale of the disaster was modest, for instance there was no loss of life in the village studied. The population was not homogeneous containing two races and three religious groups. Finally there had been virtually no past contact with psychological or psychiatric services.

Many previous reports were descriptive and concentrated on behaviour during the Impact or Recoil Phases (Tyhurst, 1951). This study looked at the aftermath, using objective instruments as well as clinical assessment. In addition a control group was employed.

The aim of this study was to examine psychological morbidity during the months after the cyclone. How prevalent was disturbance and did this change with time? What forms did it take? What factors were associated with good or bad outcome?

The cyclone, named Oscar, struck the coast of Viti Levu, the main island of the Fiji Islands on the night of 1st March 1983. The cyclone had maximum sustained winds of 100 knots with gusts of up to 140 knots near its centre. Oscar has been classed as the worst natural disaster in Fiji since the cyclone of 1931. Nine lives were lost and preliminary damage estimates were about \$Aust. 85 Million (about 6 percent of Fiji's Gross Domestic Product).

The weather reports had been mentioning Cyclone Oscar for a week before its arrival. Initially it was moving westwards, away from Fiji. However by 28th February it had turned to a southeasterly direction and cyclone warnings were issued frequently until Oscar's arrival.

At Nabila, the community investigated here, the eye of the cyclone passed approximately 15 km out to sea, resulting in the settlement receiving the full brunt of the cyclone. The winds started blowing about 2pm and by 6pm were hurricane force. At 7pm there was a sudden rise in the level of sea (due to large waves, low atmospheric pressure and high tide) which caused flooding of coastal and low lying areas. For half an hour at 8.00pm the wind quietened but did not stop. People moved about checking damage or tried to reach a safer place. Then the wind returned from another direction, with even greater ferocity. By 2.00am the wind had dropped to storm force.

The relatively long duration of the hurricane winds (7 hours) due to the slow movement of the cyclone, enhanced the damage and the fear it caused. The experience was made even more frightening by the lack of visibility, due to the sheets of water accompanying the wind and the blackness of the night. The unexpected flood, the disintegrating houses, and physical impossibility of moving against the wind, compounded the terrifying experience. The wind's assault on his house was compared by one villager to a claw hammer trying to get out a difficult nail. When it couldn't get it from one direction it swung around to another. No one was killed in the settlement but one person was crushed badly and many received cuts. Every house was damaged, 90 percent lost their roofs more than half were completely destroyed.

METHOD

The cyclone affected area studied, was the settlement of Nabila, on the western coast of Viti Levu 30 kilometres by road from Nadi, the nearest town. Nabila consisted of about 25 modest dwellings each on a small pocket of land from 2 - 25 acres all of which are leased. Most of the farmers were Fijian Indians, descendants of indentured labourers brought in a century ago. Amenities included a shop and primary school.

The control group, was selected from an area of urban Lautoka, the second largest city of Fiji. The dwellings in this area were also modest mostly government low cost housing.

In Nabila every house was visited and in Lautoka approximately every fourth house was chosen. If an occupant was temporarily absent, a return visit was made. In this way most inhabitants over the age of 16 years were included in the sample. In the entire survey only one of the 140 subjects approached declined to take part. This was an elderly lady who, her family explained, had been very depressed and withdrawn since the cyclone.

The average time for collection of data following the cyclone was 10 weeks, ranging from 8 to 12 weeks post cyclone.

The instruments used were:

1. The General Health Questionnaire (GHQ)
2. A Physical Symptom Inventory
3. A questionnaire comprising: a) demographic data; b) adjustment prior to the hurricane; c) experience during the hurricane; d) adjustment after the hurricane.
4. Interviewer's assessment of;
a) social class; b) presence of current clinical psychiatric illness; c) social role of the individual (whether or not a community leader).

The GHQ has been widely used as a screening instrument, for psychiatric morbidity in community samples. It has been validated for such diverse populations as India, Spain and Jamaica (Goldberg, 1978). The GHQ was also administered to the evacuees from Cyclone Tracy (Parker, 1977). When used as a screening instrument the GHQ can assign each respondent into either a probably healthy or a 'probable psychiatric case' category. For this study a threshold GHQ score was adopted so as to produce a morbidity rate of 15 percent in the control group since this figure is the average level of psychological morbidity seen in most community surveys. The GHQ 28 was selected as the main instrument to assess psychiatric morbidity since it could also give information on symptom profile (Goldberg, 1978)

The Physical Symptom Inventory consisted of a list of 20 common physical symptoms including those reported as occurring in disaster victims (Leopold and Dillon, 1963). The questions were asked in the following form; 'have you recently been suffering from (the symptom)?' 'If so, is this symptom new to you?'

