

Loneliness, social support networks, mood and wellbeing in community-dwelling elderly

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SUMMARY

Objective Both loneliness and social networks have been linked with mood and wellbeing. However, few studies have examined these factors simultaneously in community-dwelling participants. The aim of this study was to examine the relationship between social network, loneliness, depression, anxiety and quality of life in community dwelling older people living in Dublin.

Methods One thousand two hundred and ninety-nine people aged 65 and over, recruited through primary care practices, were interviewed in their own homes using the GMS-AGECAT. Social network was assessed using Wenger's typology.

Results 35% of participants were lonely, with 9% describing it as painful and 6% as intrusive. Similarly, 34% had a non-integrated social network. However, the two constructs were distinct: 32% of participants with an integrated social network reported being lonely. Loneliness was higher in women, the widowed and those with physical disability and increased with age, but when age-related variables were controlled for this association was non-significant. Wellbeing, depressed mood and hopelessness were all independently associated with both loneliness and non-integrated social network. In particular, loneliness explained the excess risk of depression in the widowed. The population attributable risk (PAR) associated with loneliness was 61%, compared with 19% for non-integrated social network. Taken together they had a PAR of 70%

Conclusions Loneliness and social networks both independently affect mood and wellbeing in the elderly, underlying a very significant proportion of depressed mood. Copyright © 2009 John Wiley & Sons, Ltd.

KEY WORDS—loneliness; social support networks; depression; hopelessness; wellbeing

INTRODUCTION

Humans are social beings. Baumeister and Leary (1995) have even proposed that our need to belong is a fundamental one, driving thoughts, emotions and interpersonal behaviour. Older adults are no exception. Depp and Jeste (2006) reported that older adults more commonly endorse social engagement than physical health when describing successful ageing.

There is now clear evidence for the health-promoting effects of social relationships (Fratiglioni *et al.*, 2004), with socially isolated people having a

two- to four-fold increase in all-cause mortality. There are several pathways by which social relationships may affect health, one of which may be in the provision of social support. Deficits in social support have been associated with a wide variety of adverse health outcomes in older age (Uchino, 2006; Reblin and Uchino, 2008), ranging from physical health to depression and self-harm (Dennis *et al.*, 2005).

Aside from objective deficits, social relations may be subjectively deficient. Loneliness is the subjective experience of social isolation. It has been defined as an unpleasant subjective state of sensing a discrepancy between the desired amount of companionship or emotional support and that which is available in the person's environment (Blazer, 2002). The health effects of loneliness have been less well studied than

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those of social networks, however, loneliness has been associated with a variety of negative health outcomes (O'Lunaigh and Lawlor, 2008), including an increased risk of all cause mortality (Seeman, 2000), and of suicide (Waern *et al.*, 2003). The lonely have an increased risk of depression (Cacioppo *et al.*, 2006) and one study reported that the excess mortality in the elderly depressed was confined to those who were lonely (Stek *et al.*, 2005).

Few epidemiological studies have clearly distinguished between objective and subjective social isolation, but among those that have, some evidence supports a significant adverse effect of each on health (Cacioppo and Hawkey, 2003; Cacioppo *et al.*, 2006; Cole *et al.*, 2007).

In this study, we attempt to identify the relative contributions of subjective social isolation (loneliness) and objective social isolation, measured as support network type, to wellbeing, depression and hopelessness in a large representative sample of community-dwelling people aged 65 and over.

METHODS

Participants and measures

Community-dwelling people aged 65 and over were recruited from the registers of five Dublin urban general practices between 1993–2002 as part of the DAHMS study. The sex and age of the sample is similar to those of the 1991 population census for the elderly Dublin population (Kirby *et al.*, 2000). Ethical approval for the study was given by the Federated Dublin Hospitals Ethics Committee. Consenting participants were interviewed at home. Ratings of psychiatric symptoms were made using the Geriatric Mental State (GMS) diagnostic interview, which is administered using a computerised semi-structured interview, the GMS-AGECAT (Copeland *et al.*, 1988).

