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The complexity of loneliness

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Summary. Loneliness is a prevalent and global problem for adult populations, and a number of different studies have linked it to multiple chronic conditions, including: heart disease, lung disease, cardiovascular disease, hypertension, atherosclerosis, stroke, and metabolic disorders, such as obesity and metabolic disease. Is a major predictor of psychological problems, such as depression, psychological stress, and anxiety. Loneliness is linked to overall morbidity and mortality in adult populations. But limited interventions have demonstrated long-term effectiveness in reducing loneliness in adults with these same chronic conditions. Our research of the extant literature addresses the following question: What evidence exists regarding the relationships between loneliness and health? We focus on recent findings with respect to the links between loneliness and health. (www.actabiomedica.it)

Key words: loneliness, isolation, older people, health, interventions, effectiveness

Loneliness is a multidimensional and complex construct

There are more and more elderly people living alone, and some of them are at risk of feeling lonely or socially isolated (1-2), although - as we shall see - loneliness and isolation are two different issues: a person can be alone and not feel alone and vice versa. Weiss (3) affirms that loneliness is a natural phenomenon, a (personal) feeling that may arise at certain moments in life and affect anyone, regardless of gender, age or other socio-demographic characteristics. He also explains that loneliness is often seen as rooted in weakness or self-pity, as something that - supposedly - the individual should be able to eliminate, since it is not a physical ailment. Furthermore, he makes the distinction between emotional loneliness and social loneliness. Other authors have defined loneliness from different perspectives: as a negative psychological response to a discrepancy between the social relationships one desires (expectations) and the relationships one actually has (objective, real ones); as an individual feeling characterized by an unpleasant or inadmissible lack of quality in certain social relationships that can occur either because one has fewer social contacts than one wishes to have, or because the level of intimacy hoped for in relationships is not there; as the subjective component of the objective measure of social isolation, in other words, loneliness would be the inverse of a situation of social support; as a social pain, something comparable to physical pain, because if physical pain arises to protect us from physical dangers, loneliness would manifest itself as a way to protect us from the danger of remaining isolated (related to the importance of social connections); etc.

In general, it is assumed that emotional loneliness refers to the absence of an attachment figure (together with feelings of isolation) and social loneliness as the lack of a social network, the absence of a circle of people that allows an individual to develop a sense of belonging, of company, of being part of a community. Both in daily life and in the research area, various researchers have referred to "loneliness" and

"social isolation" indistinctly. Others, however, find both terms very different from each other. Making accurate evaluations depends on a clear definition of the concept of loneliness, with special awareness of its multidimensionality and its differences with respect to related concepts (social isolations or a lack of social support). Loneliness and isolation place people at risk of vulnerability or social frailty; this dynamic concept of scarcity is closely linked to sustainability, development, social exclusion, poverty, and the lack of social support resources. Furthermore, social vulnerability is closely tied to physical frailty and mortality.

When evaluating loneliness, and considering the previous perspectives, some researchers have used a single question, taken from the CES-D (*'I feel lonely'*), or a single item, for example, *'Do you feel lonely?'* (4); '*Do you suffer from loneliness?*' (5); and '*Are you ever bothered by feelings of loneliness*?' (6-13), which is used only to measure the feeling of loneliness; meanwhile, others have used scales such as the UCLA Loneliness Scale (UCLA) (14-21) or the Jong Gierveld Loneliness Scale (dJGLS) (22-25), which are based on a more multidimensional perspective. The dJGLS scale, widely used in Europe and less in the Anglo-Saxon countries, is an eleven-item scale that combines both social and emotional loneliness, reflecting the more complex perspective mentioned above.

However you look at it, loneliness, that sense of lacking or privation, exerts a powerful influence over our health. There are multiple facets to loneliness: there are feelings of emptiness or abandonment associated with a lack of relationships or intimacy; there is the temporal perspective, (loneliness sets in over time) through which the individual perceives his or her own loneliness; there is the set of emotional aspects that accompany loneliness, including sadness, melancholy, frustration, shame or desperation; and, there is the individual's own subjective evaluation regarding the quality and quantity of his or her social relationships, built and rebuilt by the people in their lives, an evaluation which depends on the continuous interaction between factors which are rather diverse (identity, personality, expectations, life events, interpersonal engagement, socio-economic variables, household, etc.). Yet, despite all of this, while effective interventions are necessary, they are still scarce.

Loneliness and health

Health determinants can be divided into intrinsic (medical conditions and genetics, frailty, etc.) and extrinsic (physical and social environment), which, in turn, interact with each other, creating anomalous and bidirectional synergies. We note that some of these are social determinants, such as socioeconomic level (level of education, occupation, income, and social vulnerability), social relationships and support from family and friends. These factors have been linked to an increased risk of mortality (26). Our health and development are marked by our involvement in community social activities, our ability to take care of ourselves, our level of control over the circumstances of our lives, and by the context in which our relationship with the neighborhood, community and society takes place. Usually, most of these factors tend to be grouped under the concept of social vulnerability, which is calculated in a manner similar to the frailty index, that is, as a sum of deficits that can be measured and quantified (27). This social vulnerability has been associated with a higher prevalence of frailty and higher levels of hospital mortality (28-32).

