SOCIAL SUPPORT AND ADJUSTMENT FOLLOWING DISASTER

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A growing body of research indicates that well developed social support networks may have a generally beneficial effect and provide a protective influence for individuals in times of stress whether these are normal life stressors or more devastating events such as disaster (Barton, 1970; Caplan, 1974; Cobb, 1976; Dean & Lin, 1977). For example, many of those who experienced the Granville rail disaster and who developed chronic symptoms lacked an effective family support system (Boman, 1979). Similarly, twelve months after the Three Mile Island incident, a significant inverse relationship was evident between perceived support and psychological symptoms (Fleming, Baum, Gisriel & Gatchel, 1982). Barton (1970) has referred to the emergence and development of supportive behaviour following disaster as the "therapeutic community" and suggests that this "helps to compensate for the sorrow and stress...with an unexpected abundance of personal warmth and direct help" (p.207).

However, despite the generally recognised benefits little is known regarding the effective or essential components of social support. For instance, Cobb (1976) suggests that the essential ingredients are caring, warmth and membership of a network of mutual obligation whereas Caplan (1981) proposes that support primarily provides cognitive guidance and feedback which facilitate mastery of stressful circumstances or reactions. Additionally, social support can be viewed in terms of its structure, content and the process by which the first two are utilised (Leavey, 1983). In the case of a disaster, the structure may consist of already existing networks of family, friends and neighbours and will be increased to encompass other affected individuals and the special resources made available such as health and welfare services, professional advisors and so on. This increased structure constitutes Barton's "therapeutic community" (1970). One post disaster study found that following a tornado, younger individuals made greater use of official agencies than did older age groups, and that they also experienced more psychological and physical impairment (Bell, Kara & Batterson, 1978).

In contrast to an emphasis on one central component of social support, Schaefer and colleagues (Schaeffer, Coyne & Lazarus, 1981) suggest that emotional (empathy, attention), tangible (practical assistance) and informational (information regarding the disaster, its consequences and sources of assistance) aspects may all be important. The suggestion that these function separately in their relation to psychological symptoms and stressful life events has been supported by the finding that low tangible support and emotional support, in conjunction with certain life events, were independently related to depression and negative morale while informational support was associated with positive morale (Schaeffer et al., 1981).

The process of using social support will be impeded or facilitated by the personality and other characteristics of the individual (Leavy, 1983). Locus of control (Rotter, 1966) constitutes one such characteristic and research has indicated that individuals with an external locus of control (that is, those who perceive that events in their life are controlled by external forces such as God, fate, the government) generally fare worse and have more symptoms than do individuals with an internal locus of control (those who perceive that they control events within their lives and environment), (Kobasa, 1979; Kobasa, Hilker & Maddi, 1979). While Rotter (1975) suggests that this may in part be due to internals' tendency to repress failures and unpleasant experiences, it may also be related to the groups differential utilisation of social support networks. For instance, Sandler & Lakey (1982) report that externals tend to have larger social support networks than do internals but the latter derive greater benefit from their relatively smaller networks.

At this point there has not been sufficient research to permit the elucidation of the essential components and parameters of social support and this is particularly the case in the area of disaster research. Although high levels of social support have been indicated as beneficial following disaster, little attention has been focused on which individuals may be at greatest risk in relation to social support available, and what types of support, provided by different sources, is particularly beneficial.

In this paper a preliminary analysis is made of some of these questions. The study was designed to assess the psychological and physical status of women four months after they had lost their homes in one of two bushfires which devastated the Macedon and Mt. Macedon communities in February, 1983. The relative contributions of age, locus of control and different types of social support as related to particular health outcomes were assessed, as was the question of whether locus of control affected the utilisation of different types of support.

METHOD

Subjects

Questionnaires and interviews were completed by thirty-eight female residents of the Mt.Macedon and Macedon townships ranging in ages between 21 and 70,mean age 39.7 years whose homes were destroyed in the bushfires during February, 1983. The women were undertaking home duties or were working locally. Contact occurred at drop-in centres established after the Ash Wednesday fire (N=12) or in their own homes following word of mouth or other contact (N=26). Although no relevant data were collected the sample included members from a wide range of socioeconomic groupings reflecting the general mix of the Macedon and Mt. Macedon populations.

