

Social support deficits, loneliness and life events as risk factors for depression in old age. The Gospel Oak Project VI

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ABSTRACT

Background. A companion paper reported a very strong cross-sectional association between handicap and late-life depression. Adjusting for handicap weakened associations between socio-demographic variables and depression. It was unclear whether handicap was a confounder, or a useful summary variable, mediating the effect of a range of sociodemographic disadvantages. This paper focusses on the cross-sectional relationship between depression and demographic variables, social support, and life events.

Method. A community survey of all residents over the age of 65 years of an electoral district in London, UK.

Results. There was a moderate association between SHORT-CARE pervasive depression and the number of life events experienced over the previous year. Personal illness, bereavement and theft were the most salient events. There was a stronger, graded, relationship between the number of social support deficits (SSDs) and depression. Number of SSDs also related to age, handicap, loneliness and use of homecare services. Loneliness was itself strongly associated with depression; odds ratio 12.4 (7.6–20.0).

Conclusions. Problems of collinearity, and the cross-sectional design of the study limited interpretation of the exact nature of the relationship between social support, loneliness, handicap and depression. However, the clustering of these four factors can be used to define a large part of the elderly population with a poor quality of life. An important avenue for future research will be the development and implementation of population intervention strategies designed to address some or all of these problems among older people in general.

INTRODUCTION

The accompanying paper shows a strong cross-sectional association between handicap and depression in older age. Many established risk factors for depression such as female sex, living alone, lacking social support, not being currently married and having a low income were accounted for in whole or in part by handicap. However, handicap may summarize just those aspects of chronic life difficulty and social disadvantage which determine the consequences of a disease for an individual, and hence

predispose to depression in old age. Its use may be obscuring some of the fine detail in the association between sociodemographic indices and depression. The purpose of this paper is to describe the sociodemographic circumstances, the social networks and recent life experience of a representative sample of older inner city residents and to explore more fully their relationships with depression.

METHOD

Cross-sectional survey interviews were carried out between December 1993 and September 1994 on the enumerated population of Gospel Oak, aged 65 years and over. The definition of

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the catchment area, the establishment of the population register and the procedure for contacting and interviewing subjects are described in the accompanying paper. The dependent variable, as in the accompanying paper, was the category of 'pervasive depression', a fully validated broad index of depression of a severity likely to elicit a treatment intervention (Gurland *et al.* 1984). The independent variables relevant to this paper, are now described more fully.

Independent variables

(a) *Serious life events*

The List of Threatening Events (LTE) (Brugha *et al.* 1985; Brugha & Cragg, 1990) identified 12 events from a longer inventory, which, when validated against the Life Events and Difficulties Schedule (LEDS) (Brown & Harris, 1978), showed that 80% were rated as carrying significant long-term threat (Brugha & Cragg, 1990). The version used in this study covers nine serious events.

(b) *Social support*

Three conventional dimensions of support are the availability of support, the frequency of contact, and the satisfaction with support provided (Bowling, 1994). In this study these dimensions were measured as the numbers of supportive friends and neighbours, satisfaction with support from friends and neighbours, and frequency of support from relatives, friends and neighbours. Several items were derived from a study that had previously identified them as discriminating well between depressed and non-depressed subjects (James & Davies, 1987). We defined six social support deficits (SSDs) which, on the basis of earlier research, were likely to be highly salient to depression, and might be combined together into a summary scale. These were: (1) living alone; (2) seeing a relative less often than once a week; (3) having no supportive neighbours; (4) having one or less supportive friends; (5) experiencing upset or bother in a relationship with a child; and (6) experiencing dissatisfaction with support received from friends.

(c) *Income*

Subjects were divided into three income levels; state pension only, state pension plus less than

£100 per calendar month and state pension plus more than £100 per month.

(d) *Social class*

This was defined according to the United Kingdom Registrar General's classification.

