Age and Ageing 2002; **31:** 165–168

Low level social engagement as a precursor of mortality among people in later life

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Abstract

Objective: to examine if a low level of social engagement is a precursor for mortality.
Methods: a case-control design, controlling for physical health, age and sex examining social engagement and morale. We took measures on 3 occasions, 4 years apart.
Results: a low level of social engagement was an important precursor of 8-year mortality. There were intermediate significant differences for social engagement, physical health and morale.
Conclusions: levels of social engagement either have a direct effect on mortality, or represent hidden health problems, acting as a marker for later ill health. Social engagement may also have a role in intermediate declines in physical health and morale.

Keywords: *later life, longitudinal, mortality, social participation*

Introduction

Social aspects of ageing have a role in maintaining physical health and can be considered under three broad headings: networks [1, 2]; support [3–5]; and participation [6, 7]. Similarly, three broad headings encompass the studies of physical health: disability [8, 9]; morbidity [10, 11]; and mortality [12, 13]. The consensus is that the social world does contribute to physical health but its specific nature is more difficult to articulate. One reason for this is that different studies use different assessments. However, one more straightforward method of studying physical health is to examine mortality.

Increased network size has been found to provide direct protection from the risk of mortality; men benefited from smaller networks than women [2]. A 14-year Danish study found that, when initial health was controlled for, the quality of the network was significantly associated with longevity [14]. However, many measures of networks were too rudimentary to delineate the networks and in consequence, it is often difficult to understand the precise relationships between network size and physical health, and by inference, mortality [1].

An area of social interaction which often confounds with social networks is social support. Several studies have examined networks and support in relationship to mortality [3, 4]. A historical study found that familial social support was a predictor of mortality, both the receipt of and the giving of social support reduced mortality risks [15]. Other studies have examined the direct and buffering-effects of social support on mortality [5, 16]. However, others suggest that social participation may act protectively, buffering older people from mortality [13, 17].

The third social aspect of ageing is participation. Social participation, or social engagement, represents an active engagement (either actual or symbolic) with the social world and implies that people are choosing to participate [6, 7, 18, 19]. In early research, two contrasting theories were advanced: disengagement theory [20]; and activity theory [21, 22]. The former argued that reductions in social activities in later life were natural. In contrast, proponents of activity theory argued that it was beneficial to keep active and to develop new social contacts. Recent research has tended to support the latter theory. Specific activities such as volunteering, church attendance and seeing friends were associated with a reduced mortality, while lack of social participation predicted mortality after cardiac surgery [7, 23].

Two difficulties presented by research into the relationship between social participation and mortality are

those of inconsistency in assessment and of definition. There are advantages therefore in using a precisely defined and validated measure. One such measure is the Brief Assessment of Social Engagement (BASE) [19]. This measure was designed to assess both actual and symbolic participation in the social milieu specifically for people in later life.

Additional challenges are the confounding effects of age, sex and baseline physical health. Physical health may decline with age and so may social participation [20, 21]. It is important to control for age in any study of mortality and social participation. Similarly, sex should be controlled for, since social participation varies between men and women [24, 25]. Baseline physical health also needs to be controlled for, otherwise it is not possible to establish whether social participation *per se* is a precursor for mortality.

We designed this study to meet these challenges. Participants were matched on age, sex and physical health at first interview (T1) and were assigned to one of two groups: those who were still alive eight years at third interview (T3); and those who had died. We hypothesised that T1 levels of social participation would be precursors for later mortality. In addition we took measures of morale at T1 and four years later at second interview (T2) and physical health was also measured at this intermediate point.

Method

We derived data from the Nottingham Longitudinal Study of Activity and Ageing (NLSAA), full details of which are presented elsewhere [26]. Briefly, the NLSAA is an 8-year survey of activity, health and well-being conducted within a representative sample of people originally aged 65 and over living at home. We conducted the baseline survey for the NLSAA between May and September 1985 (T1), during which time 1042 people, randomly sampled from general practitioners' lists, were interviewed in their own homes (a response rate of 80%). The sample was demographically representative of the British elderly population.

We conducted follow-up surveys at four yearly intervals in 1989 (T2) and 1993 (T3), with re-interview rates of 88% ($n=690$) and 78% ($n=410$) respectively obtained among survivors. At T1 there were 406 men and 636 women. At T2 there were 259 men and 431 women. At T3 there were 139 men and 267 women with complete marital status information.

Questionnaire assessment

At each survey wave, we assessed general health using a 14 item health index scored from zero (no health problems) to 14 (multiple health problems) covering the presence or absence of: heart, stomach, eyesight, sleep, or foot problems; giddiness, headaches, urinary incontinence, arthritis and falls; long-term disabilities and drug and walking aid use, and contact with (primary and secondary care) medical services [26].

We assessed levels of social participation using the Brief Assessment of Social Engagement (BASE) scale developed specifically for the NLSAA study [19]. This additive scale contained 20 dichotomously rated items (yes=1; no=0) covering both actual (e.g., voting, attending religious services, taking holidays, library attendance) and symbolic engagement (e.g., writing letters, reading newspapers/magazines, TV and radio access).

Assessments of morale were provided by a modified version of the 13-item Life Satisfaction Index [27].

We ascertained mortality in two ways: first, by information obtained by the research team at T2 (1989) and T3 (1993); and second, with confirmation from death certificates.

Participants

The sub-sample consisted of 154 (77 men) people who had died between T1 (1985) and T3 (1993), named the 'deceased', and 154 (77 men) people who were still alive at T3, named the 'alive'. All participants had a health index score of $\leqslant 5$ at T1. Participants were matched for age (± 5), sex and for T1 health index score. By T2, 34 men and 40 women had died.

