Promoting social capital to alleviate loneliness and improve health among older people in Spain

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Abstract
Loneliness is especially frequent among older people in Southern Europe. Furthermore, promoting social capital to tackle loneliness and its health effects is an understudied intervention strategy. Therefore, a complex intervention was piloted in Spain in a pre-post study with a 2-year follow-up. Its aims were to explore the feasibility of the intervention and its short- and long-term effects. It was conducted in one mixed rural—urban and two urban areas of diverse socioeconomic levels from 2011 to 2012. The intervention framework was based on social capital theory applying a behaviour change model and care co-ordination. The intervention comprised: (i) a co-ordinated action aimed at building a network between primary healthcare centres and community assets in the neighbourhood and (ii) a group-based programme, which promoted social capital among lonely older people, especially social support and participation. Older people active in senior centres volunteered as gatekeepers. The main outcome domain was loneliness. Secondary outcome domains were participation, social support, self-perceived health, quality of life, depressive symptoms and use of health resources. Pre-post changes were assessed with t-test, Wilcoxon signed-rank test and McNemar’s test. Differences between the three time points were assessed with a one-way ANOVA with repeated measures. Social workers and nurses were successfully involved as group leaders, 10 volunteers took part and 38 participants were included. After the intervention, loneliness decreased while social participation and support significantly increased. Furthermore, the number of visits to nurses increased. Exactly 65.8% of the participants built social contacts within the group and 47.4% became engaged in new activities. Two years later, social effects were maintained and depressive symptoms had decreased. Exactly 44.7% of the participants continued to be in contact with at least one person from the group and 39.5% continued participating. The intervention contributes a novel and feasible social capital-based approach for alleviating loneliness among older adults while prompting meaningful changes in their lives.

Keywords: aged, psychosocial intervention, loneliness, social capital, social participation, social support
Background

The need to alleviate loneliness

Loneliness is a negative feeling that occurs when a person’s social needs do not correspond, either in quantity or in quality, to their actual social relationships (Peplau & Perlman 1982).

Loneliness increases with age. Thus, the current ageing trend entails a higher number of older people suffering from loneliness. However, the nation in which one lives has a greater impact than age on loneliness (Yang & Victor 2011). Longitudinal studies on loneliness are limited to specific regions in Nordic countries and use different measurements. Therefore, repeated European cross-sectional surveys such as the SHARE study provide reliable cross-national comparative data. According to this study, the prevalence of loneliness (i.e. feeling lonely all or most of the time) among people over 65 varies in Europe from 4% in Switzerland to 20% in Greece, with Spain at 14% (Sundström et al. 2009). This confirms a north–south gradient, with loneliness being higher in southern countries, contrary to that generally assumed. This gradient appears to be related to poorer social integration and participation and higher expectations of family members in southern countries compared to Northern European countries (van Tilburg et al. 1998, Dykstra 2009, Litwin 2010). Moreover, a high proportion of older people and women, unfavourable socioeconomic circumstances and poor health in southern countries such as Spain also contribute to the higher prevalence (Victor et al. 2005, Fokkema et al. 2012). However, there is a lack of intervention studies on loneliness in Mediterranean countries, which apply a country-tailored approach.

Furthermore, although differences in loneliness between urban and rural areas seem to disappear when taking gender, income and education into account (Routasalo et al. 2006), the relevance of geographical contexts when intervening in loneliness is understudied.

Loneliness and health are clearly inter-related. Well-established risk factors for loneliness are poor self-assessed health, depression, functional dependence, low self-efficacy, reduced social network and recent bereavement (Fry & Debats 2002, Victor et al. 2005, Cattan et al. 2011, Prieto-Flores et al. 2011). At the same time, loneliness is a known risk factor for health outcomes such as depression, dementia and mortality (Hawkley & Cacioppo 2010, Tilvis et al. 2011). Moreover, loneliness is associated with an increased use of health services (Ellaway et al. 1999, Geller et al. 1999).