(e) *Housing quality*

This was based on three quite distinct categories of housing in the study area: (1) private or privately rented, good quality houses, or houses divided into flats; (2) better quality local authority or housing association accommodation, predominately houses, but some small, well maintained blocks; and (3) poor quality, large, medium or high rise local authority housing blocks.

Analysis

Previous research allows us to identify some areas of special interest.

1 The life event instrument used in this study, the List of Threatening Events (LTE) (Brugha *et al.* 1985) was designed to detect events carrying significant long-term threat and may be more salient to depression than other checklists. We investigated whether severe life events identified by the LTE are more common in depressed than non-depressed older subjects.

2 Associations between life events and depression could be explained by an increased 'event proneness' among subjects experiencing long term disadvantage, which may independently increase their risk of depression. We investigated the relationship between experience of life events and chronic illness, low income, poor housing, limited education, and lower social class.

3 We defined six social support deficits (SSDs), which may act as vulnerability factors. We hypothesized that for subjects possessing any of these factors the risk of depression will be increased, but only in the presence of a life event, and that this effect would be especially prominent for subjects possessing several of these vulnerability characteristics.

4 An alternative hypothesis would be that the SSDs are direct risk factors for depression, exerting an effect independent of the stressor effect of life events.

5 We hypothesized that with reference to those

of their gender who have never married, married men will have a lower risk of depression and married women a higher risk of depression.

6 Spared from the burden of caring for young children, older married people may reap benefits from parenthood. We therefore hypothesized that childless married persons will be at greater risk of depression than married persons with children, regardless of gender.

7 We looked for a social class effect for depression, also for a relationship between social class and income, housing quality and social support deficits.

We present the prevalence of demographic factors, life events and social support deficits, and odds ratios for their association with the SHORT-CARE category of pervasive depression. In order to test for effect modification, odds ratios for the relationship between social support deficits and depression are stratified by experience of life events, and those for the relationship between marital status and depression are stratified by gender. Factors demonstrated in the univariate analysis to be associated with pervasive depression, were entered into a multivariate logistic regression using a forward stepwise technique, both to generate a parsimonious model, and to adjust for confounding where present.

RESULTS

The subjects

Response rates, and the general characteristics of the interviewed sample are given in the accompanying paper. Briefly, 654 out of a possible 889 subjects were interviewed.

Life events

In the year prior to interview, 50% of subjects had experienced no life events, 32% one life event and 18% two or more life events. Non-depressed subjects experienced fewer life events (mean 0.68, s.d. 0.9) than did depressed subjects (mean 0.92, s.d. 0.9); mean difference = 0.24 (95% confidence interval 0.07–0.42). The odds ratios for depression associated with one life event relative to the baseline of no events was 1.9 (1.2–3.0) and for two or more life events 2.0 (1.2–3.4); test for trend, $P = 0.003$. The 1- and 2-year prevalence of individual life events is given in Table 1, together with odd ratios for pervasive

depression, associated with the occurrence of the event in the year before interview. The increased risk of depression associated with the death of a child, parent or spouse was concentrated entirely among women. Twelve men had experienced such a bereavement in the 24 months before interview, of whom none were depressed. Of the 38 bereaved women, 14 were depressed. For women, the excess risk was confined to deaths which had occurred within 6 months of the interview. Six out of the seven women who had experienced such a recent loss were depressed; odds ratio 25.8 (3.1–1202), common odds test (test for interaction by gender), $P = 0.05$. The distribution of risk for depression differed between life events when subjects were stratified according to the time at which the event was experienced (Table 2). For the onset of an illness, and a close family bereavement, the excess risk was concentrated among those who had experienced the event in the 6 months prior to the interview. For theft, and financial crisis, the risk for depression was not dependent on the timing of the event. There was no relationship between the number of life events experienced over the previous year and age, gender, social class, income, housing quality, number of supportive friends or neighbours and frequency of contact with relatives.

