**Liverpool
Public Health
Observatory**

Rapid Evidence Review Series

Loneliness
**The prevalence of loneliness, its impact on health and wellbeing and
effective interventions that can be used to ameliorate these effects.**

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PROVIDING INTELLIGENCE FOR THE PUBLIC HEALTH

Rapid Evidence Review Series
Loneliness
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Contents

Summary

Loneliness has a negative effect on health and wellbeing and leads to increased use of health and social care services. Liverpool Public Health Observatory (LPHO) was commissioned by the Merseyside Directors of Public Health, through the Cheshire & Merseyside Public Health Intelligence Network, to produce this rapid evidence review on loneliness.

Prevalence
Severe loneliness (feeling lonely all or most of the time) occurs in around 6% of the general population. Levels are highest amongst those aged under 25 (9%) and over 55 (9%). Amongst older people, those especially at risk include ethnic minority elders (24%-50%), those who are visually or hearing impaired, and those aged 80 plus. Others found to be at risk include those who are single, widowed, divorced or separated, economically inactive, living in rented accommodation or in debt and children with special needs.

Impact
Loneliness is a significant risk factor for a wide range of mental and physical health problems, including depression, high blood pressure, sleep problems, reduced immunity, cognition in the elderly and mortality. The protective effect of having adequate social relationships is thought to be equivalent to quitting smoking.

Interventions
Interventions to tackle loneliness include one-to-one interventions, such as befriending, Community Navigators and mentoring; and also social group schemes (e.g. art, discussion or writing groups); and wider community engagement. There is evidence that all of these schemes can help to reduce loneliness and improve health and wellbeing. It would appear that overall, group interventions are more effective than one-to-one support.

Critique
Prevalence estimates came from good quality UK studies, backed up with similar estimates found in other studies. The evidence on effective interventions was not always that strong and the quality of studies was variable, with further research recommended.

Recommendations

1. Introduce effective loneliness interventions, especially social group schemes, also one-to-one interventions.
2. Target interventions at a range of vulnerable groups in the community.
3. Include an evaluation component in proposals for local interventions.
4. Ensure that tackling loneliness is a consideration in all policy areas (transport etc.).
5. Encourage Health & Wellbeing Boards to take overall responsibility in joining up action on loneliness across separate local strategies.

Background

Liverpool Public Health Observatory (LPHO) was commissioned by the Merseyside Directors of Public Health, through the Cheshire & Merseyside Public Health Intelligence Network, to produce this rapid evidence review on loneliness, with a three week timescale. It is the first in a series of reviews and presents the evidence on the prevalence of loneliness, its impact on health and wellbeing and effective interventions that can be used to ameliorate these effects.

Loneliness, as defined in Box 1, has a negative effect on health and wellbeing and leads to increased use of health and social care services. There has been recent interest in the topic, with the formation in 2011 of the Campaign to End Loneliness (CEL). The CEL has recently produced a report summarising the evidence on loneliness (Bolton, 2012), and has a dedicated research website (CEL, online). A recent Research Briefing by the Social Care Institute for Excellence (SCIE) summarises interventions and outcomes for preventing loneliness and social isolation (Windle et al, 2011). Age UK have produced a similar document relating to the elderly (Age UK, 2010). The main focus of the Wirral Public Health Annual Report 2012-13 was Social isolation and its effects on health and wellbeing (Wirral Public Health Directorate, 2013).

> **Box 1. Definition**
>
> *'Loneliness'* is a psychological state. It is a subjective, negative feeling associated with lack or loss of companionship. If you feel lonely, you are lonely.
>
> *'Social isolation'* is a sociological category relating to imposed isolation from normal social networks. This can lead to loneliness and can be caused by loss of mobility or deteriorating health
> (Cattan et al, 2005; Windle et al, 2011).
>
> It is possible to be lonely whilst not isolated, for example amongst those caring for a dependent spouse with little help (Bolton, 2012).

The recent Care and Support White Paper recognises loneliness and social isolation as large problem for society as a whole (DH, 2012). In response to the White Paper, the CEL launched a 'Loneliness and Isolation' Toolkit (CEL, 2012). The toolkit explains how to best include assessments of loneliness prevalence and indicators in Joint Strategic Needs Assessments (JSNAs) and Joint Health and Wellbeing Strategies (JHWSs). The importance of tackling loneliness, depression and low self-esteem amongst those in care homes has been recognised by NICE, with the publication in December 2013 of new standards (NICE, 2013).