Systematic reviews on loneliness interventions targeting older people have found that the most effective aspects are the following: being group-based and theory-driven, with educational input or supportive activities; targeting specific groups of older adults, including training and support for group facilitators; encouraging older adults’ participation in decision-making; involving community resources; and building community capacity (Findlay 2003, Cattan et al. 2005, Dickens et al. 2011). However, according to systematic reviews and latest trials, loneliness interventions seldom include physical and mental health outcomes. Studies that do so used heterogeneous health measures and yield both positive and negative results (Pitkala et al. 2009, 2011, Dickens et al. 2011). Thus, the health effects of loneliness interventions are to date promising but inconclusive.

The role of social capital to alleviate loneliness

Recently, the concept of social capital has become prominent in public health research. This interest widens the focus from the individual level to socio-environmental factors at neighbourhood and community levels. Likewise, the Active Ageing paradigm highlights the importance of contextual factors such as social resources in the ageing process and encourages the fostering of social networks for ageing people (World Health Organization 2002).

Social resources, such as social capital, have been linked to the absence of loneliness among the general population (Islam et al. 2006, Kim et al. 2008) as well as among older people (Routasalo et al. 2006, Nyqvist et al. 2013a).

Several definitions of social capital have been proposed (Moore et al. 2006) but two main conceptualisations prevail. While the social cohesion approach refers to social capital as a public good based on community activities (Weil & Putnam 1994), the social network approach understands that social networks have different values for different individuals (Coleman 1988). From an ageing perspective, Putman’s definition of social capital, which is the most popular in health research, has been problematised and adapted to older age (Nyqvist & Forsman 2015). During ageing, health and functional ability deteriorate, limiting the ways in which older people participate and engage in community life. Therefore, Nyqvist et al. (2013a) proposed placing more relevance on the interaction between individuals at the micro level. According to them, social capital is an umbrella concept that involves individual (family and friends) and collective social resources (e.g. neighbourhoods), their structural (e.g. social networks,
social contacts and participation) and cognitive aspects (e.g. social support and sense of belonging) (Forsman et al. 2011; Nyqvist et al. 2013c). Moreover, according to the directions of social ties, social capital is defined as bonding, bridging or linking.

It should be highlighted that social capital as a whole and its different components have protective health effects (Hawe & Shiell 2000, Ertel et al. 2009, Holt-Lunstad et al. 2010, Holmes & Joseph 2011, Eisele et al. 2012; Rocco & Suhrcke 2012, Nyqvist et al. 2013b,c, Andrew & Keefe 2014). Among older adults, social capital is related to better mental well-being and increased self-perceived health (Schultz et al. 2008; Nyqvist et al. 2013b). Furthermore, social capital appears to be a mediator between social determinants and negative health outcomes (Kawachi et al. 1999, Bøen et al. 2012).

In particular, two components of social capital are crucial to tackle loneliness among older people: social support as a cognitive resource and social participation as a structural one (Routasalo et al. 2006, Savikko et al. 2010, Litwin & Shiovitz-Ezra 2011, Stephens et al. 2011, Nyqvist et al. 2013a). Indeed, a recent meta-analysis on loneliness interventions across the lifespan identified and proved effective four intervention strategies: improving social skills, enhancing social support, increasing opportunities for social interaction and social cognitive training (Masi et al. 2011). However, in trials targeting older people, increasing social support was the most widely applied strategy and the only effective one. Furthermore, interventions rarely tried to increase opportunities for social interaction and none applied more than one strategy (Masi et al. 2011).

Social participation, defined as social engagement, interacting or doing activities with others, entails behavioural challenges (Levasseur et al. 2010). Thus, to successfully increase social participation, professionals must foster a behaviour change towards a more active lifestyle. The most commonly applied theory to promote healthier lifestyles is the social cognitive theory, focused on intra- and interpersonal processes (Bandura 1977). Additionally, social ecological models provide a comprehensive framework which accounts for the organisational, community and public policy influences (Bronfenbrenner 1994, Stokols 1996, Michie et al. 2011).

At present, in primary healthcare, loneliness is not addressed as a health-related condition. Nevertheless, current health and social care policies advocate care co-ordination, i.e. inter-professional working between health and social care professionals to respond to the complex and multiple needs of older people. This proves to be a promising approach to address loneliness (Dowling et al. 2004, Øvretveit 2011, Petch et al. 2013, Van Orden et al. 2013, Ledesma 2014).