Loneliness was based on three GMS items. The first item asks 'Do you feel lonely?'. This item will be referred to as 'simple loneliness'. The second rates whether the participant 'cannot turn away from' their loneliness. It will be referred to as 'intrusive loneliness'. The third, rates being 'bothered or distressed by current loneliness'. We will refer to this property as 'painful loneliness'.

Social networks were assessed using the Practitioner Assessment of Network Type schedule developed by Wenger (Wenger, 1991; Wenger and Tucker, 2002). The schedule classifies social network into one of five types. In this analysis, we will contrast

those with a locally integrated social network, identified by Wenger as optimal in older age, with those having any other sort of network.

Persistent depressed mood present in the month prior to interview was assessed using GMS symptom rating.

Presence of *hopelessness and suicidal feelings* was assessed using GMS ratings on five symptoms: whether life was seen as not worth living, seeing the future as bleak, having a general feeling of hopelessness or despair, wishing to die in the month prior to interview, and death wishes expressed as either suicidal plans or acts or wishing to be dead but rejecting suicide.

Wellbeing was assessed using two GMS items, *life satisfaction and happiness*. The presence of significant *physical disability* was rated by the interviewer. *Cognitive impairment* defined as a score of less than 24 on the Mini-Mental State Examination of Folstein *et al.* (1975).

Demographic and personal data were collected using the minimum dataset designed for the Ageing in Liverpool: Health Aspects (ALPHA) study (Saunders *et al.*, 1993).

Statistical methods

Data were analysed with Stata/SE, release 10. The effects of risk factors were calculated using logistic regression and are expressed as Odds Ratios (OR). Logistic regression was also used as a basis for calculating prevalences adjusted for confounding factors. We calculated the attributable risk fraction in the population and in the exposed, based on predicted prevalences derived from logistic regression, as a measure of the effect size of loneliness and social network on risk of depression corrected for confounding factors.

RESULTS

There were 1,342 participants. We omitted 44 participants in whom social network could not be classified, leaving a final sample of 1,299, of whom 64% were women. The median age was 73. Almost half (49%) were currently married, with 38% widowed. Women differed from men in their marital status, being more likely to be widowed (47%) than men (23%, $p < 0.001$). The majority (71%) were in the manual social classes, with 19% classed as unskilled manual. Significant physical disability was present in 11% of participants, and cognitive impairment in 14%.

Two-thirds of participants (861, 66%) had a locally integrated social network. Of the remainder, 273 (21%) belonged to the network types described by Wenger as 'restricted', of which most (73%) belonged to the 'family dependent' type. Finally, 165 participants had 'transitional' networks, intermediate between the locally integrated and restricted types. Preliminary data analysis suggested no differences between the various types of restricted and transitional networks. The analysis which follows will thus contrast locally integrated networks with all non-integrated types of network.

Roughly one-third of participants [34.8%; 95% Confidence Intervals (CI) 32.2–37.4%] reported loneliness in the previous month. Prevalence of painful loneliness was 9.1% (95% CI 7.7–10.8%) and that of intrusive loneliness was 6.1% (95% CI 5.0–7.6%). While painful and intrusive loneliness were correlated ($p < 0.001$, Chi-squared test) there was considerable non-overlap between the two features. While 145 participants (10.2%) reported one or other feature, only half of these (71 participants) reported both.

There was significant overlap between loneliness and social isolation in our sample; 40% of those with a non-integrated network were lonely, and a similar percentage (39%) of the lonely had a non-integrated network. While a non-integrated network was a risk factor for loneliness, nevertheless 32% of participants with an integrated social network were lonely, underlining the distinctness of the constructs.