Research on loneliness has focussed on older people, as they are especially vulnerable to loneliness, due to loss of friends and family, loss of mobility or loss of income. However, there are many other population groups affected, as discussed below.

Methods

The review looked for evidence of loneliness amongst children and adults, age 0 to 100+ in papers published since 2000. Searches were made for estimated, modelled or survey results

on the prevalence of loneliness. Additional searches were carried out for evidence of the impacts of loneliness on health and wellbeing and on the effectiveness of interventions. Search terms used were based around combinations of 'loneliness', 'intervention', 'review' and 'prevalence', for papers since 2000. Databases searched included Medline, the NIHR Centre for Reviews and Dissemination database (CRD database) and NICE (see Appendix for further details on search results). Extensive use was made of the references gathered in the SCIE research briefing (Windle et al, 2011). Individual studies from the SCIE briefing were not always included separately in this evidence review.

The text below summarises the evidence, with further details of individual studies provided in table 1 at the end of the review.

1. Prevalence

General population

Loneliness is a common experience; with a 'U' shaped population distribution, with those aged under 25 years and those aged over 55 years demonstrating the highest levels of loneliness (Hawkley and Caccioppo, 2010, Victor and Yang, 2012).

Victor and Yang (2012) found that 6% of adults in the UK were severely lonely (defined as 'all or most of the time'). For 15% to 30% of the general population, loneliness at some level can be a chronic state (Hawkley and Caccioppo 2010).

Victor and Yang quoted from their previous study which found that prevalence of loneliness in the UK was relatively low (Victor and Yang, 2012). However, a 2014 ONS wellbeing survey found that the UK was 'the loneliness capital of Europe', with the population less likely to have people they can turn to in a crisis or to feel close to neighbours (ONS 2014).

Conflicting findings may be partly explained by different definitions and measurements being used. The terms social isolation and loneliness, although distinct concepts (see Box 1) are sometimes used interchangeably and may be tackled together in interventions. In measuring loneliness, some studies use the UCLA loneliness scale (e.g. Shevlin et al, 2013) while others devise their own measures or questions.

Older people

Amongst those aged 65 and over, between 5% and 16% report loneliness (in a review by O'Luanaigh and Lawlor, 2008). A recent longitudinal UK study by Victor and Bowling (2012) found that 9% of those aged 65 plus reported severe loneliness; 30% reported that they were sometimes lonely, and 61% reported that they were never lonely.

In the English Longitudinal Study of Ageing (ELSA), amongst those aged 52 and over, 9% said they felt lonely often and 25% said sometimes (Beaumont, 2013).

In a review of the literature, Pinquart and Sorensen (2001) noted that the available studies suggest that about 5% to 15% of seniors over 65 report frequently feeling lonely and an additional 20% to 40% report occasional feelings of loneliness. However, for the oldest people, Pinquart and Sorensen noted that loneliness is much more common, with about 50% of adults aged 80 and above often feeling lonely.

Amongst older people, those at much increased risk of loneliness include ethnic minority elders (24%-50%, Victor, Burholt et al 2012), those who are visually impaired (Alma et al, 2011), hearing impaired (Pronk et al, 2011) and those aged 80+ (Beaumont 2013).

Numbers of lonely people in the population are likely to expand, with the growing numbers of older people and the 'older-old' − those aged 80 and over (Windle et al, 2011).

Children, adolescents and middle aged adults

There is a lack of prevalence data on loneliness for other population groups. Victor and Yang (2012) found a prevalence of 9% of severe loneliness amongst those aged under 25 in the UK. A US meta-analysis of loneliness interventions by Masi et al (2011) included a literature review of prevalence and found significant levels of loneliness amongst children and adults, including the following:

- 12% of children age 5 to 6 years reported feeling lonely at school (in a 1992 study);
- 8% of children aged 8 to 11 scored in the 'lonely' range on a loneliness scale (reported in two papers from the 1980s);
- 5% to 7% of middle aged and older adults reported intense or persistent loneliness (studies in 2000 and 2005)

In a qualitative UK study of children aged between 8 and 10 years old, as many as 80% reported being lonely at least sometimes (Berguno et al 2004).