In summary, social capital theory could drive empirical research to target loneliness and its complex link with health (Nummela et al. 2009, Hunter et al. 2011, Taube et al. 2015).

Therefore, a complex intervention was designed to alleviate loneliness among community-dwelling older people in primary care by promoting social capital in their social environment.

**Aims**

The first aim was to explore the feasibility of the intervention in mixed rural–urban and urban areas of diverse socioeconomic levels.

The second aim was to assess the immediate and long-term effects of this intervention among older participants on: (i) loneliness; (ii) structural and cognitive aspects of individual social capital (i.e. participation and social support); (iii) perceived health, health-related quality of life, depressive symptoms and the use of anxiolytics and antidepressants; and (iv) the use of health services.

**Methods**

**Study design**

This was a multi-centred and non-controlled exploratory complex intervention study with a pre–post design, based on a community and psychosocial intervention with a 2-year follow-up. It was conceived as a first step prior to a definitive trial. Quantitative and qualitative methodologies were applied with a complementary purpose. The goal of this article is to present the quantitative results.

**Study population**

Three primary healthcare centres in two municipalities in Catalonia (Spain) were selected by convenience to implement the intervention in a mixed rural–urban context with a medium socioeconomic level (zone A) and an urban context with a low and medium socioeconomic level (zones B and C respectively). The mixed rural–urban area had 16,000 inhabitants, while the urban area had 1,600,000.

The participants’ recruitment strategy for the group-based programme was pragmatic. Professionals could refer patients by contacting them actively or by asking their patients about loneliness during routine visits. All professionals, i.e. general practitioners, nurses and social workers, were encouraged to use
the programme as an opportunity to refer patients suffering from loneliness, as they usually refer patients to specialists or specific interventions. Participants were also self-referred through advertising in the centres. A nurse ensured that those who volunteered to participate met the following eligibility criteria: (i) community-dwelling aged ≥60; (ii) feels lonely ‘sometimes, often or always’ in response to the question ‘Do you feel lonely?; (iii) can walk to the centre independently; (iv) no cognitive decline; (vi) able to participate in a group dynamic; and (vii) does not participate in regular social activities.

**Intervention**

The intervention consisted of a co-ordinated action and a group-based programme. The co-ordinated action was aimed at building and strengthening the network between primary healthcare centres, senior centres and other community assets in the neighbourhood where older people could participate in activities. Moreover, older people active in local senior centres were recruited and trained as volunteers. Their goal as gatekeepers was to introduce lonely older people from the programme to community assets. The group-based programme was conducted from January to June 2012 applying an intervention guide (Coll-Planas & Gómez 2012). The group met for 1.5 hours a week for 15 weeks. Figure 1 shows the actions comprised in both the intervention components.

The overall intervention framework was based on the social cohesion approach of social capital theory emphasising the interaction between the older persons and their social environment (Weil & Putnam 1994). Specifically, the social capital operationalisation from Nyqvist was used to develop a new complex loneliness intervention considering the structural, cognitive, bonding, bridging and linking elements related to loneliness at individual and neighbourhood levels (Nyqvist & Forsman 2015). The study assumes that social capital is acquired through involvement in

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**Actions at neighbourhood level**

Creating a network between primary healthcare centres, senior centres and other community assets in the neighbourhood

- Raising awareness of loneliness among primary care professionals in an interdisciplinary clinical session in the three primary care centres.
- Identifying primary care professionals as potential leaders for the group-based programme. selecting two of them per centre and training them.
- Raising awareness on loneliness in three local senior centres.
- Selecting and training older people from senior centres to be volunteers as gatekeepers to community assets.
- Building an integrated team with primary care professionals, volunteers and researchers to map local community assets and to design, conduct and evaluate the programme.