Measures

(i) General Health Questionnaire

The General Health Questionnaire (GHQ) was used to assess non-psychotic impairment and neurotic symptoms (Goldberg, 1972). The GHQ has been validated and used extensively in Australia (Tennant, 1977). In this study the 30 item version was utilised and the cut-off score of 4/5 used to classify non-cases and cases.

(ii) Physical Health

A questionnaire comprising 17 questions concerned with physical problems and symptoms such as headaches, backache, diarrhea and chest pains in terms of frequency during the previous two months was used to determine physical health status. A similar questionnaire has been previously used in a study of factory workers in Melbourne (Romas, 1982). Higher scores indicate higher levels of physical impairment.

(iii) Locus of Control

Rotter's Locus of Control (LOC) Scale (1966) was used to determine an internality-externality score for each individual.

(iv) Social Support

The content and structure of social support were investigated in the following manner:

Content: A modified version of the Inventory of Socially Supportive Behaviours (ISSB) developed by Barrera, Sandler and Ramsay (1981) was used to obtain the frequency with which the women were the recipients of socially supportive behaviours during the past month. The ISSB was modified by deleting

four items from the test to provide 12 instances of emotional (EMO), tangible (TAN) and informational (INF) support as classified by Schaeffer and colleagues (1981). The ISSB is characterised by questions which are behaviour specific and lack overlap with physical or psychological adjustment.

Structure: For each item, the subject was asked to indicate the provider of the support according to one of eight categories: Husband or partner; family member; friend; neighbour; member of a group such as Red Cross, Church, Lions; member of a self-help group; a health professional; an adviser such as bank manager, solicitor, council officer.

Procedure

In June and July 1983 approximately four months after the bushfires the women were interviewed briefly, the purpose of the study explained and they completed the questionnaires described above. All subjects were assured of confidentiality. The average completion time of the questionnaire was one hour.

Design and Analysis

A step-wise multiple regression program (Nie, Hull, Jenkins, Streinbrenner and Bent, 1975) was used enabling a sequence of predictor variables to be ordered with respect to their independent contribution to the variance of the criterion measures (Overall and Klett, 1972). As will be described the criterion measures utilised in separate analyses were based on principal component subscales obtained from the GHQ and the PH questionnaire. The independent variables in each analysis were age, LOC, EMO, TAN and INF.

The unreliability of regression weights can present difficulties when using multiple regression analysis. It should be noted that with the sample size of approximately 40 in this study, the standard error of beta weights could be as high as .25 (Kerlinger and Pedhazur, 1973: p.442). While practical considerations placed restrictions on the present sample size, the number of subjects in relation to the number of independent variables (approximately 8:1) is larger than the 3:1 ratio considered useful in producing replicable results (Adams, 1978).

Principal conponents analysis were used to transform the given set of variables in the GHQ and the PH questionnaire to a set of composite variables or principal components which are orthogonal to each other (Nie et al., 1975). A varimax rotation was also incorporated to transform a given set of variables into a smaller set of principal components without making assumptions about the underlying structure of the original variables (Child, 1976).

The step-wise multiple regression procedure involved a separate analysis for each obtained principal component as the criterion measure. These separate analyses were performed because there was no a priori rationale for preferring to examine particular health outcomes over others. Rather than the normal GHQ scoring system a likert scoring method was employed for this measure for use in the principal components analysis. Reliability analyses were also performed to determine the consistency of each item in each principal component (Anastasi, 1976).

Separate t-tests were used to determine whether there were any significant differences in the receipt of emotional, tangible and informational support for internal scores below, and external scores above the median on the Rotter LOC scale.

RESULTS

Means and standard deviations for each of the measures are shown in Table 1.

TABLE 1

TOTAL SCORES OBTAINED FROM 38 BURNT OUT WOMEN

VARIABLE	MEAN	S.D.
GHQ scores	11.3	7.3
PH scores	39.9	13.1
Locus of Control	12.0	3.4
Emotional support (frequency)	2.5	0.7
Tangible support (frequency)	1.9	0.4
Information support (frequency)	1.9	0.6

The mean GHQ score is considerably higher than that of 5.5 obtained from a community sample of women in Perth (Burvill & Knuiman, 1983.) Physical Health scores are not different from those obtained for either employed or unemployed males and females in Melbourne (Cook & Kinsella, personal communication, 1983.)

Locus of control scores for this group are very similar to the mean of 12.14 obtained for Australian female university students (Gorman, Jones & Holman, 1980).

Informational and tangible support were received twice on average in the preceding month whereas emotional support was reported as occurring more often.