The deficits linked to social vulnerability should not be considered apart; rather, they should be understood as an accumulation of deficiencies that provoke changes at the cellular and tissue level. Loneliness can contribute to alterations in cellular function, to an increase in vascular resistance (33) and to an increase in the incidence of specific diseases such as depression (14), cognitive deterioration and the progression of Alzheimer's disease (34), obesity (35), stroke and hypertension (36), many of which are mediated by an alteration in vascular resistance, an increase in sympathetic-adrenergic activity stimulated by an increase in the activity of the hypothalamic-pituitary-adrenal axis (HPA) (37), due to immune changes and to an increase in inflammatory activity mediated by the action of glucocorticoids and proinflammatory factors that increase leukocyte and lymphocyte activity (38).

This increased state of vulnerability mediated by inflammatory activity, the changes in the immune system and neuromuscular system and the influence, in turn, by social factors (socioeconomic level, level of education, abuse or mistreatment, life partner, social

networks and neighborhood) have not been studied as much as biological or clinical factors. We note that the definition of frailty syndrome has moved away from a purely physical criteria and has approached a more integral consideration of the individual, one that includes psychosocial criteria; in fact, a multidimensional origin of frailty (39-49) is currently proposed as the sum of physical, psychological and social deficits, with social frailty being, as yet, the least explored concept. Social frailty comprises alterations in three distinct social needs: affection, behavioral confirmation, and status (41). The lower the levels of fulfillment of these three needs, the more socially vulnerable or frail the individual will be (42), which makes for a reduced level of life satisfaction (43). However, this link between frailty and life satisfaction is significant among younger older adults as they weaken with age (44). In the context of poverty and social vulnerability, frailty has also been linked to a higher incidence of geriatric syndromes (less physical activity and greater immobility, urinary incontinence, recurrent falls, and depressive and cognitive disorders) (45), and loneliness has been associated with adverse health outcomes such as depression, functional deterioration, and frailty, which are geriatric syndromes, and mortality (46). This link could be due to the fact that inflammation associated with an increased activity of interleukin 6 (IL-6), C-reactive protein (CRP) and tumor necrosis factor alpha (TNF-a) is present in frail and in solitary individuals (47), while a poor social environment has been shown to significantly impact immunity (48) and poor social integration has been shown to alter neuroendocrine activity (49). On the other hand, it has been observed that positive emotions (feelings of happiness) attenuate the negative effects of perceived loneliness on physical activity and mortality (50). A recent literature review in patients with head and neck tumors concluded that geriatric syndromes such as functional impairment, affective and cognitive disorders, and a deteriorated social environment were linked to adverse health outcomes (51). Another recent paper described how social isolation, inadequate environment, inadequate living conditions and meager resources are risk factors for loss of independence, and, as such, would require social criteria to be included in screening programs for frailty (52). Poverty is also associated with an increase in the prevalence of frailty; this could be explained by the effects, direct and indirect, of psychosocial factors such as perceived control and social isolation (53). Similarly, when frailty and psychosocial factors are both present, their interaction tends to reduce the capacity to independently carry out activities of daily living (54), and pre-frail and frail older adults tend to have a smaller social network and higher levels of loneliness (55). A lower level of education also increases the risk of psychological and social frailty and reduced sleep duration, which is associated with the risk of physical, psychological and social frailty (56). Comorbidity, allostatic load, low levels of physical activity, symptoms of depression, cognitive deterioration and poor social support can also predict the onset of frailty, with poor social support having a moderating effect on social integration (57). The various frailty trajectories are also related to social groups and social and behavioral factors in subjects aged 60-69 and 70-79. Thus, social and behavioral factors are associated with frailty. The strongest of those associations are observed among the younger (58) and older. Female gender and marital status (being single) are also linked to the prevalence of frailty (59). The greater degree of social frailty is associated with a higher prevalence of disability (an increase of 66% among the socially frail as compared to the non-frail) (60), and this social vulnerability is associated with a higher mortality rate (61), although this associated negative effect weakens with age (62).

Social isolation, which is considered to be an objective and quantifiable reflection of the reduction in the size of the social network and the lack of social contact, is associated with an increased risk of developing cardiovascular disease (63), infectious diseases (64), cognitive impairment (65) and mortality (66). Once again, a link between social isolation and clinical disease has been described, the result of an increase in inflammatory activity (67) quantified by increases in CRP and fibrinogen (68, 69), and associated, in turn, with the onset of frailty.