Shevlin et al (2013) noted that in previous UK research looking at adolescent loneliness, many of the studies have been based on small convenience samples and have not always used standardised measures. Shevlin's survey in Northern Ireland used the UCLA Loneliness Scale and found the prevalence of loneliness amongst those aged 16 to be 15.6%. They note this was lower than in a previous Danish review by Lasgaard in 2006 (not available in English) – concluding that the strong community links present in Northern Ireland may be a protective factor against loneliness (Shevlin et al 2013).

An NSPCC study in 2010 examined data from Childline and found that for 4% of calls, being lonely, sad or isolated was the main problem.

A review by Rubin et al (2009) found that many children who withdraw from their peers do so consistently across time and context, including in the school, home, and the larger community.

Other factors

Gender: Victor and Yang (2012), Meltzer et al (2013) and Beaumont (2013) all found a significant relationship between loneliness and gender, with more females reporting being lonely (see Table 1 at the end of the review for details). Beaumont noted that this difference occurred in all age groups, with larger differences amongst older age groups.

Social determinants: Feelings of loneliness are more prevalent in those who are single, widowed, divorced or separated, economically inactive, living in rented accommodation or in debt (Meltzer et al, 2013; Beaumont 2013).

Children with special needs or autism were found to have relatively high levels of loneliness (Bossaert et al, 2012, Lasgaard et al, 2010).

There is also evidence that hereditary factors and certain personality types predispose to loneliness (O'Luanaigh and Lawlor, 2008). In one study in the review by O'Luanaigh and Lawlor, the estimate of heritability of individual differences in loneliness was 48%. Another study found higher levels of loneliness in individuals with lower levels of extraversion and higher levels of neuroticism.

This is not an exhaustive list - there will be other factors and groups of people for whom loneliness may also be an important issue, but with published evidence not always available. These would include young care-leavers, carers, refugees, those with mental health problems (Windle et al, 2011), homeless people, unemployed people, mothers with post-natal depression, people abusing drugs or alcohol and gay men and lesbians (Bolton 2012; Stonewall undated; Wirral Public Health Directorate, 2013).

2.Impact on health and wellbeing

The North West Mental Wellbeing Survey 2012-13 recognised the importance of loneliness and social isolation as a determinant of mental wellbeing (Jones et al, 2013).

Loneliness is a threat to health, with evidence that it is a significant risk factor for a wide range of mental and physical health problems, including depression, high blood pressure, sleep problems, reduced immunity and cognition in the elderly (O'Luanaigh and Lawlor 2008; Masi et al, 2011, Hawkley et al, 2010).

Several studies have shown an association between loneliness and depression (either as a cause or a consequence) (Meltzer et al, 2013, Victor and Yang, 2012) and high rates of mortality (Windle et al, 2011, Bennett, 2002). It has been reported that individuals with adequate social relationships have a 50% greater likelihood of survival compared to those with poor or insufficient social relationships. The influence of social relationships on risk for mortality is comparable with well-established risk factors for mortality. The magnitude of this effect is comparable with quitting smoking and it exceeds many well-known risk factors for mortality (e.g. obesity, physical inactivity) (Holt-Lunstad, 2010). A US analysis of the English Longitudinal Study of Ageing (ELSA) attempted to distinguish between the effects of social isolation and those of loneliness (Steptoe et al, 2013). The authors found that although both

isolation and loneliness impair quality of life and well-being, efforts to reduce isolation are likely to be more relevant to mortality.

There is mixed evidence on links between loneliness and suicide, with one review finding that loneliness can be predictive of suicide in older age (O'Connell et al 2004) and another review reporting that the association with suicide was weak (Hatcher et al, 2013). A US review presented evidence on the links between eating disorders and loneliness (Levine, 2012).

Being alone is not necessarily the same as being lonely – voluntary loneliness can be a positive thing and those who live alone can be seen as 'self-reliant problem solvers, respectful of other people's privacy' (Ellen, 2014). The ELSA study found that 2 in every 5 individuals who lived alone reported that they hardly ever or never felt lonely (Beaumont, 2013).

3.Interventions

3a. What are the effective interventions?