Table 1 shows the factors associated with non-integrated network type and with loneliness. Non-integrated network type was associated with age, with an adjusted OR of 1.5 for each 10-year increase in age. It was more common in those who had never married. It was associated with both physical disability and

with cognitive impairment in univariate analysis, but only with physical disability in multivariate analysis. Although not associated univariately, living alone was associated with a lower prevalence of non-integrated network type in multivariate analysis.

Loneliness, on the other hand, increased with age only in univariate analysis. When other factors significantly associated with loneliness—never having married, widowhood, living alone and disability—were controlled for, there was no effect of age on prevalence. Likewise, although men were less lonely univariately, this difference was not significant once other factors had been adjusted for. It is notable that living alone, although associated with a lower prevalence of non-integrated networks was associated with a higher prevalence of loneliness.

Loneliness, network and well-being

We examined self-rated life satisfaction and happiness as key indices of hedonic wellbeing. Adjusted for age, physical disability, living alone and never having married, being lonely was associated with a lower probability of being very happy (OR = 0.29, $p < 0.001$) or being satisfied with one's life (OR = 0.34, $p < 0.001$). Likewise, having a non-integrated social network was associated with a decreased odds of being very happy (OR = 0.75, $p = 0.040$) and being satisfied with one's life (OR = 0.53, $p < 0.001$). These associations remained similar when depressed mood was added to the model (data not shown).

Loneliness, network type and depressed mood

There was an 8.8% prevalence of depressed mood (95% CI 7.5–10.5%). Figure 1 shows the overlap of

Table 1. Univariate and multivariate predictors of loneliness and of non-integrated social support network In 1,299 participants

	Non-integrated social network 33.7% (95% CI 31.2–36.3%)		Loneliness 35.3% (95% CI 32.8–37.9%)	
	Odds ratio (CI)	Multivariate Odds ratio* (CI)	Odds ratio (CI)	Multivariate Odds ratio* (CI)
Male sex	1.0 (0.81–1.3)	1.1 (0.86–1.4)	0.53 (0.42–0.69)	0.82 (0.62–1.1)
Age (10-year increase)	1.6 (1.3–1.9)	1.5 (1.3–1.9)	1.3 (1.1–1.6)	0.92 (0.75–1.1)
Married	baseline			
Never Married	1.8 (1.3–2.5)	2.1 (1.4–3.1)	0.95 (0.67–1.3)	1.7 (1.1–2.6)
Widowed	1.0 (0.78–1.2)	1.1 (0.82–1.6)	4.4 (3.5–5.6)	3.9 (2.7–5.6)
Lives alone	0.91 (0.71–1.2)	0.71 (0.51–0.99)	3.6 (2.8–4.6)	1.6 (1.2–2.3)
Manual SEG	1.0 (0.81–1.3)	1.1 (0.81–1.4)	0.80 (0.62–1.0)	0.79 (0.60–1.0)
Physical disability	1.7 (1.2–2.4)	1.6 (1.2–2.3)	1.4 (1.0–2.0)	1.5 (1.0–2.2)
MMSE < 24	1.7 (1.2–2.3)	1.3 (0.92–1.8)	1.0 (0.74–1.4)	0.83 (0.57–1.2)

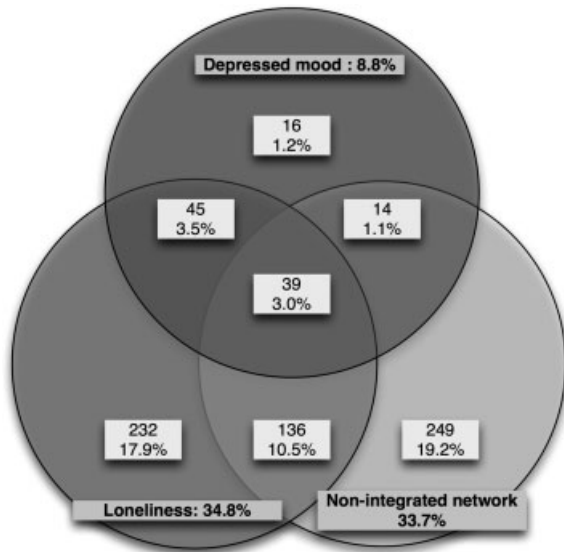


Figure 1. The overlap between loneliness, non-integrated social network and depressed mood.