This approach thus provided three scores: a) Total Current Symptoms, b) New Symptoms and, by subtraction, c) Pre-existing or baseline Symptoms.

Fourteen individuals with past psychiatric history, high GHQ scores and high proficiency in English were given more detailed psychiatric assessments and an attempt was made to arrive at a clinical diagnosis.

DATA ANALYSIS

Statistics employed were largely Chi square analyses of cross tabulated data; for instance Age was grouped into those below 25 years, 25 to 50 years and those over 50 years. In some instances Student t Tests or Pearson Correlation Coefficients were used where appropriate.

RESULTS

The Sample

The sample consisted of 75 cyclone victims and 64 urban controls of whom 51 percent and 47 percent respectively were males.

The two groups were comparable on demographic variables except that Fiji Indians comprised 89 percent of the cyclone group and 71 percent of the urban controls, reflecting the tendencies for farmers to be Indian. Ages ranged from 16 to 76 years, mean 34 years and was similar to the age distribution in the 1981 census. The Indians were either Muslim or Hindu while the Fijians were Christian. Two thirds were married. Separated and widowed people were rare. Twenty percent were rated as middle class. Eight percent were clearly leaders of the community or family groups.

Pre-cyclone adjustment of both groups was similar. The vast majority living with first degree relatives, 57 percent were employed or full time students, 9 percent had received previous medical treatment for 'nerves', 47 percent of the affected group and 41 percent of the controls were under regular medical treatment or had seen a doctor in the month preceding the cyclone. The mean number of pre-existing physical symptoms was 2.7 and 2.8 respectively.

Of the cyclone affected group 75 percent thought they would be killed; 40 percent fled their homes; 19 percent were injured; 40 percent suffered severe property losses and 37 percent moderate losses; 13 percent ceased work or full time studies.

OUTCOME MEASURES

a) General Health Questionnaire

A case rate of 33 percent was obtained for the cyclone affected group compared with 15 percent for the controls.

On the symptom subscales the affected group had significantly higher scores for anxiety and somatic concern but not for depression.

b) Physical Symptoms

The affected group had more current symptoms, (mean 6.1) than the controls (mean 4.7). Forty three percent and 25 percent respectively had three or more new physical symptoms. Both these differences were significant at the 0.05 level. The most frequently complained of new symptoms were loss of appetite, headache, exhaustion, dizziness and chest pain.

GHQ scores and the number of new symptoms were highly correlated ($r = 0.38$, $p < 0.01$). Of those cyclone victims assessed as probable psychiatric cases 78 percent had 3 or more new physical symptoms. Twenty five percent of the cyclone affected group had both psychiatric disturbance and multiple new physical symptoms.

c) Post Disaster Adjustment of Cyclone Victims

Sixty six percent were troubled by persistent fears. These were mostly of a recurrence of the cyclone but also of drowning, infectious disease or fires. Acute upsurges of fear were precipitated by gusty winds or an overcast sky.

Forty seven percent felt their health had deteriorated and 49 percent had sought medical treatment.

The proportion in paid employment or full time students had dropped from 57 percent to 44 percent.

On a more optimistic note 64 percent felt that they were coping well with the crisis. A further 64 percent felt that in time life would be as good as it was before.

d) Resolution of Symptoms With Time

The cyclone affected group was divided into the 37 subjects seen in the eighth and ninth week after the cyclone and the 38 seen in the twelfth week. The two groups were comparable

on demographic variables and degree of cyclone stress except for an excess of middle class individuals in the first assessed group.

(Examination of the relationship between social class and outcome measures however revealed no significant associations).

i) Psychiatric morbidity: using the GHQ 45 percent of those assessed at two months were probable 'psychiatric cases' compared to 19 percent of those seen at three months.

ii) Physical symptoms: Forty seven percent of the first group had 3 or more new physical symptoms compared with 29 percent of the later group. Gastrointestinal symptoms such as nausea and loss of appetite were prominent new symptoms in the first group but had largely disappeared by three months.

iii) Post disaster adjustment: two thirds of both groups still suffered recurrent fears. On other items such as health, employment, accommodation and view of the future there was a trend for the later group to report fewer difficulties.

e) Predictors of Outcome

When each demographic pre-cyclone adjustment and cyclone experience variable was examined in relation to the outcome measures few significant associations were found.