**Sessions content of the programme**

**Session 1:** participants share their feelings of loneliness and discuss the advantages of being alone.

**Session 2:** participants discuss the advantages of social participation.

**Session 3:** volunteers present local community assets and the group decides on five that they would like to visit.

**Session 4, 6, 8, 10 and 12:** visits to community assets organised by volunteers with support from researchers. The visit includes: visiting the centre, getting to know the activity programme, engaging in an open activity whenever possible. Volunteers accompany participants in the visits without the presence of primary care professionals.

**Sessions 5, 7, 9, 11 and 13:** sessions in the primary care centre are alternated with the five visits. During the first part participants comment on the previous visit and prepare for the following one with the volunteers. During the second part, participants create a mural that represents their experiences in pictures and words.

**Sessions 14 and 15:** these sessions are aimed at bringing the project to a close and giving support to the group in deciding whether and how to continue their gatherings.
social activities and that structural and cognitive aspects of social capital (i.e. social participation and social support) reinforce each other. Moreover, strategies based on a behaviour change model and care co-ordination were integrated. Specifically, the programme was initially theory-driven based on the social cognitive theory, complemented by the socio-ecological model, from an empowerment perspective (Bandura 1977, Lord & Hutchison 1993, Michie et al. 2008, Braungart 2011). The model for our group-based programme was designed considering previous effective models (Pitkala et al. 2009, Savikko et al. 2010) (see Figure 2). It was further developed with a practical orientation by professionals from the centres.

Measurements and data collection techniques

Using a semi-structured questionnaire, the professionals involved were asked about their background and experience in conducting groups. Likewise, volunteers were asked about socio-demographic data, their trajectory of volunteering and their motivation for getting involved in the project.

Participant socio-demographic data, chronic morbidity and prescribed medication were recorded for descriptive purposes. Impact evaluation comprised the baseline and follow-up assessment, which consisted of validated interviewer-administered questionnaires regarding psychosocial aspects and health status.

Figure 2 Model of the group-based programme. Elements identified as crucial were predetermined such as characteristics of participants, professionals and volunteers, group activities and group features. Social capital-related goals of the programme were defined. Mediating factors were proposed to achieve the goal of alleviating loneliness by increasing social capital and, consequently, ameliorate health. The intervention model was adapted from Pitkala et al. (2009) and Savikko et al. (2010).
Loneliness intensity was the primary outcome domain assessed by the 11-item De Jong Gierveld Loneliness Scale (De Jong Gierveld & Van Tilburg 2010). The frequency of loneliness was assessed with a single-item self-rating scale. The impact on social support, as a cognitive aspect of individual social capital, was assessed using the Social Resources Inventory in Older Adults (Veiga 1987). Likewise, the impact on social participation, as a structural aspect of individual social capital, was assessed using the Subjective Social Participation Index (Rubio et al. 2009). Further outcome measures were: self-perceived health and health-related quality of life [12-Item Short-Form Health Survey (SF-12)] (Ware et al. 1996), depressive symptomatology (Geriatric Depression Scale-5) (Valle et al. 2001), and current use of anxiolytics and antidepressants. The use of health services was retrieved from computerised medical records and included consultations with a general practitioner, visits to nurses and social workers in primary care, visits to the emergency department and hospital admissions 12 months prior to the programme, just after it and 6 months later. Participants were also asked about the number of social contacts established within the group, and the number and type of new activities in which they had become regularly engaged.

Two years after finishing the intervention, long-term effects were assessed through telephone interviews, employing the same questionnaire. In addition, using a semi-structured questionnaire, participants were asked about the number of social contacts maintained within the group and how they had stayed in contact, the number and type of activities in which they continued to be engaged and why they had continued them.

The study protocol followed the principles of the Declaration of Helsinki (World Medical Association). The ethics committees from UAB and IDIAP approved the protocol. Participants gave their informed consent.

Statistical analysis

According to the recommendations for exploratory studies, a sample of 20–25 was estimated as adequate (Hertzog 2008). Considering the goal of piloting the intervention in three different areas, three groups were planned. Accounting for a dropout rate of 20%, the estimated initial recruitment was 15 persons per group to achieve a final sample of 36 participants, 12 per group.