loneliness, non-integrated social network and depressed mood. It was rare for depression to occur outside the context of loneliness and non-integrated social network: only 16 (14%) of the 114 participants who had depressed mood were neither lonely nor had a non-integrated network. A total of 84 of those with depressed mood were lonely (74%), while 53 (46%) had a non-integrated network.

We used logistic regression to examine the effects of social network and extent of loneliness on prevalence of depressed mood. We included in the analysis the variables which were significant predictors of depressed mood in our sample: age, widowhood and physical disability. Non-integrated social network was associated with an OR of 1.8 ($p=0.009$) for depressed mood. All of the three indicators of loneliness were independently associated with depressed mood, with an OR of 2.5 for simple loneliness, 3.9 for painful loneliness and 4.2 for intrusive loneliness. When adjusted for the other predictors, widowhood was no longer associated with depression (OR = 1.1, $p=0.708$) but physical disability remained an independent predictor (OR = 2.6, $p=0.001$).

Figure 2 shows the predicted prevalence of depressed mood in a person aged 70 without physical disability as a function of extent of loneliness in those with an integrated and a non-integrated social network. In those with an integrated social network, predicted prevalence rose from 3% in those who were

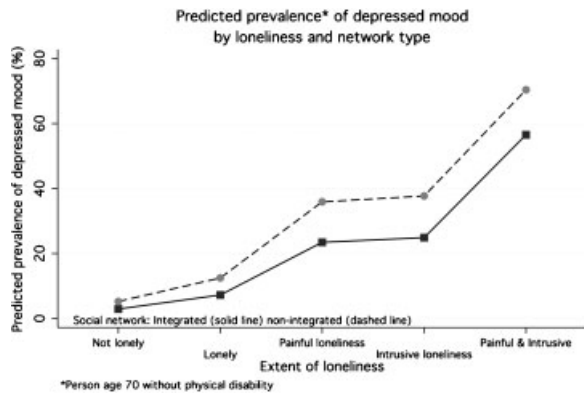


Figure 2. The predicted prevalence of depressed mood by loneliness and network type.

not lonely to 56% in those who reported both intrusive and painful loneliness. In those with a non-integrated social network, prevalence rose from 5% in those who were not lonely to 70% in those who reported painful, intrusive loneliness.

Loneliness, widowhood and depression

Prevalence of depression was significantly higher in the widowed (11%) than the non-widowed (7%). However, among the participants who were lonely, the widowed had a 17% prevalence of depression, while the non-widowed had a 21% prevalence ($p=0.287$, Chi-squared test). Among the non-lonely participants, prevalence of depression was 3.5% among the widowed and 3.6% among the non-widowed ($p=0.945$). The OR for depression associated with widowhood, adjusted for loneliness, was 0.83 ($p=0.385$). Thus, the higher prevalence of depression in widowhood is explainable by the higher prevalence of loneliness, without recourse to other factors.

Loneliness, social network and hopelessness

Overall, 16.4% of participants endorsed any of the five symptoms of hopelessness, but only 6% endorsed more than one symptom. We examined predictors of hopelessness, defined as endorsing one or more symptoms. Neither age nor sex was associated with hopelessness. On the other hand, depression (OR = 11.1, $p<0.001$) and physical disability (OR = 2.7, $p<0.001$) were strongly associated. Adjusted for these, hopelessness was associated with both non-integrated social network (OR = 2.3, $p<0.001$) and loneliness, with an OR of 2.4 for simple loneliness ($p<0.001$). Severe loneliness

(either painful or intrusive) further increased the odds of hopelessness (OR = 1.8, $p = 0.035$). There was no evidence that loneliness had a differential effect on hopelessness in non-depressed and the depressed participants ($p = 0.244$, Wald post-hoc test).