Using the recommended cut-off score of between 4 and 5 (Goldberg, 1972) for the identification of non-cases and cases, 29 of the 38 women can be classified as showing non-psychotic psychological impairment. Of these 29 cases, 25 showed very high scores (greater than 8).

Principal Components Analysis

Eight principal components with eigen values greater than 1.0 (Child, 1976) were identified from the GHQ and together they accounted for 79.1% of the variance in the data. Only the first four principal components which accounted for 61.5% of the variance were used in further analysis. Factor loadings of greater than .4 were chosen as recommended by Child (1976) for the present sample size. The other four components were discarded because of very low factor loadings, difficulty in interpretation or reliabiliy coefficients of less than 0.8.

For the Physical Health questionnaire, five principal components were identified but after criteria similar to those described above were applied, two principal components accounting for 42.9% of variance were utilised.

Stepwise Multiple Regression Analysis

Table 2 presents the four principal components for the GHQ together with the significantly loading variables identified in each of four separate stepwise multiple regressions and significance levels.

TABLE 2

GHQ PRINCIPAL COMPONENTS AND SIGNIFICANTLY LOADING VARIABLES

Principal component (% cumulative variance)	Significantly loading variables	Beta	R square Change	F	d.f
1. General depression & strain (36.1)	AGE	-0.49	0.22	9.2	1,32
2. Nervous and despairing (47.1)	AGE	-0.44	0.12	6.5	1,34
3. Mentally unalert	EMO	0.33	0.19	4.9	1,34
(54.6)	AGE	-0.34	0.05	4.6	2,33
4. Lack of self confidence (61.5)	AGE	-0.53	0.17	10.3	1,32

For each principal component an inverse relationship with age was found and for the mentally unalert component there was a positive relationship with the level of emotional support.

The two principal components for the PH questionnaire, together with significantly loading variables identified in each of the two separate stepwise multiple regression analyses and significance levels are shown in Table 3

TABLE 3

PHYSICAL HEALTH PRINCIPAL COMPONENTS AND SIGNIFICANTLY LOADING VARIABLES

Principal component (% cumulative variance)	Significantly loading variables	Beta	R square Change	F	d.f.
1. Gastric and internal disturbance (29.3)	LOC	0.37	0.15	6.4	1,35
	INF	0.32	0.10	4.8	2,34
2. Fatigue, aches and pains (42.9)	AGE	-0.38	0.20	6.5	1,35

Positive relationships between locus of control and informational support were identified for the first principal component (gastric and internal disturbance) whereas an inverse relationship occurred between age and the second component: (fatigue, aches and pains).

Relationship between support providers and emotional, tangible and informational support.

In Table 4 the number of times people provided emotional, tangible and informational support is shown according to the ISSB. The numbers given do not necessarily represent separate individuals.

TABLE 4

TOTAL NUMBER OF OCCASIONS WHEN CATEGORY MEMBERS PROVIDED EMOTIONAL, TANGIBLE AND INFORMATION SUPPORT

ISSB STRUCTURE CATEGORY	EMO	TAN	INF
1. Husband, partner	142	39	53
2. Family members	303	175	147
3. Friend (s)	604	259	373
4. Neighbour(s)	36	16	17
5. Welfare/Service agencies	25	70	50
6. Self help groups	5	11	17
7. Health professional	21	4	35
8. Advisors	11	11	67

The largest number of support providers came from categories 2 and 3 (family members and friends). Husbands or partners provided primarily emotional support although this pattern was evident for each of the first four categories. Informational and tangible support rather than emotional help was provided by welfare and service agencies, such as Red Cross, church and Lions. Advisors (bank managers, local councillors, etc.) generally gave informational support whereas health professionals helped with informational and emotional support.

Locus of control and support content

To determine whether the frequency of receiving social support was related to internal or external locus of control, the scores on the Rotter I-E scale were split at the median score so that 19 below the median were grouped as externals. Three separate t tests (Mendenhall, McClave and Ramey, 1977) were employed to determine whether there were any significant differences between internals and externals in the mean frequency of emotional, tangible and informational support. No significant differences were found.

DISCUSSION

Levels of psychological and physical impairment and associated factors.