To assess pre-post changes, the totality of participants was compared before and after the intervention regarding the impact indicators. Ordinal and numeric variables with a normal distribution (Kolmogorov–Smirnov test with $P \geq 0.05$) were analysed with a $t$-test to compare the means in paired samples (repeated measures). In variables without a normal distribution, the Wilcoxon signed-rank test was applied. String variables were assessed using McNemar’s test. A one-way ANOVA with repeated measures was applied to assess differences between baseline, after the intervention and 2 years later. The level of significance was 0.05. Analyses were performed with the statistical programme IBM SPSS Statistics® 21.

Results

Health and social care professionals were successfully identified; all were women. Specific adaptations had to be made locally. In zone A, the group facilitator was a social worker experienced in groups, and the observer was a primary healthcare nurse. In zone B, two primary healthcare social workers were involved. In zone C, a nurse facilitated the group while a social worker observed.

After the fruitful presentations conducted in each local senior centre, overall, 19 older people wished to participate and of these, 10 became volunteers. The reason for rejection was time availability. Zone A had four volunteers, while zones B and C each had three. The volunteers ranged in age from 67 to 82, and nine were women. They had two different profiles: the younger profile had recently retired and started becoming involved in senior centres, while the older profile had a long trajectory of such engagement. All volunteers reported being motivated to help lonely older people in their neighbourhood by introducing them to the community assets.

In the three zones, the professionals favourably endorsed the group-based programme and had applied the intervention guide smoothly. Three groups were successfully created with a total of 38 persons. The group in zone A began with 11 participants, zone B with 16 and zone C with 11. Further baseline characteristics are shown in Table 1. The flow chart of participants is shown in Figure 3.

Of the 38 participants, 68% ($n = 26$) completed the programme (8 in zone A, 12 in zone B and 6 in zone C). Six persons discontinued the intervention due to health problems, i.e. depression ($n = 2$), hearing impairment, mobility problems, falling and initial cognitive decline. Three persons withdrew due to programme-related reasons: in one case, the group purpose differed from that expected (a recently widowed man looking for a new partner), one person felt uncomfortable, and the third case was a woman from the mixed rural–urban zone who did not wish to
share her feelings in a place where people might know her and the people she would mention. Moreover, one person discontinued for family reasons, one died and one left for unknown reasons. Throughout the intervention and the follow-up, three participants died, one per group. The causes were independent of the study.

Each group conducted five visits to local community assets. The following community assets were visited: seven senior centres, four libraries, one neighbourhood association, one museum, one community centre and one cultural centre. During the visits, participants engaged in 11 activities: three storytelling sessions, two regular informal gatherings, one workshop on handicraft, one film, one literature awards ceremony, two time-banking presentations and one conference on health.

Table 1 shows the main pre–post results on impact indicators. Positive effects were found on loneliness, social support and participation. Concerning immediate health impacts, other than an increase in visits to nurses, no significant impact was found on health-related quality of life, either on the physical or the mental component of the SF-12. No significant change was seen in visits to the emergency department or in hospitalisation (results not shown).

The long-term impact evaluation showed that loneliness had reduced significantly (mean: 0.46, SD: 0.93, $P < 0.001$), as had emotional (mean: 0.21, SD: 0.66, $P < 0.001$) and social loneliness (mean: 0.25, SD: 0.53, $P < 0.001$). Social participation had significantly increased (mean: 2.04, SD: 1.94, $P < 0.001$), whereas depressive symptoms had significantly decreased (mean: 1.17, SD: 1.15, $P = 0.032$). However, self-rated health did not show significant changes (mean: 3.83, SD: 0.92, $P = 0.33$).

Of the 26 participants who finished the programme, 25 remained in contact with at least one person from the group, and 18 were engaged in activities. Of all the initial participants, 65.8% had built social contacts within the group, and 44.7% maintained contact with at least one person 2 years later. It is noteworthy that 17 participants had contact with three or more people. The mean number of contacts reduced from 3.4 (SD: 2.1) just after the intervention to 2.3 (SD: 1.9) at follow-up. 47.4% of the participants engaged in new activities just after the intervention, and 39.5% continued participating 2 years later.