Social support

Six social support deficits (SSDs) were identified *a priori*: 49% of the sample lived alone, 41% saw a relative less often than once a week, 29% could not identify any supportive neighbours, 56% had one or less supportive friends, 6% had experienced upset or bother in a relationship with a child and 9% were not satisfied with the support they received from their friends. Of the SSDs, living alone was associated with advanced age, female sex, and low income, but not with objective measures of social support such as number of friends or relatives available for support, frequency of contact with friends and club or church attendance. Having few friends was associated with lower social class, lower income, older age and not attending church or clubs. Married subjects and higher income groups had larger numbers of supportive neighbours. Frequency of contact with relatives was understandably lowest in the never married. Otherwise, and in contrast to the many associa-

Table 1. *One and two year period prevalence of individual life event categories, with odds ratios for pervasive depression associated with these exposures*

Event	1 year prevalence (%)	2 year prevalence (%)	Odds ratio for depression (for events in last year)
Serious illness (self)	18	26	2.1 (1.3-3.5)
Serious illness (close relative)	10	13	1.0 (0.5-2.1)
Bereavement (immediate family)	4	8	2.6 (1.0-6.3)
Bereavement (other relative or close friend)	25	36	0.8 (0.5-1.4)
Marital separation	0	0	—
End of relationship	2	3	2.1 (0.5-7.7)
Problem with close friend or relative	3	4	1.3 (0.3-4.0)
Financial crisis	2	3	1.9 (0.4-6.7)
Theft/loss	8	12	2.3 (1.2-4.5)

Table 2. *Odds ratios for pervasive depression associated with individual life events, stratified by time of onset of the event*

Event timing (months)	Illness (self)	Bereavement	Theft/loss	Financial crisis	End of relationship
0-6	2.4 (1.3-4.6)	5.9 (1.5-24.9)	2.5 (1.0-6.1)	4.9 (0.4-67.4)	0.8 (0.0-6.8)
7-12	1.8 (0.9-3.6)	1.2 (0.2-4.7)	2.4 (0.9-6.0)	1.2 (0.1-6.2)	4.9 (0.6-36.8)
13-24	1.0 (0.4-2.2)	1.3 (0.4-3.7)	3.3 (1.2-8.9)	4.9 (0.9-26.4)	9.8 (1.4-108)

tions with friend and neighbour support networks, frequency of contact with relatives was unrelated to age, social class, income, or housing quality. Gender was related neither to the number of friends available for support, nor to the frequency of their contact. Five of the six SSDs were associated with pervasive depression. These were living alone, odds ratio 1.9 (1.2-2.9), having no supportive neighbours, OR 1.6 (1.0-2.5), having one or less supportive friends, OR 1.8 (1.1-2.8), being upset or bothered about a relationship with a child, OR 2.9 (1.3-6.1), and lacking satisfaction with support from friends, OR 3.5 (1.7-7.3). Seeing a relative less often than once a week showed a borderline association, OR 1.3 (0.8-2.0). There was also a strong graded relationship between the number of SSDs and depression (Table 3). This graded relationship was only a little weaker when the two subjective measures, experiencing upset or bother with a child, and experiencing dissatisfaction with support from friends, were removed from the scale. Increasing numbers of SSDs were associated with a higher frequency of loneliness,

homecare service use, and recent change of residence and older mean age and more impaired mean handicap score. There was no interaction between any of the six SSDs, hypothesized here as vulnerability factors, and experience of life events. The odds ratios for pervasive depression associated with three or more SSDs was 2.4 (1.2-5.0) among those with no life events in the previous year and 1.7 (0.9-3.2) in those who had experienced an event. Test for common odds (significance of interaction by experience of life events) $P = 0.50$.

Loneliness

Loneliness was reported by 29% of the sample, 16% felt lonely often. Frequent loneliness was one of the strongest cross-sectional associations with pervasive depression, with an odds ratio of 12.4 (7.6-20.0). It was more common among those living alone (26%, $P < 0.00001$), among those lacking supportive neighbours (24%, $P = 0.0006$), or contact with friends (22%, $P = 0.02$), and among those upset about their relationship with a child (38%, $P = 0.01$).