The finding of major elevations in GHQ scores in the group of women studied at four months following the bushfires lends support to the view that persistent adverse reactions occur following disaster (Tyhurst, 1951;Raphael, 1979). Twenty nine of the 38 women had scores indicating a high probability of a diagnosable non-psychotic psychiatric disorder. The two major features of this disorder are inability to carry out normal functions and the appearance of new reactions of a distressing nature. The mean score in this study (11.3) is considerably higher than that obtained from a general population sample of women in Perth (mean 5.5), (Burvill & Knuiman, 1983). Even the use of an extremely conservative cut off score of 8/9 would yield a ratio in this sample of 25:38 cases. At four months after the disaster there is certainly evidence of "adverse psychological reaction" rather than "minimal psychological reaction" (Hohaus, 1983) although the persistence of such adverse reaction in the longer term remains to be evaluated.

Abrahams and colleagues (Abrahams, Price, Whitlock and Williams,1976) also found increased psychological symptoms following the Brisbane floods, particularly for females. These authors suggested that remaining at home all day with reminders of losses may have contributed to this increased symptomatology. Similar factors may have been operative in the Macedon townships. Even though "Drop In" centres were established to provide a meeting place for the women living in caravans, only a relatively small group used such facilities. Some time was spent at the two "Drop In" centres in order to recruit subjects for this study, however over the four week period only 12 women were contacted. The majority of the subjects completed the test materials in temporary dwellings.

The Physical Health scores gave no evidence of increased physical symptomatology in this sample as compared to mixed sex samples of employed and unemployed Melbourne residents (Cook & Kinsella, personal communication). Although Tyhurst (1951) indicates that increased physical illness can be expected in the post impact phase, Abrahams et al. (1976) also found a preponderance of psychological as compared to physical symptoms, although a minor increase in headaches and gastric upsets were found 12 months after the Brisbane floods. Current models of psychosocial stressors and physical illness emphasise relatively long term processes involving various neuro-hormonal and immune systems (Selye, 1956; Henry & Stevens, 1977). In the light of this it is noteworthy that no evidence of increased physical symptomatology was found two months after a flood, whereas significantly more physical illness was evident three years after the event (Melick, 1978). In contrast, Gillis (1980) refers to minor physical complaints occurring during the turmoil-recoil phase (days to weeks) such as sleeplessness, diarrhoea and hypochondriachal aches and pains. It may be that physical reactions of an acute nature are prevalent soon after a disaster and more chronic reactions occur after a more substantial period. The current study may have been conducted at an hiatus between these acute and chronic reactions.

Although correlations between the variables are not reported here a significant correlation (r=.63) occurred between the GHQ and Physical Health scores. However the principal components analyses yielded apparently discrete components. The GHQ produced four components of sufficient value and reliability (general depression and strain; nervous and dispairing; mentally unalert; lack of self confidence) whereas the Physical Health Questionnaire yielded two (gastric and internal disturbances; fatigue, aches and pains) which are described in Tables 2 and 3.

For all the GHQ components, age was negatively correlated and this was also the case for the second Physical Health component. These positive relationships between increasing age and well being are consistent with the results of Bell, Kara and Batterson (1978) who reported more psychological and physical impairment amongst the younger age group following a tornado. They also reported that the elderly sample was atypical of the general elderly population in that they were more highly educated and had higher income and employment status. The group therefore had access to more physical and social resources after the tornado. Although no socioeconomic data were collected in the present study it may be that similar factors were operative in this sample.

Further speculations must include possible additional demands placed on younger women by virtue of dealing with families and young children whilst in temporary accommodation. Child behaviour disturbances such as increased anxiety and aggression are commonly reported following disasters (Burke, Borus, Burns, Millstein and Beasley, 1982) and it seems likely that these, together with associated lack of sleep, would contribute to mothers' feelings of despair, nervousness, lack of self confidence, depression, lack of alertness and fatigue. A further possibility is that the older women may have had greater experience in dealing with life stressors (and dealing with insurance companies, bureaucracies, house building, etc.) which would provide a form of "stress innoculation" (Meichenbaum, 1983). Once again it becomes crucial to assess longer term adjustment as the higher impairment of younger women may be reactive to their immediate situation and diminish as they move to more permanent accommodation and as child adjustment improves.

The major predictor of being mentally unalert was frequency of emotional support (Table 2). Those finding difficulties concentrating may be offered more emotional support and reassurance, or it may be that such women are particularly sensitive to, and value emotional support, and are therefore more likely to report instances.