Two years after the intervention, participants reported diverse forms of continuing their contacts. In zone A, the main bonding elements between participants were activities promoted by the Social Services, in which they were mainly involved as volunteers. In zone B, volunteers were the bonding element: after some informal gatherings, they established a formal memory training activity. In zone C, participants were mainly connected through the senior centre.

Participants reported that they continued the activities because they experienced satisfaction and well-being, their needs were being met (e.g. memory training eased their concern of losing their memory), they were participating with a friend, and they had established and maintained social contacts.
Discussion

This study provides a novel approach to address loneliness by means of promoting social capital.

Feasibility of the intervention

The co-ordinated action was feasible, and professionals and volunteers were successfully involved. As evidence of care co-ordination is based mainly on disease-specific programmes, our study makes valuable contributions to the practice of care co-ordination from a preventive and psychosocial perspective (Trivedi et al. 2013).

The programme was feasible in the three zones. Our findings provide some suggestions regarding the relevance of urban and rural contexts when intervening in loneliness in Spain, such as the need to work on confidentiality issues, especially in more rural areas. However, the differential findings observed in the zones cannot be attributed to the geographical and socioeconomic contexts.

The proportion of women was very high. While similar studies focusing on loneliness had a lower proportion of women (Pitkala et al. 2009), intervention studies aimed at boosting social capital had similar data (Fried et al. 2004), and also other group interventions in primary care in our country (Casañas Sánchez et al. 2009). This can be explained by the gender composition of the Spanish older population, by the fact that being female is a risk factor for loneliness, that women go to primary care more frequently and tend to express their loneliness more than men (Dykstra 2009). Our findings suggest that older men and women in Spain get involved in loneliness interventions with different goals. Nevertheless, the high proportion of

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Figure 3 Flow chart of participants during the study.
Table 2 Results pre- and post-intervention

<table>
<thead>
<tr>
<th>Psychosocial variables</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Statistic*</th>
<th>Degrees of freedom, confidence interval, effect size†</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling lonely, mean (SD)</td>
<td>2.18 (0.39)</td>
<td>1.91 (0.69)</td>
<td>-2.065</td>
<td>r: -0.365</td>
<td>0.039‡‡</td>
</tr>
<tr>
<td>Gierveld Loneliness Scale, mean (SD)</td>
<td>4.55 (2.05)</td>
<td>2.84 (2.33)</td>
<td>-3.645</td>
<td>r: 0.591</td>
<td>&lt;0.001††</td>
</tr>
<tr>
<td>Emotional loneliness subscale, mean (SD)</td>
<td>2.97 (1.52)</td>
<td>1.97 (1.70)</td>
<td>-3.068</td>
<td>r: -0.498</td>
<td>0.002‡‡</td>
</tr>
<tr>
<td>Social loneliness subscale, mean (SD)</td>
<td>1.58 (1.00)</td>
<td>0.87 (1.09)</td>
<td>-3.267</td>
<td>r: -0.530</td>
<td>0.001††</td>
</tr>
<tr>
<td>Relationship with friends</td>
<td>73.0 (n = 27)</td>
<td>93.9 (n = 31)</td>
<td>2.45</td>
<td>df: 31; Cl: 0.337-0.308</td>
<td>0.031†‡‡</td>
</tr>
<tr>
<td>(Social Resources Inventory in Older Adults), % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective Social Participation Index, mean** (SD)</td>
<td>4.54 (1.57)</td>
<td>3.64 (1.71)</td>
<td>3.491</td>
<td>r: -0.422</td>
<td>0.017†‡‡</td>
</tr>
<tr>
<td>Number of weekly outings, mean (SD)</td>
<td>7.51 (3.22)</td>
<td>9.70 (5.96)</td>
<td>-2.388</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health status and use of health services</th>
<th>Pre-test (n = 38)</th>
<th>Post-test (n = 36)</th>
<th>Statistic*</th>
<th>Degrees of freedom, confidence interval, effect size†</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-perceived health, mean (SD)</td>
<td>3.74 (0.72)</td>
<td>3.94 (0.89)</td>
<td>-1.414</td>
<td>r: -0.246</td>
<td>0.16††</td>
</tr>
<tr>
<td>Depression scale GDS-5, mean (SD)</td>
<td>2.05 (1.47)</td>
<td>2.12 (1.58)</td>
<td>-0.297</td>
<td>df: 31; Cl: -0.366 to 0.491</td>
<td>0.77††</td>
</tr>
<tr>
<td>Use of anxiolytics, % (n)</td>
<td>49 (n = 18)</td>
<td>47 (n = 17)</td>
<td>0</td>
<td>Cl: 0</td>
<td>1.00‡‡</td>
</tr>
<tr>
<td>Use of antidepressants, % (n)</td>
<td>43 (n = 16)</td>
<td>42 (n = 15)</td>
<td>-0.289</td>
<td>Cl: 0.284-0.660 to 1.851</td>
<td>1.00‡‡</td>
</tr>
<tr>
<td>Number of visits to the GP (last 12 months), mean (SD)</td>
<td>10.51 (7.88)</td>
<td>10.97 (5.72)</td>
<td>-0.538</td>
<td>df: 35; Cl: -1.851 to 3.184</td>
<td>0.59††</td>
</tr>
<tr>
<td>Number of visits to the nurse (last 12 months), mean (SD)</td>
<td>6.65 (7.71)</td>
<td>10.42 (11.24)</td>
<td>-2.802</td>
<td>r: -0.467</td>
<td>0.005†‡‡</td>
</tr>
<tr>
<td>Number of visits to social worker (last 12 months), mean (SD)</td>
<td>1.04 (1.95)</td>
<td>1.22 (1.73)</td>
<td>-0.106</td>
<td>r: -0.022</td>
<td>0.91††</td>
</tr>
</tbody>
</table>