The elderly were more likely to suffer 3 or more new physical symptoms ($\text{Chi}^2 = 6.1$ with 2 degrees of freedom, $p < 0.05$). There also was a trend for those over 50 to be more often assessed as 'probable psychiatric cases'.

There was a highly significant association between severity of property loss and GHQ assessment of psychiatric morbidity ($\text{Chi}^2 = 13.99$ with 2DF, $p < 0.01$). Those with heavy losses also tended to have more physical symptoms and poorer social adjustment. Those who thought they were going to die during the cyclone were more likely to develop subsequent persisting fears.

"Good overall outcome" was defined as having two or less new physical symptoms and assessment as 'probably not a case' by the GHQ. Fifty percent of the villagers met these criteria however none of the variables examined were associated with 'good outcome'.

f) Clinical Psychiatric Diagnosis

Of the fourteen who were assessed in more detail a DSM III diagnosis was arrived at in thirteen cases. It should be remembered that this was not a random sample but selected on the high probability of psychiatric disturbance.

Six met the DSM III criteria for the Acute Post Traumatic Stress Disorder. Three cases had major depression, two indeed had melancholia. One known case of bipolar affective disorder suffered a depressive episode precipitated by the cyclone.

Three cases were found in which there was a mixture of anxiety and depressive symptomatology, i.e. Atypical Depression. A supplementary primary diagnosis of Alcohol Abuse and Drug Abuse was made in two to the above cases. (The drug abused was Yagona, a locally crushed root containing small amounts of opiate-like alkaloids).

DISCUSSION

Psychological Morbidity

Ten weeks after the cyclone, the proportion of 'psychiatric cases' in the survivors was more than double that in the controls. Since the experimental and control groups differed significantly in race and religion, it is important to note that these variables did not account for the group differences in GHQ score since they were not associated with either the GHQ or the new physical symptoms index. Thus the racial differences did not account for the excess morbidity in the cyclone group. A rate double that of controls, was also found by Parker (1977) using the GHQ on evacuees after Cyclone Tracy.

Anxiety, rather than depression accounted for most of this psychiatric disturbance. This was manifested as muscular tension, apprehension, restlessness, fears, inability to concentrate, unwanted memories of the cyclone intruding into consciousness and double checking. Some of these symptoms were found in almost all cyclone victims. The preponderance of anxiety over depressive symptoms was also noted in cyclone victims by Parker (1977) and Patrick (1981) and in marine fire survivors by Leopold and Dillon (1963).

Although depressive symptoms were less common, those most frequently mentioned were 'worrying too much', 'sadness' most of the time, 'lack of energy' or 'irritability'. Very few admitted to being suicidal or wishing they were dead. These questions usually caused embarrassed giggling and denial, even in subjects who had just admitted to feeling totally hopeless. By contrast Patrick (1981) found 41 percent of his Sri Lankan sample were 'suicidal'. This may reflect religious differences as his sample were Hindus who do not regard suicide with as much opprobrium as Christians or Muslims. Despite its relative rarity the most disabled individuals seen were those suffering from severe depression. As there was no mortality, the depressed individuals usually related their mood to lost possessions. In most cases these material losses were extensive but occasionally they were small treasured items such as a photo collection.

Physical Morbidity

In this study subjects were questioned on their level of physical symptoms. There was no attempt to measure the prevalence of physical illness or relate it to utilisation of medical services.

Changes in these two aspects of health have however already been clearly related to stress. Wyler, et al (1971) found a relation between the magnitude of life change scores and the actual severity of subsequent disease. While after both the Bristol floods (Bennet, 1970) and Brisbane floods (Abrahams, 1976) there was a marked increase in the utilisation of all medical services.

In this study the proportion of victims with multiple new physical symptoms was nearly twice that found in the control population. Thus the rise in psychiatric symptoms was paralleled by that of physical symptoms. It is interesting to note that there were not two separate groups of reactors to the cyclone i.e. 'somatizers' or 'neurotics'. In a large proportion of cases it was the same individuals who bore the brunt of the physical and psychiatric distress. This overlap between physical and psychiatric illness has been noted in many studies (Andrews, 1978).