The Wirral Annual Public Health Report 2012-13 gives several descriptive examples of effective interventions to tackle social isolation (Wirral Public Health Directorate, 2013). The SCIE briefing (Windle et al 2011) give a comprehensive summary of the interventions available to tackle loneliness and social isolation, for older people and other population groups. These include one-to-one interventions, such as befriending, Community Navigators[1] and mentoring; and also social group schemes (e.g. art, discussion or writing groups); and wider community engagement.

There is evidence, although not always that strong, that all of these schemes can help to reduce loneliness and improve health and wellbeing (Windle 2011, Dickens et al, 2011, Masi et al, 2011). Evidence for one-to-one interventions is mixed, with Cattan et al (2005) and Findlay (2003) reporting that the effectiveness of home visiting and befriending schemes remains unclear. Pitkala (2009) reported that people who used Community Navigator services became less lonely and socially isolated following such contact.

Compared to 'usual care', Knapp et al (2010) found that befriending interventions and Community Navigator schemes were cost effective.

Overall, although there were some exceptions, it would appear that group interventions are more effective than one-to-one support (Windle et al 2011; Cattan et al, 2005).

It has been noted that interventions that treat chronic and long-term health conditions can lead to a decrease in loneliness (Victor and Bowling, 2012).

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[1] Community Navigators provide 'hard-to-reach' or vulnerable people with emotional, practical and social support. They are often volunteers (Windle et al, 2011)

Children and young people

Since the Windle review in 2011, a Cochrane review of social skills groups for people aged 6 to 21 with autism spectrum disorders (ASD) found some evidence suggesting decreases in loneliness (Reichow et al, 2013).

Shevlin et al (2013) noted that given the stability of loneliness from childhood to adolescence (see p.6, Rubin et al 2009), interventions for those aged under 18 (identified in Greco and Morris, 2001) may be most appropriately carried out at the primary school stage.

Internet and social media

It has been argued that the Internet and social media may be part of the cause of loneliness but also part of the solution (Robbins, 2014, Joseph Rowntree Foundation). A recent study found that Facebook use is only beneficial in terms of reducing peer-related loneliness over time if it is used with the intention of making new friends (Teppers et al, 2014). A small scale study (Fokkema et al 2007) and a review (Choi et al, 2012) reported that computer/internet usage helps to alleviate loneliness. The Policy Exchange has argued recently that loneliness among older people could be tackled by training more people to use the Internet, helping people to stay connected with friends and family (Policy Exchange, 2014).

Community capacity building and broad based interventions

The Marmot Review (2010) recognised the important role that social networks have in maintaining and improving health and wellbeing. Marmot recommended that locally developed and evidence based community regeneration programmes that reduce social isolation should be supported. The review by Knapp et al (2010) highlighted the importance of building community capacity to help to alleviate problems such as loneliness. In nursing practice, and especially health visiting, it is recognised that community building and attempts to tackle the effects of poverty and social deprivation can play an important part in tackling loneliness (Lauder et al 2006). Other broad, community level approaches to tackling loneliness would include developing transport policies that address social exclusion (Stanley and Lucas, 2008) and promoting intergenerational activities (Poole and Gooding, 1993), such as reading groups in libraries and community centres (The Reader Organisations, online). There is a lack of evidence for the effects on loneliness of such broader-based 'upstream' initiatives. It is important that such interventions are considered when tackling loneliness and that they include an evaluation component relating to loneliness in future.

3b. Do loneliness interventions improve health?

The review by Windle et al (2011) cites several studies demonstrating how mitigating loneliness will improve quality of life. It may also lead to reduced health and social care costs. A systematic review on the effectiveness of befriending found that it had a modest but significant effect on depressive symptoms in the short and long term when compared with usual care or no treatment (Mead et al, 2010). However, the quality of some of the trials was a cause for concern. Windle et al (2011) noted that outcomes from mentoring services are

not clear, with one study involving people aged 65 plus reporting improvements in mental and physical health (Greaves and Farbus, 2006) and a review on interventions for older people finding no difference (Dickens et al, 2011).

Group initiatives tackling loneliness can also improve health and wellbeing, as reported in the review by Windle et al (2011). For example significant improvements in subjective health were reported by those taking part in social group activities in a study by Pitkala et al (2009). There were improvements in physical health reported by members of a community choir (Cohen et al, 2006).

A more recent study by Bekhet et al (2012) concluded that intervention programs designed to prevent or reduce loneliness in older adults may be beneficial for preserving their mental health.