In non-depressed participants, the predicted prevalence of hopelessness, adjusted for physical disability, rose from 6% in those who were not lonely and had an integrated social network to 37% in those who experienced severe loneliness and had a non-integrated social network. In participants with depressed mood, the prevalence rose from 36% in those who were not lonely and had an integrated social network to 85% in those who experienced severe loneliness and had a non-integrated social network.

Loneliness, network and attributable risks for depressed mood

Table 2 shows the attributable risks of depression associated with loneliness and non-integrated social network. These attributable risks are calculated adjusting for physical disability and age as potential confounders. In addition, the risks associated with loneliness are adjusted for non-integrated social network and vice versa, allowing the independent contribution of each factor to depression prevalence to be assessed. Loneliness was associated, independently of age, physical disability, and social network, with 82% of the risk of depressed mood in those who were lonely, and with 61% of the risk of depression in this elderly population. Non-integrated network, on the other hand, was associated with 40% of the risk of depression in those with a non-integrated network, and 19% of the total risk of depression in the population. Taken together, the presence of either loneliness or a non-integrated social network was associated with 81% of the risk of depression in those with one or both factors, and with 70% of the overall risk of depression in the elderly population.

DISCUSSION

Loneliness and social network in older age

Loneliness is common in the elderly. In our sample, a quarter of men and 40% of women experienced loneliness. Studies of the elderly in 'Western-type' cultures have generally reported prevalences of loneliness of between 25–45% (Mullins *et al.*, 1988; Lindgren *et al.*, 1994; Holmen and Furukawa, 2002; Lauder *et al.*, 2004; Savikko *et al.*, 2005; Lauder *et al.*, 2006; Routasalo *et al.*, 2006; Victor *et al.*, 2006). We also found smaller but still significant prevalences of painful loneliness (roughly one in ten participants) and intrusive loneliness (roughly one in twenty participants), similar to Victor's finding of a 7% prevalence of 'severe loneliness' in a large UK sample (Victor *et al.*, 2005) and Hawthorn's 7% prevalence of significant perceived social isolation in an Australian community sample (Hawthorne, 2008).

Widowhood was the single most important predictor of loneliness, in common with other studies (Beal, 2006). The relationship of loneliness to age in older adults is unclear (O'Lunaigh and Lawlor, 2008). We found an increase in loneliness with age and greater levels in women. However, risk factors such as physical disability and widowhood become more common with age, and when we adjusted for these, the effects of both age and sex on prevalence became non-significant. This suggests that the rising prevalence of loneliness in older age is associated with a rising prevalence of the risk factors for loneliness, rather than an intrinsic ageing effect, and that older women have no greater intrinsic vulnerability to loneliness than men but encounter the risk factors more often.

The prevalence of integrated social network type is higher than that reported from other European studies (Kirby *et al.*, 2000). Likewise, unlike other European studies (Antonucci, 1990), we did not find a gender difference in the prevalence.

Though there was significant overlap between loneliness and social isolation in our sample, 32%

Table 2. Attributable risks for depressed mood associated with loneliness and non-integrated social network

Factor	Prevalence	Odds Ratio*	Attributable risk (exposed)	Attributable risk (population)
Loneliness	34.8%	6.4**	82%**	61%**
Non-integrated network	33.7%	1.6***	40%***	19%***
Either lonely or non-integrated network	55.0%	5.8	81%	70%

*Odds ratios and attributable risks adjusted for age, never married, lives alone, physical disability.