Table 3. *The relationship between number of social support deficits (SSD's) and loneliness, handicap, change of residence, service use, and age*

SSDs	Frequency	Loneliness prevalence (%)	Homecare service use prevalence (%)	Moved home in the last five years (%)	Mean handicap score (s.d.)	Mean age (s.d.)	Depression prevalence (%)	Odds ratios for pervasive depression
0	94	3	1	4	84 (2)	72.8 (6.4)	10	1.0 (ref)
1	187	7	7	9	83 (2)	73.5 (6.9)	14	1.5 (0.7-3.9)
2	200	20	16	15	77 (2)	76.0 (7.4)	18	2.0 (0.9-5.0)
3	123	24	22	19	73 (2)	78.2 (7.0)	19	2.4 (1.0-6.2)
4	38	37	32	11	66 (2)	78.2 (7.6)	34	4.8 (1.7-14.5)
5 or 6	12	58	42	17	66 (2)	78.1 (9.3)	75	17.9 (3.9-98.8)
χ^2/F ratio		47.0*	47.0*	8.6*	10.6†	10.7†	—	23.3*
<i>P</i>		< 0.00001	< 0.00001	0.03	< 0.0001	< 0.0001		< 0.00001

* Mantel-Haenszel χ^2 (test for linear association).† *F*-ratio (ANOVA).

Women (19%) were more likely to be lonely than men (12%, $P = 0.02$), and subjects aged over 82 experienced higher rates of loneliness (24%, $P = 0.03$) than lower age groups. Loneliness was least frequent in better quality private housing (10%), intermediate in the large local authority housing blocks (17%) and highest in local authority houses (21%, $P = 0.07$). There was no relationship between loneliness and childlessness or frequency of contact with relatives.

Gender and marital status

The odds ratio for depression associated with female gender was 1.6 (95% confidence interval 1.1-2.6). This association was modified by subjects' marital status. Among the never married the OR was 0.4 (0.1-1.2), among the currently married, 2.3 (1.1-4.0), among the widowed, 2.2 (0.9-5.6), and among the divorced or separated, 0.8 (0.3-2.8). Therefore, the excess risk for women was greatest among the married, and among the never married the gender association was reversed, with men being at greater risk. The interaction by marital status was significant (test for common odds $P = 0.04$). Never married women had marginally larger networks of friends and neighbours, attended church more frequently and were less lonely than never married men. All of these differences were small and none reached conventional levels of statistical significance. One hundred and ninety-three (31%) of the sample were childless, including 17% of currently married subjects and 23% of widowed subjects. There was no

relationship between childlessness and depression, either in the sample as a whole, or among married, or widowed subjects.

Social class, income and housing

Social class, based on best pre-retirement occupation, was related to current income. In social classes I and II 40% of subjects received more than £100 per month in excess of their state pension, compared with 34% of social class IIIN, 27% of social class IIIM and 21% of social classes IV and V ($P < 0.0001$). Social class was also related to current housing quality; 51% of social classes I and II lived in the better quality housing compared with 12% of social classes IV and V ($P < 0.00001$). We have already seen that social class IV or V had few friends available for support and that low income was associated both with living alone and with smaller networks of friends and neighbours. Despite these associations there was no social class gradient for depression in Gospel Oak. The prevalence of depression was 19% in social class I and II, 17% in social class IIIN, 17% in IIIM and 19% in social class IV and V. Social class was unrelated to age, sex, or living alone. There was a modest univariate association between low income and depression, already reported in the accompanying paper. This association no longer obtained after adjusting for the confounding effects of age and number of SSDs. There was no relationship between the quality of housing and depression in Gospel Oak. However, those subjects who had spent five or less years in their current home were at increased

Table 4. *Final multivariate model, demonstrating the association between pervasive depression and social support deficits (SSDs), change of residence, gender, age and recent serious life events*