The studies by Pitkala et al (2009) and Cohen et al (2006) gave details of how group based loneliness interventions also resulted in reduced health service use.

Table 1 at the end of this review gives a summary of individual studies, with details of the type of intervention and the population group covered. The systematic reviews often included a mix of studies reporting on interventions both to prevent or to alleviate loneliness. Interventions were usually targeted at the population groups most likely to experience loneliness, in particular the elderly, rather than people identified as being lonely. For example in the review by Dickens et al (2011) less than half of the 32 studies involved interventions targeted at people who had been assessed as lonely.

Discussion/recommendations

The quality of studies considered in this review was variable. Prevalence estimates came from good quality UK studies, backed up with similar estimates found in other studies. The evidence on effective interventions was not always that strong and the quality of studies varied, with further research recommended. Therefore the degree of success of loneliness interventions has been reported with caution. So far, it has only been possible to confirm that interventions are likely to have only a moderate effect in reducing loneliness. It is important not to let the lack of evidence prevent action in these areas. The following steps are recommended:

Recommendations

1. Introduce interventions to prevent and alleviate loneliness, especially social group schemes, but also one-to-one interventions such as befriending, Community Navigators and mentoring.

2. In addition to interventions involving older people, consider targeting interventions at other vulnerable groups, such as children and young people, especially those with autism spectrum disorder.

3.	Consider the limited evidence base on the effectiveness of loneliness interventions, especially for those involving children and younger adults, and include an evaluation component in proposals for local interventions.

4.	Ensure that tackling loneliness is a consideration in broader policy areas such as transport policy and initiatives that promote wider community engagement and capacity building, and include an evaluation of the impacts on loneliness of these policies.

5.	Encourage Health & Wellbeing Boards to take overall responsibility, ensuring that the recommended actions to address social isolation contained within separate local strategies (e.g. a carers strategy) are joined up where it is sensible and practical to do so (adapted from recommendation 5 in Wirral report [Wirral Public Health Directorate, 2013]).

Table 1: Summary of studies included in the review:

Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
1. Prevalence			
Victor and Bowling 2012. UK. Longitudinal study	Older people (65+)	9% of those aged 65+ reported severe loneliness; 30% reported that they were sometimes lonely, and 61% reported that they were never lonely.	
Beaumont 2013. England. ONS wellbeing survey	Older people (52+)	Presents detailed prevalence data on loneliness by age, sex and other characteristics (some details in text).	
Pinquart 2001. US. Meta analysis	Older people	5% to 15% of seniors over 65 report frequently feeling lonely About 50% of adults aged 80 and above often feel lonely.	
O´Luanaigh 2008. Ireland. Review	Older people	Amongst those aged 65 and over, between 5% and 16% report loneliness. There is evidence that hereditary factors and certain personality types predispose to loneliness.	
Victor and Yang 2012. UK. European Social Survey data	Adults aged 15+	Overall loneliness levels were 6% (severe: lonely all or most of the time). Levels were high (9%) for those aged under 25 years and those aged 55 years and over. Significant relationship between loneliness and gender: 9% of women and 6% of men reported that they were lonely most or all of the time, with a further 25% and 22% respectively reporting that they were sometimes lonely.	

Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
Masi 2011. US. Meta-analysis of loneliness interventions. 50 studies included	All age groups	Found significant levels of loneliness amongst children and adults (see some details in the text above).	Some of the studies are quite old, and each will use different definitions of loneliness, however they do give an indication that loneliness is a significant problem across all age groups.
Meltzer 2013. UK. Cross sectional national survey	Adults	Feelings of loneliness were more prevalent in women as well as in those who were single, widowed, divorced or separated, economically inactive, living in rented accommodation or in debt. Loneliness was associated with all mental disorders, especially depression.	
Hawkley and Caccioppo 2010. US. Review	All ages	A review of the features and consequences of loneliness.	
Berguno 2004 UK study- qualitative interviews	Children 8-10 years	80% of children aged 8-10 reported being lonely at least sometimes.	
Shevlin 2013. N.Ireland. Survey	Adolescents aged 16	The prevalence of loneliness amongst those aged 16 was 15.6%.	
NSPCC 2010. UK. Study	Children	In 4% of calls, being lonely, sad or isolated was the main problem. Includes details on gender and related factors.	
Rubin 2009 Canada. Review	Under 18	Many children who withdraw from their peers do so consistently across time and context.	
Victor, Burholt 2012. UK. Exploratory study (survey plus secondary analysis of study data)	Ethnic minority, aged 65+	Very high rates of reported loneliness identified, ranging from 24% to 50% (with the exception of the Indian population, which was similar to the 8-10% for Britain).	
Alma 2011. Netherlands., Cross-sectional study	Elderly visually impaired	The prevalence of loneliness among the visually impaired elderly was higher compared with normally sighted elderly (50% vs. 29%; p < .001). Self-management training may reduce feelings of loneliness.	
Pronk 2011. Netherlands. Analysis of Dutch	Elderly with hearing problems	Found significant adverse effects of poor hearing on emotional and social loneliness for specific subgroups of older persons, especially non-hearing aid users and men.	

Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
Longitudinal Ageing Study data			
Bossaert 2012 Belgium. Experimental study	Students age 13-14 with special educational needs in mainstream school	Students with ASD in mainstream school reported more loneliness than typically developing students and students with motor and/or sensory disabilities. Loneliness prevalence for typically developing students and students with motor and/or sensory disabilities did not differ significantly.	
Lasgaard 2010. Denmark. Cross-sectional study	Boys aged 13-17 in two special education schools	21% of the boys with ASD described themselves as often or always feeling lonely, compared with 4% of the controls. ASD was strongly associated with often or always feeling lonely (**OR:** 7.08, p < .0005), as well as with a higher degree of loneliness. Perceived social support as an important protective factor.	Loneliness was self-reported and so may be under-estimated. Studied those in special schools so may not be representative of all those with autism.
2. Impact on health and wellbeing			
Windle 2011. UK. SCI research briefing	All ages	Social isolation and loneliness impact upon individuals' quality of life and wellbeing, adversely affecting health and increasing their use of health and social care services.	
Masi 2011. (also see in '1. Prevalence' above). US. Meta-analysis of loneliness interventions. 50 studies included.	All age groups covered, but of the 50 studies, only 5 were studies of children, and 18 of adults under 60.	Included a review of the literature on the health effects of loneliness which found that, whilst painful in its own right, loneliness is a significant risk factor for a myriad of mental and physical health problems (p.220). These included increased vascular resistance in young adults; high blood pressure in older adults; sleep problems; diminished immunity; cognitive decline and progression of Alzheimer's disease. Those socially isolated as children are more likely to have risk factors for cardiovascular disease (including overweight, high BP and high cholesterol). Loneliness can also predict depressive symptoms and suicide.	Author's comment: limitations included a lack of consideration of non- English language studies and due to availability of studies, a focus on interventions involving older people.
Victor and Yang 2012. UK. European Social Survey data	Adults aged 15+	Depression is associated with loneliness for all age groups. Poor physical health is associated with loneliness in young adult and midlife but not later life.	
Hawkley, Thisted 2010. US. 5-Year Cross-Lagged Analyses	Ages 50- 68	Loneliness was found to predict increased blood pressure, with an effect independent of age, gender, race or ethnicity, cardiovascular risk factors, medications, health conditions, and the effects of depressive symptoms, social support and perceived stress.	

Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
OʹLuanaigh 2008. Ireland. Review.	Older people	Loneliness has strong associations with depression and may in fact be an independent risk factor for depression. Furthermore loneliness appears to have a significant impact on physical health being linked detrimentally to higher blood pressure, worse sleep, immune stress responses and worse cognition over time in the elderly.	
Holt-Lunstad 2010. UK. Meta-analysis of 148 studies	Older people (ave age 64)	People with stronger social relationships had a 50% increased likelihood of survival than those with weaker social relationships.	
Meltzer 2013 UK cross sectional national survey	Adults	Loneliness was associated with all mental disorders, especially depression.	
Bennett 2002. UK. Case control study	Older people	Levels of social engagement either have a direct effect on mortality, or represent hidden health problems, acting as a marker for later ill health.	
O'Connell 2004. Ireland. Clinical review.	Older people	Loneliness and low social interaction are predictive of suicide in older age.	
Hatcher 2013. Canada. Systematic review	All ages	'Low sense of belonging' has a weak association with suicide.	Concepts/definitions need clarifying
Levine 2012. US. Systematic review	Those with eating disorders	Loneliness contributes to and fuels eating disorder symptoms. Understanding this relationship is vital.	