Analyses

We analysed the data using independent *t*-tests for equal numbers at T1 and unequal numbers at T2 (since there were deaths between T1 and T2). The independent variable was survival (alive or deceased) at T3 (1993) and the dependent variables were social engagement and morale at T1 (1985) and social engagement, morale and health at T2 (1989). The T1 data were also analysed using a discriminant analysis assessing the accuracy of the independent variables in predicting mortality. The grouping variable was alive/deceased and the independent variables were social engagement and morale.

Results

Table 1 shows the means and standard deviations comparing the groups of alive and dead people at T1 and T2. There was significant difference between the groups for age [$t(307)=1.29$, $P<0.199$] at T1.

Significant differences were found for social engagement at T1 [$t(303)=-3.36$, $P<0.001$], with the deceased having lower levels. At T1, no other dependent variables were significant (Table 2). Only social engagement was significant in the discriminant analysis [equivalent $F(1, 303)=11.57$, $P<0.0008$], classifying 58.19% correctly.

At T2, we found significant differences for social engagement [$t(230)=-3.12$, $P<0.002$], morale [$t(225)=-2.64$, $P<0.01$] and health [$t(226)=2.39$, $P<0.02$].

Table 1. Means and standard deviations for the two groups, deceased and alive at T1 (1985) and T2 (1989)

			Dead		Alive
	Time	*n*[a]	Mean (SD)		Mean (SD)
Age	T1	154	73.46 (4.1)	154	72.87 (3.97)
Health index	T1	154	2.88 (1.48)	154	2.96 (1.52)
	T2	76	4.74 (2.07)	152	4.07 (1.96)
Social engagement	T1	154	12.48 (2.86)	154	13.54 (2.63)
	T2	78	10.63 (3.57)	154	12.14 (3.29)
Life satisfaction index (morale)	T1	151	17.68 (4.94)	154	18.1 (4.95)
	T2	73	16.03 (4.6)	154	17.84 (5.25)

[a]Complete data sets.

Table 2. *t*-tests comparing alive and deceased groups at T1 (1985) and T2 (1989)

	Time	*t*	df	*P*
Age	T1	1.29	306	0.199
Health index	T1	−0.23	306	0.82
	T2	2.35	142.47	0.02
Social engagement	T1	−3.36	306	0.001
	T2	−3.12	144.07	0.002
Life satisfaction index	T1	−0.73	302.91	0.46
	T2	−2.64	159.75	0.01

df, degrees of freedom.

Those who had died by T3 had lower levels of social engagement and morale, and poorer health than those who were still alive.

Discussion

The results provide evidence that when health, age and sex are controlled for, low level social engagement acted as a precursor for mortality. Significantly lower levels of social engagement were found for those who died than for those who survived. This is confirmed by the discriminant analysis, which showed that low level social engagement predicts mortality. The results further confirm that in the intervening assessment social engagement, morale and physical health were also significantly different between those who survived and those who did not.

The evidence suggests that social engagement has a direct effect, since physical health is controlled for. Had the effect been indirect, other variables included in the analysis might also have been significant. Since health was controlled for, it is not possible to say whether social engagement would be mediated by health, though that is also likely. However, the evidence suggests that low level social engagement on its own exercises an adverse effect on mortality. Perhaps low level social engagement signals unrecognised health problems. For example, while the health problems themselves may not yet be acknowledged by the older person, their more subtle effects may make an effect on social engagement. In this way, social engagement may be acting as a marker for later health problems and mortality. The data do not allow an exploration of this question. The evidence supports an activity theory position rather than a disengagement one [20, 21].

In other studies different designs have been used, often using multivariate logistic regression. In the current design, we matched survivors at T1 for age and sex with those who had subsequently died. Physical health was also controlled. We selected participants on the basis of good physical health. It was important also to control for age and sex since both affect survival. One of the methodological challenges of this type of design is that it is not strictly possible to say whether low social engagement determines mortality, only that those who die do have significantly lower levels of social engagement than those who do not.

At T2, variables other than social engagement come into play. A low level of social engagement, as one would expect, still acts as a marker for mortality. However, both physical health and morale also act as precursors. Those who later die were more likely to have poorer health and/or morale. In this situation, it is no longer possible to argue that social engagement has a direct effect. This may be the case, but it is now possible that either poorer health and/or lower morale influence social engagement.

There are also two methodological points to note. First, health is now a free-ranging variable with scores across the whole range (from 0–14), whereas at T1 levels of health were controlled for. Second, between T1 and T2 a number of people in the deceased group had died. Therefore, the T2 sample is no longer precisely representative of the T1 sample. This is interesting in its own right, since it is evidence of a direct link between social engagement and mortality. After all, these participants had relatively good health at T1, but were already dead at T2.

To conclude, in this study we present evidence which suggests that social engagement acts as a sole precursor for later mortality. We suggested that social engagement may have a direct effect on mortality when health, age and sex are controlled. There is evidence, too, that intermediate levels (T2) of social engagement, morale and health also contribute to mortality.

Key points

- Low level of social engagement acts as a precursor for mortality.
- A low degree of social engagement is directly related to mortality.
- Social engagement predicts intermediate declines in physical health and morale.

Acknowledgements

The Nottingham Longitudinal Study of Activity and Ageing is supported by grants from The Grand Charity, Help the Aged, the PPP Medical Trust and from Trent Regional Health Authority. The author would also like to thank the three anonymous reviewers for their comments.

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Received 25 June 2001; accepted in revised form 26 November 2001