**Also adjusted for non-integrated network.

***Also adjusted for loneliness.

of participants with an integrated social network reported being lonely. Non-integrated social network had similar risk factors to loneliness, with two exceptions: first, those who lived alone were less likely to be socially isolated, but were more likely to be lonely. Second, widowhood was a risk factor for loneliness, but not for non-integrated social network, highlighting the distinction between objective and subjective social isolation.

Wellbeing, depression and hopelessness

The association of loneliness with depression has been constant across cultures (Cacioppo *et al.*, 2006). The current study adds to the small number of community-level studies showing the association of loneliness with prevalence of depression independently of social network type. The current study is the first to report a dose-response relationship, with the risk of depression increasing with the severity of loneliness, and the highest risk in those with painful, intrusive loneliness.

Widowhood was the most important predictor of loneliness, and the higher prevalence of loneliness in widowhood accounted for the higher prevalence of depression in this group, suggesting that assessing loneliness is important in the bereaved elderly.

While the major determinant of hopelessness was depressed mood, it is notable that even in non-depressed participants loneliness and social isolation were independently associated with hopelessness. The highest prevalence of hopelessness was in those who were depressed, lonely and socially isolated, but it is notable that the prevalence of hopelessness in non-depressed participants who were lonely and isolated was almost identical to that of depressed participants who were neither lonely nor socially isolated. Stek *et al.* (2005) reported increased all-cause mortality in the oldest old who were both lonely and depressed. They hypothesised that depression with feelings of loneliness leads to more pronounced motivational depletion and to 'giving up'. Our data support this hypothesis: loneliness and social isolation combined with depression was associated with a very high prevalence of hopelessness. The clinical importance of this constellation of loneliness, social isolation and hopelessness is underlined by the findings of Dennis *et al.* (2005) who reported that depressed elderly patients who self-harm were more hopeless, more lonely and were more likely to have a non-integrated social network than non-self-harming depressed controls, but they were not significantly more depressed.

Social networks exert a powerful effect on mental health (Antonucci, 2001). Only one previous study, by Fiori *et al.* (2006), has examined the association of network typology with depression, however the authors did not assess loneliness. In this study, subjective appraisal of social support mediated some of the relationship between social network and depression. There have been few studies which have examined both social isolation and loneliness simultaneously (Reynolds and Kaplan, 1990; Seeman, 1996; Cacioppo *et al.*, 2002; Caspi *et al.*, 2006), and, to date, no study which attempted to assess the relative importance of each factor.

In this study, while both loneliness and non-integrated social networks were associated with depression, hopelessness and wellbeing, an examination of the attributable risks for depression shows that the two factors differ in their importance at the level of the population. Almost two-thirds of the population prevalence of depressed mood in our study was associated with loneliness, and among those who were lonely over 80% of the risk of depressed mood was attributable to their loneliness. The corresponding figures for non-integrated social network are more modest, although clearly important: roughly 20% of the prevalence of depressed mood in the population was associated with non-integrated social network, and, in those with such a network, 40% of their risk of depression was attributable to their social network. These percentages are adjusted for correlates of loneliness and non-integrated social network: age, living arrangements and physical disability.

Taken together, these findings underline the importance of the social context of psychological wellbeing. Social isolation, whether subjective (loneliness) or objective (non-integrated social network)

KEY POINTS

- Loneliness and social support networks have each been associated with adverse mental and physical outcomes in the elderly, but few studies have examined both simultaneously
- In our study of 1299 Dublin elderly, each was independently associated with wellbeing, depressed mood and hopelessness
- In particular, loneliness accounted for the excess risk of depressed mood seen in widowhood
- Between them, the two factors underlie 70% of depression in the elderly, suggesting strongly that intervention trials are warranted.

accounted for 70% of the prevalence of depressed mood in our elderly sample. They also add support to Jorm's contention that it is now time to turn from observational to intervention studies (Jorm, 2005) to answer questions about the mechanisms underlying the associations and, more important, to begin to turn our current knowledge into health gain for a significant sector of the population.

CONFLICT OF INTEREST

None known.

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