Exposure	Odds ratio (95% confidence intervals)	Likelihood ratio statistic
Number of SSDs		
None	1.0 (ref)	25.3
1	1.4 (0.6–3.1)	
2	1.7 (0.7–3.8)	
3	1.9 (0.8–4.5)	
4	3.9 (1.4–10.9)	
5 or 6	17.5 (4.1–74.3)	
Change of residence in last 5 years	2.4 (1.3–4.3)	6.7
Female gender	1.7 (1.1–2.7)	6.0
Age		
65–69	1.0 (ref)	9.2
70–74	0.4 (0.2–0.8)	
75–81	0.6 (0.3–1.1)	
≥ 82	0.9 (0.5–1.6)	
Life events in last year		
None	1.0 (ref)	6.7
One	1.7 (1.1–2.9)	
Two or more	1.9 (1.0–3.3)	

risk of depression, odds ratio 2.3 (1.3–3.9). Adjusting for the number of SSDs only marginally weakened this association.

Multivariate modelling

The most parsimonious model included loneliness, odds ratio 12.7 (95% confidence intervals 7.8–20.6), and recent change of residence, odds ratio 2.5 (1.4–4.7) with a combined likelihood ratio statistic of 117 on 2 df. An alternative model centred around the number of social support deficits also included age, sex, and life events, in addition to recent change of residence, with a combined likelihood ratio statistic of 53 on 12 df (Table 4).

DISCUSSION

Life events

The Bedford College Life Events and Difficulties Schedule (LEDS) (Brown & Harris, 1978) elicits events in a lengthy recorded interview, rated independently for contextual threat by a trained panel. Studies using this method have shown that depressed older subjects have experienced

more recent life events than non-depressed subjects (Murphy, 1982). However, older samples differ from younger ones in that chronic difficulties are more prevalent than life events (Davies, 1994*a, b*) and health difficulties are an important source of adversity (Murphy, 1982; Davies, 1994*b*). Evidence for a relationship between depression in older age and life events measured using checklists (Linn *et al.* 1980) is weaker than for LEDS based studies, with some failures to replicate (Cutrona *et al.* 1986; Smallegan, 1989; Murrell *et al.* 1991; Hurwicz *et al.* 1992). In our study, we used a checklist of events known to carry high contextual threat, the List of Threatening Events (LTE). Depressed subjects reported more life events than non-depressed subjects up to 2 years before interview. The occurrence of life events was independent of age, gender, social class, living circumstances and social support. There was, therefore, no evidence to support the notion that other risk factors for depression might make a subject 'event prone', creating a spurious association between life events and depression. However, the only common event found to be associated with depression was the onset of a serious illness in the subject. Interestingly the excess risk of depression associated with illness, and with the rarer event of a bereavement in the immediate family, was concentrated in the first 6 months after the event. The effect of a theft or a serious financial crisis lasted longer with elevated odds ratios observable for events occurring even 2 years previously. Perhaps the enduring life circumstances favouring the theft or financial crises, rather than the event itself, predisposed towards depression. Also bereavement and illness, unlike theft and financial crisis are often expected 'on-time' events, in the face of which support can be mobilized and adaption can take place via established mechanisms. Theft was a disturbingly common event in Gospel Oak, even given that serious losses were also included in this category; about one in eight subjects had experienced at least one theft or loss over the previous 2 years.

Social support and loneliness

Brown demonstrated in a younger sample that lack of social support and negative self-esteem were vulnerability factors, increasing the risk of depression in the presence of a life event (Brown