SD, standard deviation.
*Degrees of freedom (df) and 95% confidence interval (CI) are presented when t-test applies; r (effect size) is presented when Wilcoxon signed-rank test applies.
††Statistic is presented when t-test applies. Z statistic is presented when Wilcoxon signed-rank or McNemar’s test apply.
‡‡Changes were in terms of amelioration.
§§Changes were in terms of worsening.
¶Eleven-item De Jong Gierveld Loneliness Scale: global score 0–11, subscales for emotional loneliness score 0–6 and social loneliness score 0–5. Higher scores indicate higher levels of loneliness (De Jong Gierveld & Van Tilburg 2010).
**Subjective Social Participation Index scale 0–8. Lower scores indicate a higher level of participation (Rubio et al. 2009).
††t-test for paired samples.
§§Wilcoxon signed-rank test for paired samples.
†††McNemar’s test.

females could have lowered the intervention effect, as studies with more women seem to have smaller reductions in loneliness (Masi et al. 2011).

Effects on loneliness and individual social capital

Loneliness decreased in frequency and intensity. As participants presented non-modifiable risk factors for loneliness (e.g. being female, widowhood and low education level), loneliness was successfully lowered probably because the intervention focused on modifiable components of social capital. Improvements in social and emotional loneliness suggest the possible efficacy of the intervention in building new and effective friendships. The intervention might also have triggered a change in their perception of social support. Besides, programme features from our model might have been effective.

Social support built within the group has helped to start and continue activities together. Thus, intervention components promoting cognitive and structural social capital elements could have reinforced each other. Furthermore, the long-term maintenance of social contacts and new activities suggests that a meaningful lifestyle change was successfully achieved.

Our study suggests the relevance of professionals, volunteers and community assets as key bonding elements for long-term contacts. However, it remains a
research challenge to understand how to achieve meaningful and lasting changes in lonely people’s lives.

Health effects

No immediate health effects were found. This could be explained by the reduced sample size, or by the programme’s design, implementation or duration. However, these characteristics enabled us to detect significant immediate effects on loneliness, social support and participation, and process indicators showed optimal implementation (results not shown). Additionally, health effects could have gone undetected by the measurement instruments applied. Nevertheless, these findings are consistent with other intervention studies: effects on social well-being are generally achieved but rarely on physical health (Fried et al. 2004, Ertel et al. 2009, Pitkala et al. 2009, 2011, Dickens et al. 2011). Moreover, participants’ low education level and bad self-perceived health suggest the appropriateness of a social capital-based intervention, as increasing social capital potentially contributes to health equality (Hunter et al. 2011).