The remaining component of Physical Health was gastric and internal disturbance (Table 3). This (and perhaps the other Physical Health component) is similar to the major type of physical disorder reported 12 months after the Brisbane floods (Abrahams et al., 1976). Externality was associated with increased gastric and internal disturbances. This finding is consistent with the suggestion that those who believe they have control over stressful events and their consequences will remain relatively healthy (Kobasa, 1979; Kobasa, Hilker & Maddi, 1979; Johnson & Sarason, 1979). Perceived lack of control can lead to increased subjective stress responses which can produce an effect on health via the immunological system and through neuroendocrinological response (Henry & Stevens, 1977). Gastric and internal illhealth may of themselves create a shift towards externality since such problems could continue to overwhelm the individual with feelings of being powerless to cope in their present situation. Alternatively, the relationship obtained may be due to the tendency of internals to repress their unpleasant symptoms thereby creating a spurious positive relationship between internality and good health (Rotter, 1975). Once again assessment of longer term adjustment may clarify these and other relationships.

As with locus of control, informational support significantly improved prediction of gastric and internal problems with informational support being positively related to the incidence of gastric problems. This relationship was most likely due to the receipt of information regarding the health disturbance and the provision of feedback concerning the associated problems.

Locus of Control and Disaster

The mean locus of control scores obtained for this sample support the view that it is inappropriate to apply the original Rotter I-E scale norms to the Australian population (Lange, 1980). The mean of the women's scores compared with the mean of 12.14 obtained for females enrolled in first year psychology at the Australian National University (Gorman, Jones & Holman, 1980) suggests that the scores obtained in this study do not support the finding (Smith, 1970) that individuals experiencing a crisis tend to score higher, and therefore become more external initially. This may be due to the time elapsed before data were collected in this study.

The loss of home and possessions constitutes a severe crisis where effective coping mechanisms (Pearlin & Schooler, 1978) are required to gain positive control over the current situation. While the difficulties of living in temporary accommodation were still present four months later, many of the women had already arranged for the rebuilding of their homes and some bushfire relief money had been received. It might be expected that perception of having greater control over the situation would be increased by this stage.

Providers of Social Support

Consistent with Drabek & Key's (1976) finding that relatives and friends were the most frequent sources of help for primary victims of a disaster, this study found the categories of people mentioned most were relatives and friends. Friends were mentioned more often than family members. Emotional support was largely received from spouse or partner, family and friends. It is a common attitude in those who have suffered to feel that they can share an experience only with someone when there is trust and a feeling of solidarity.

The "therapeutic community" proposed by Barton (1970) largely depends on the giving and receiving of emotional support, and this exchange was still evident four months after the disaster. The emotional support provided by spouse or partner, family and friends may be particularly beneficial in protecting health at this time - a view supported by Boman (1979) who reported a relationship between lack of an effective family support system and chronic health symptoms.

The fact that neighbours were mentioned fewer times than friends results from an unclear distinction between the two categories. The disaster recovery period appeared to distort the neighbour-friend dichotomy as it was explained to the respondents before completing the questionnaire. Either the respondents had a wider network of friends than neighbours before the fires or an increased network of friends was developed after the fire, and the status of neighbour became subsumed in the category of friend.

Relationship between support content, locus of control and recovery

No difference was found between internals and externals in the frequency that they reported receiving different types of support. Previous studies (reviewed in the introduction) have revealed relationships between locus of control and support network size and utilisation (Sandler & Lakey, 1982). This study attempted to extend these findings by examining possible relationships between support content and locus of control. The apparent inconsistency between the results of this study and the earlier reports may reflect a difference between quantity of support and support content, or factors specific to the timing of this study may have changed the relationships between social support and the other variables, including locus of control.

At the time these data were collected, it was apparent that the "therapeutic community" was still in operation, with large amounts of emotional and physical help still available. Given these circumstances it seems possible that relationships between social support and other variables might be "swamped" in these disaster affected individuals.

In a somewhat similar manner, the discrepancy between this and previous studies (Barton, 1970, Bell et al., 1978, Fleming et al., 1982) regarding the importance of social support may be related to the relatively short time elapsed and the apparent abundance of support available. Of the independent variables, age is by far the most important in predicting psychological, and to a lesser extent, physical problems.

The data reported here reflect the state of affairs four months post-disaster. Given the plentiful support available at this stage, it may take longer for substantial discrepancies in social support and the differential consequences, if any, to become apparent. A follow up study of social support and recovery in this population is planned.

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