et al. 1986). Murphy reported a similar vulnerability for older subjects lacking a confiding relationship (Murphy, 1982). Not all studies have replicated this finding. Murrell found a direct protective relationship between self-esteem and depression, but noted that neither self-esteem nor health modified the association between life events and later depression scores (Murrell *et al.* 1991). There is stronger evidence in Gospel Oak for a direct association between lack of social support and depression than for the alternative hypothesis that lack of social support acts as an effect modifier, increasing the risk of depression in the presence of a life event. The two most striking risk factors for depression in this analysis were loneliness and the number of social support deficits (SSDs). Each SSD was modestly associated with depression and the strong graded relationship between the number of SSDs and depression suggested a potent cumulative influence. The testing of the alternative hypothesis is weakened because of the blurring of temporal relationships in the cross-sectional design, in which social support and depression were measured concurrently, but preceding life events were retrospectively identified. Brown *et al.* suggested that it is the mobilization of support in the face of a life event that is crucial to the onset of a depression (Brown *et al.* 1986); this sequence is best observed prospectively. Since this was a cross-sectional study, we also cannot be sure that the depressed mood did not bring about the SSD rather than vice versa. Reverse causality is particularly likely with the last two of the six deficits, which measure the subject's satisfaction with support provided. However, prospective studies have shown that subjective support measures may be predictive of the onset (Henderson, 1981) and course (George *et al.* 1989) of depression. Also, depression can be associated in the short- to medium-term with improvements in social support (Blazer, 1983). In any event, omitting the two subjective SSDs did not substantially weaken the association between number of SSDs and pervasive depression.

The association between loneliness and depression was not an *a priori* hypothesis. Also, the subjective experience of loneliness is likely to be influenced by current mood. Furthermore, the item indicating the frequent experience of

loneliness was one of the SHORT-CARE items contributing to the depression diagnostic scale, used in turn to define pervasive depression. Perhaps we should not be surprised at the strength of the cross-sectional association between depression and loneliness. Equally, we should not dismiss it. At least one prospective study has identified loneliness in the elderly as an independent risk factor for the later onset of depression (Green *et al.* 1992). A plausible mechanism is suggested by an earlier observation that it was desolation, the loss of intimate relationships, rather than isolation which characterised loneliness (Revenson & Johnson, 1984). In our survey loneliness was associated with most of the social support deficits, but it was not synonymous with living alone. Living alone was a much weaker risk factor for depression. Those who lived alone confounded stereotypes by having similar numbers of supportive friends and neighbours, and equivalent levels of community involvement to those not living alone. It seemed that it was the accumulation of SSDs which best predicted the subjective experience of loneliness. Some network domains however were more important than others; frequency of contact with, and availability of friends and neighbours were related to loneliness, whereas contact with relatives and childlessness were not. While older people typically receive instrumental support from spouses and relatives, they value friends for the companionship and emotional support which they can provide (Lee, 1985). It is interaction with friends, rather than contact with relations, which best predicts well-being (Bowling, 1994). Loneliness may be a good target for intervention. Two Scandinavian intervention studies, aiming to improve the social networks and social activity of older people reported that loneliness was among the more responsive of the quality of life variables to the social intervention (Arnetz, 1985; Andersson, 1985).

Marital status, gender and spousal bereavement

Marriage is associated with low mortality and good health, although this protective effect seems to be stronger for men than for women (Jacobs, 1977; Berkman & Syme, 1979). In younger people marriage protects against depression among men but not among women (Gove, 1972). In Gove's study the excess of depression in

women relative to men was greatest in married people. This striking finding has been variously attributed to the mundanity of housework and the unfavourable position of women who work outside the home (Gove, 1972), to the differences in the number and range of role identities by gender and marital status (Thoits, 1986), and to the burden of childcaring (Elliot & Huppert, 1991). Brown *et al.* drew attention to the lack of satisfaction with marriage expressed by working class Camberwell women (Brown *et al.* 1986). We confirm that marriage seems to confer protection against depression for men while placing women at greater risk relative to never married women. This is the first time that this effect has been shown to persist into older age. The role of women in society has evolved since the 1960s when some of the important work on the gender difference in depression was carried out (Elliot & Huppert, 1991). However, many of our sample would have started work and brought up children in the 1940s when gender roles were more polarized than among contemporary young adults. Conversely, gender differences may have attenuated in our sample as children grew up and left home, and both sexes gave up any paid employment. A Finnish prospective study showed that for men the risk of onset of depression over 5 years is increased for those having poor emotional relations with their wives, while for women the risk is greatest among those not living alone at the beginning of the follow-up period (Kivela, 1994). These findings led Kivela to suggest that marital counselling should be made available for older people. We have no direct measure of the quality of marriages in Gospel Oak. Non-marital factors may also be important, to the extent to which they affect wives and husbands and single men and single women differently. There are large reported differences between the social support networks of older men and women, women typically having more supportive and extensive networks of friends than men (Fischer & Phillips, 1982). In Gospel Oak never married men reported fewer friends and neighbours, less attendance at clubs or church, and more loneliness than never married women. None of these differences reached statistical significance, but numbers were small and the trends were all in the same direction. Another area worthy of investigation is the relative health of male and female marital