Rapid Resolution

By three months after the cyclone both the psychiatric morbidity, (as judged by the GHQ), and level of physical symptoms, had almost reverted to that found in a non-affected control population. This is despite an ongoing crisis in the form of water shortages and crop losses. It appeared that the acute, life threatening stress of the cyclone left in its wake a high level of psychological disturbance; 45 percent of the population ill enough to be regarded as requiring psychiatric treatment at two months. This early peak was followed by a rapid return to near normal levels of symptoms. In the study most closely comparable to this one, Parker (1977) investigating Cyclone Tracy evacuees using the GHQ found 58 percent morbidity initially, falling to 41 percent at ten weeks and 22 percent, the control level, at fourteen months.

While the survey was being conducted a difference between those interviewed early and later was apparent. The first group had a pressure to talk about the cyclone, they would go over and over the events of that night. This was much less apparent in the second group. This urgency to ventilate and not letting go was reminiscent of Tyhurst's (1951) description of behaviour during the 'recoil' phase, shortly after a disaster.

Outcome Predictors

When we examined the potential 'predictors' of morbidity there was a surprising dearth of significant relationships. This may indicate that the degree of distress was fairly uniformly experienced by all groupings in the settlement. The major finding was the strong association between the severity of property loss and subsequent psychiatric morbidity.

In another cyclone study a similar trend was found by Parker (1977). After the Bristol floods Bennet (1970) found an association between property loss and medical attendances but not with psychiatric symptoms. Several authors for example (Crashaw 1963 and Edwards 1976) observed that it was the elderly who were most distressed by the destruction of their homes and possessions. Possibly this was due to the loss of symbolic assets as well as the realistic assessment that they were less likely than the young, to be able to successfully rebuild in their lifetime.

It was also found that increasing age, particularly over 50 years, was associated with a greater likelihood of multiple physical symptoms. This was not just a function of age, as in the non-cyclone affected control group there was no significant relationship between aging and new symptoms. The elderly also tended to be more often assessed as psychiatrically ill by the GHQ. This trend was not apparent in the control group beside which the age of the population has no clear effect on the GHQ (Goldberg, 1978). This age relation has been noted in most other disasters studied (Price, 1978; Leopold and Dillon, 1963 and Bennet, 1970).

The association between fear of death or serious injury during the cyclone and the development of subsequent fears of strong winds is also hardly surprising. This fear, in some cases terror, occurring during a disaster has been called 'mortality stressor' by Parker (1977) and was associated with psychiatric morbidity shortly after the cyclone. At 10 weeks he found, as was the case in this study, that there was a trend for it to be associated with the GHQ score.

With so many variables examined in relation to outcome the possibility of associations arising through Type II error must be considered. However these three positive findings are well supported by previous research. Some of the negative findings were in contrast to those usually reported. Many disaster studies show women to be more vulnerable (Abrahams, 1976; Bennet, 1970 and Parker, 1977); this is not the case in this study. While minor psychiatric morbidity is more common in women in Western countries it is not always found in third world countries (Oxley and Wing). Edwards (1976) and Kinston and Rosser (1974) noted the effect of disasters on the mentally ill and commented that they were predisposed to develop more psychiatric disturbance.

No effect was found in this study, possibly reflecting the relatively minor nature of most of the previous psychiatric complaints. It was postulated that being the head of a family and in a position to make decisions and to some extent determine the pattern of reconstruction might be a healthy coping style. The numbers were small but even so no trend emerged. Race and religion had no effect, even though the Indians tended to have more material possessions and thus greater property losses.

Aspects of the cyclone, such as staying put or being hurt were not significant predictors of outcome.

"Good overall outcome" which was assessed in this study as low GHQ score and few new symptoms, had no significant associations. The most important protective and reparative factor in a disaster appears to be the support offered to the individual by his social network (Boman 1979). While this was very much in evidence in Nabila it was not able to be measured by the somewhat insensitive variables used in this study.

CONCLUSION

This study provides information on the natural history of human response to disasters. In this case compensation issues or psychological intervention did not influence the outcome. This data should be of value to health service planners charged with providing medical services after a modest natural disaster.

The main findings, in summary, were that in the weeks after a cyclone a significant proportion of the population was suffering from neurotic and physical symptoms. No group escaped but the elderly and those who lost the most fared the worst. Race made no difference and these results were comparable to those found in studies of Caucasians. For most, the disturbance was transient and by three months morbidity levels had almost returned to control levels. A small number of individuals however remained severely disturbed and would probably require treatment.

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