3. Interventions

3a. Effectiveness of loneliness interventions
Green = effective
Amber = likely to be effective (caution may be due to limitations of the study)

i. reviews of studies comparing interventions

Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
Windle 2011. UK. SCI research briefing	All ages	People who use **befriending or Community Navigator services** reported that they were less lonely and socially isolated following the intervention. Outcomes from **mentoring services** are less clear. **Group interventions** appear the most effective.	
Dickens 2011. UK. Systematic review of 32 studies	Older people	Interventions targeting social isolation in older people can be more effective in alleviating isolation and loneliness if they have a theoretical basis, offer **social activity and/or support within a group, or involve people as**	CRD*: 'Given the poor conduct and reporting of the included studies and some limitations in

Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
		active participants.	the synthesis, the reliability of these conclusions is unclear'.
Cattan 2005. UK. Systematic review of 30 studies, including 16 RCTs and 10 non-randomised controlled trials	Older people (age range 38-93 years, majority 65+)	Educational and social activity **group interventions that target** specific groups of people can alleviate social isolation and loneliness among older people. The effectiveness of **home visiting** and **befriending** schemes remains unclear.	CRD*: 'well conducted systematic review, with conclusions likely to be reliable'
Findlay 2003. Aus. Systematic review of 17 studies	Older people	Findlay's findings were replicated by Cattan et al (2005, see above): i.e. closed self-help or support groups are effective in reducing loneliness and social isolation. Some evidence that overall, **group interventions** are more effective than **one-to-one** support – although there were exceptions in some studies (Windle, 2011).	Author's comment: 'There is very little strong evidence to show that social isolation intervention programmes work. Future programmes should have evaluation built into them at the start'.
Masi et al, 2011 (also above). US. Meta-analysis of loneliness interventions. 50 studies included.	All age groups covered	'interventions aimed at **changing maladaptive social cognitions** were **effective in reducing loneliness**' (from Shevlin et al 2013).	Although interventions were effective, 'there is no clear prototypic lonely adolescent for whom interventions could be directed' (Shevlin et al 2013)
Greco 2001. US. Review	Ages 18 and under	Interventions based on **social skills training, peer-pairing and cognitive behavioural principles** have all been shown to be effective in promoting positive social interactions in the short term.	Authors noted a lack of evidence in long term gains of such programmes
Stanley 2008. Australia and UK. Workshop report.	All ages	Reported on a workshop giving examples of transport service systems designed to address social exclusion.	Authors: Gaps were highlighted, particularly in evaluation and cost-benefit analysis.
ii. studies and reviews focussing on one intervention type			
Pitkala 2009. Finland. RCT.	Older people	It may be possible to reverse the deteriorating effects of social isolation, reducing health care costs and mortality while increasing participant health by using the study's **psychosocial group rehabilitation programme in lonely older persons.**	CRD*: 'The study was generally well conducted and the authors' conclusions appear appropriate'.

Study (1st author, date, country and study type)	Population group	Main findings		Critique of evidence
Knapp 2010. UK. Discussion paper	All ages	Compared to 'usual care', **befriending interventions and Community Navigator schemes** were cost effective.		
Reichow 2013. US. Cochrane review	Young people aged 6 to 21 with autism spectrum disorders (ASD)	**Social skills groups for young people with ASD** : results of single studies suggested decreases in loneliness.		
Victor and Bowling 2012. UK. Longitudinal study	Older people (65+)	Results suggest that in addition to **social interventions, the treatment of chronic and long-term health conditions** can lead to reductions in loneliness.		
Teppers 2014. Belgium. Cross-lagged analysis based on data from 256 adolescents	Adolescents aged 15-17 years	Facebook use for making new friends reduced peer-related loneliness over time, whereas Facebook use for social skills compensation increased peer-related loneliness over time		
Fokkema 2007. NL. Controlled experiment. Internet-at-home intervention, with computer and follow-up internet training to 12 older people	Older people (ave. age 66)	**Internet intervention** was found to help alleviate loneliness. E-mail was found to facilitate social contact. The computer was often used to pass the time, 'taking people's minds off their loneliness'.	The authors stated: 'We cannot conclude that the reduction in loneliness observed among the participants could be attributed to the intervention'. Windle (2011) stated that small samples and inadequate matching of comparison or control groups led to unreliable outcomes.	
Choi 2012. USA/Israel/ Netherlands. Review, 6 studies included	Older people	There was a statistically significant reduction in loneliness in older adults as a result of **computer and internet training**, compared with controls.		CRD*: 'questions of generalisability, poor quality studies and small sample sizes may affect the reliability of the conclusions'.
3b. Effect of loneliness interventions on health and wellbeing (HWB) Green = positive effect on HWB Amber = likely positive effect on HWB (caution may be due to limitations of the study)				
Windle 2011. UK. SCI research briefing	All ages	Reviewed several studies that show how mitigating loneliness will improve quality of life (p.3, 1st column, Windle 2011) and increase chances of survival (p.6, 1st column).		