partners. A national United States survey showed that 64% of all spousal carers were wives, suggesting that in older age the burden of care in marriages may generally derive from the husband and devolve on the wife (Stone *et al.* 1987).

Given the protective effect of marriage for men, it is initially surprising that bereavement should be more strongly associated with depression in women than in men. This finding has been reported before; Los Angeleno widows showed higher levels of depression in the immediate aftermath of bereavement than did widowers (Thompson *et al.* 1991). However, levels of grief were similar in the two groups. While depression subsided before the end of the first year, grief persisted in both genders up to 30 months after the bereavement. The authors interpreted this finding as indicating that there was a gender difference in the expression of depression but not in the expression of grief.

Social class

Social class as measured in Gospel Oak, by best pre-retirement occupation seemed to retain validity after retirement. It related to retirement income, housing quality, and social network. In contrast with the prevailing view, we did not find a social class gradient for depression. Brown & Harris reported that working class women with children at home were four times more likely to have experienced a depression than middle class women (Brown *et al.* 1986), an effect mediated mainly by the higher prevalence of vulnerability factors among working class women. A less dramatic social class effect was seen in an older sample (Murphy, 1982), the excess depression among the lower social classes largely explained by their poorer health and greater social difficulties. There was also no relationship in Gospel Oak between housing quality and depression, and the relationship between income and depression was confounded by age and social support deficits. Social adversity may need to be understood as a neighbourhood as well as a personal factor. The restriction of our study to one small area may have constrained its variance.

Conclusion

The accompanying paper identified handicap as a major determinant of the distribution of

depression. This paper identifies two more factors, the frequent experience of loneliness, and social support deficits, showing very strong cross-sectional relationships with depression. The three risk factors are strongly associated with each other. Problems of collinearity mean that it is unrealistic to attempt to decide their relative primacy in a multivariate analysis. It is for that reason that two multivariate models are presented in this paper, one centred around loneliness, the other based on the number of social support deficits. Even a longitudinal study, charting the temporal order of transitions between mood states and between exposure levels, may not entirely disentangle these complex relationships, because, for both exposures and outcome, the rate of transition may be small in relation to the stable prevalence of the condition. Under these circumstances cross-sectional surveys may be an important source of information for identification of appropriate public health interventions. The clustering of handicap, loneliness, lack of social support and depression would seem, *prima facie*, to define a group of older people with a poor quality of life. The immobility associated with physical illness, leading to isolation within the home, limited contact with friends and neighbours in the local area, and a consequent loss of intimacy and reduced sense of community could be hypothesized as underlying mechanisms. Many of these problems might with modest investment of funds be tackled at the population level, through the concerted action of a coalition of existing community volunteer organisations, tenants' associations, local authority housing departments, housing associations and primary health care and social services. Qualitative interviewing, both of the older population and service providers would help to identify feasible interventions. Could a population-wide intervention have an impact on the prevalence of depression in an area like Gospel Oak? In three surveys over the last 5 years this has remained stable at or around 17% of the over 65-year-old population. Other studies using similar instruments and methods, but in differently organized societies, here and abroad, have reported much lower prevalence rates (Dewey *et al.* 1993).

Please refer to accompanying paper (*ibid.* p. 320) for acknowledgements.

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