Depressive symptoms had decreased at the 2-year follow-up. The long-term but not immediate effect on depressive symptoms could be explained by the maintenance of social activities and social contacts. Although divergent effects on mental health have been found when intervening in loneliness (Dickens et al. 2011, Saito et al. 2012), social capital seems to be related to reduced depression among older people (Forsman et al. 2012). Further research is needed on how to prevent and manage depressive symptoms related to loneliness.

Contrary to a previous trial, our study did not find a significant decrease in visits to the general practitioner or in hospitalisations (Pitkala et al. 2009). Moreover, our study is the first of this kind assessing the impact on visits to the nurse, social worker and emergency department. No effect was found other than a significant increase in visits to the nurse. This could be explained by the nurse’s role in the group, which could have increased the participants’ trust. The intervention could also have empowered participants to take more responsibility for their health. However, the heterogeneity of the reasons for visiting these professionals (e.g. chronic disease management, wound care, etc.) makes it difficult to interpret this increase.

Strengths and limitations of the study

This study contributes a novel approach in terms of the participating actors, the problems tackled and the strategy applied. Nevertheless, the study has some limitations. Due to the pre-post non-controlled design, results cannot be attributed to the intervention (Dimitrov & Rumrill 2003, López et al. 2011). However, the improvement could have been achieved through the intervention, as observational studies show that social networks remain stable or decrease during ageing (Shaw et al. 2007, Ertel et al. 2009). Furthermore, the study design accomplishes its explorative aim as a preliminary step for a definitive clinical trial (Campbell et al. 2007). Moreover, our design avoids the recently suggested ethical problem of randomised clinical trials, placing people suffering from loneliness into usual-care or wait-list groups, as untreated loneliness has potentially negative health effects (Masi et al. 2011). Accordingly, when experimental designs are ethically problematic, non-randomised studies bring valuable contributions (Thomson et al. 2004).

While the fact that the intervention promoted the social capital of older lonely people in their environment is a strength, the impact was only assessed at an individual level and the neighbourhood impact remains unknown.

The number of people who withdrew from the group-based programme is moderate but other studies confirm the difficulty of retaining this population (Routasalo et al. 2009).

Implications for further research, practice and policy issues

Future clinical trials could attempt to endorse a causal inference and to assess health effects, the use of health resources and cost-effectiveness. In addition, a qualitative methodology could help to understand the process of change among participants and effects that were not detected or difficult to quantify.

Differential strategies should be designed to successfully recruit both men and women, and more research is needed on gender issues in loneliness interventions in Southern European countries. It also remains a challenge to include and maintain persons suffering from health limitations that are closely linked to loneliness such as mobility disability, depression and hypacusia.

Our results support current health and social care policy to implement effective care co-ordination involving primary care and community assets as a key network to promote social capital.

In clinical practice, considering the increasing workload of primary healthcare professionals with the growing proportion of older people with chronic diseases (Contel et al. 2012), resources should be
increased to address their associated psychosocial problems such as loneliness. In this vein, our study contributes a promising non-pharmacological approach to prevent or manage loneliness-related depression.

The intervention design is extendable to other healthcare centres at a low cost as it involves using existing professionals and services, but creating new roles, strengthening networks and creating a new volunteer profile (Coll-Planas & Gómez 2012). Thus, it could become a useful resource to which health professionals might refer patients suffering from loneliness.

Conclusions

In summary, our study developed a feasible and culturally appropriate strategy, tailored to our health and social system based on social capital to alleviate loneliness. Moreover, our intervention tried to overcome behavioural challenges, used care co-ordination including community assets and achieved promising results.

A policy debate should be opened about the roles of primary health and social care, community services, and their responsibilities and priorities in implementing care co-ordination and programmes to relieve the increasing number of older people who suffer from loneliness. Moreover, the role of primary care promoting social capital should be also discussed as an increasingly important public health issue.

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Competing interests

The authors declare that they have no competing interests.

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