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Study (1st author, date, country and study type)	Population group	Main findings	Critique of evidence
Greaves 2006. UK. Study	Older people (65+)	A complex intervention, embodying the principles that social isolation interventions which **promote active social contact, which encourage creativity, and which use mentoring**, are more likely to positively affect health and well-being. Found that the model provided a practical way of engaging socially isolated elderly people and generating social networks, with a range of psychosocial and physical health benefits.	Authors: Although there are limitations in attributing causality in uncontrolled studies, the data seem to indicate a reversal of the expected downward trends in some aspects of participants' health.
Dickens 2011. UK. Systematic review of 32 studies	Older people	There are indications that **social isolation interventions** may have wide-ranging benefits including alleviating loneliness, and improving mental and physical health.	CRD*: 'Given the poor conduct and reporting of the included studies and some limitations in the synthesis, the reliability of these conclusions is unclear'.
Bekhet 2012. US. Secondary analysis	Older people (65+)	**Intervention programs designed to prevent or reduce loneliness in older adults** may be beneficial for preserving their mental health. Such programmes include teaching coping strategies and cognitive therapy.	
Mead 2010. UK. Systematic review (24 RCTs)	Ages 14+	**Befriending** had a modest effect on depressive symptoms and emotional distress in varied patient groups.	CRD*: The review was well conducted. The authors conclusions were cautious, as they recognised that the quality of the included trials was a cause for concern.
Pitkala 2009. Finland. RCT	Older people	**Psychosocial group rehabilitation** was associated with lower mortality and less use of health services. The intervention group showed a significant improvement in subjective health, thus resulting in significantly lower health care costs during the follow-up: the difference between the groups was −943 €/person per y (95% CI −1955 to −127; p = .039.	CRD*: 'The study was generally well conducted and the authors conclusions appear appropriate'.
Cohen 2006. US. Study of a community based choral programme	Older people	The **intervention group (i.e. a choral group)** reported a higher overall rating of physical health, fewer doctor visits, less medication use, fewer instances of falls, and fewer other health problems than the comparison group. The intervention group also evidenced better morale and less loneliness.	

*CRD = NIHR Centre for Reviews and Dissemination. CRD database

(NHS National Institute for Health Research, Centre for Reviews and Dissemination, University of York).

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Appendix

Search results

The Appendix table below gives details of searches made. All searches were for articles from year 2000 to current, unless stated otherwise. Searches were carried out during the last two weeks of June 2014. For the medline search, as searching for 'loneliness' on its own resulted in 1,635 hits, searches were refined using combinations of search terms and all were restricted to 'English language' and 'humans'. Further studies were identified through snowballing, especially from the review by Windle et al (2011).

Appendix table: Search details

Database	Search terms	Hits	Included	Excluded
NIHR Centre for Reviews and Dissemination. CRD database (NHS National Institute for Health Research, Centre for Reviews and Dissemination, University of York). http://www.crd.york.ac.uk/CRDWeb/	Loneliness (all fields)	15	10	5
Medline	Loneliness + systematic review (ti + abstract)	12	3	9
	Loneliness + prevalence (ti + abstract)	158	26	132
	Loneliness + intervention (ti + abstract) 2011 to current. *(There were 270 hits from 2000, so the search was restricted to articles from 2011 - i.e. since the comprehensive Windle et al review in 2011)*	64	17	47
NICE guidance http://www.nice.org.uk/Guidance	Loneliness (all fields)	10	1	9
	(some of the 9 were repeat hits and others appeared to only briefly mention loneliness. If there had been time, some of these hits could have been explored further)			

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