There are three general paths by which social ties can have an impact on an individual's health, according to behavioral, psychosocial and physiological characteristics (70). In fact, psychosocial mechanisms such as social support and the capacity for personal control influence physiological processes, thereby modulat-

ing the body's immunity, metabolism and inflammatory capacity, all of which interferes with cardiovascular function. The HPA axis is sensitive to the brain's interpretation of threats and stressors and influences a wide range of physiological, behavioral, and health outcomes (71). Perceived social isolation is associated with increased HPA activity (72, 73), increased blood levels of catecholamines (74, 75), and with increases in cortisol and vascular resistance, mediated by a decrease in glucocorticoid receptor sensitivity (74).

Social isolation has been recognized as a significant risk factor for morbidity and mortality which may be mediated by neuroendocrine stress mechanisms, suggesting that chronic social isolation increases the activation of the HPA axis and that these effects depend on the interruption of a social bond: perceived social isolation activates an increased sensation of a threat and leads to an increase in symptoms of anxiety, hostility, fragmented sleep, fatigue, vascular resistance and genetic alterations, along with a decrease in impulse control, an increase in negativity and depressive symptomatology, as well as a greater, age-related deterioration in cognitive ability and the risk of dementia (34). In fact, those persons with a low social risk profile are shown to live an average of 5.4 years longer than their high social risk profile counterparts. A review on lifestyle factors (76) demonstrates the influence social relationships have on survival, and it provides data from two meta-analyses to substantiate this. In these analyses, it was observed that people with adequate social networks or relationships were 50% more likely to survive than older adults with social problems or poor or insufficient social relationships. Furthermore, it was observed that having a spouse or partner was also a significant predictor of survival, as evidenced by a 9-15% decrease in the risk of mortality (77). The authors of the review (76) point out that stronger social connections can alleviate stress and reduce the practice of poor lifestyle habits related to stress. However, any interpretation of the role many of these social factors play is hampered by the heterogeneity of life trajectories associated with genetic, social, environmental and biological factors, and with clinical conditions.

In addition, greater social vulnerability is a predictor of mortality and disability, although this relationship may be modulated by ethnographic and cultural factors, since this association was observed in continental European and Mediterranean countries, but not in Nordic countries (78). Reduced social support is also linked to lower survival rates in individuals with colorectal cancer. However, the same study does not indicate an objective relationship between social support and an increase in the incidence of site-specific neoplasms (79). Social isolation predicts mortality regardless of gender; this would include social predictors such as not being married, and, among men, participating infrequently in religious activities or not belonging to clubs or social organizations; while among women, the predictors were infrequent social contact and reduced participation in religious activities (80). In fact, living alone is associated with a greater incidence of death due to unknown causes and murder (81). A Japanese study of individuals living on remote islands described how living alone was significantly associated with a higher prevalence of frailty in men, but not in women (82). Similarly, patients from harsh social settings who are admitted to the hospital for a medical emergency present higher mortality rates, and are responsible for consuming more social resources and for a greater number of readmissions, although no differences in the length of hospital stay are identified (83). One meta-analysis observed how real and perceived social isolation are associated with an increased risk of early mortality, with the following weighted average effects: OR = 1.29 for social isolation; OR = 1.26 for the feeling of loneliness; and OR = 1.32 for living alone. The authors conclude that as a predictor of mortality, social isolation demonstrates a capacity similar to other more established factors (26). One study associated living alone with a mortality of 1.66 (95% CI, 1.05-2.63), with a higher mortality rate observed for men than for women; furthermore, a higher mortality rate was observed for single, divorced or widowed folks than for those who are married (84). Social isolation increases mortality in those who suffer chronic diseases involving proinflammatory mechanisms, as indicated by the observed high levels of fibrinogen and greater burden of inflammation in men (85). A link between mortality and isolation has also been observed in isolated and lonely people (86), in addition to the way in which social isolation and high poverty in the neighborhood were associated with an

increased risk of cancer-related mortality, attenuated by socioeconomic status and with no observed synergistic effect (87). There is a relationship between social isolation and loneliness; both are mortality predictors (88). However, after adjusting for confusing variables, only social isolation remained significant, and the relationship between social isolation and mortality was not affected by the presence of loneliness. A Finnish study (89) also observed the linear behavior of social isolation as a predictor of mortality and did not find a synergistic effect between social isolation and loneliness.

Loneliness is usually considered to be the psychological manifestation of social isolation, a reflection of the dissatisfaction the individual experiences regarding the frequency and closeness of his or her social contacts or the discrepancy between the relationships they have and the relationships they would like to have (90). Loneliness is linked to greater access to negative social information (91), with solitary people being more sensitive to pained facial expressions (92). A study involving functional magnetic resonance also indicated that loneliness is associated with greater activation of the visual cortex in response to negative social images (93). Loneliness was also associated with higher levels of cortisol (67, 74, 94) and impaired immune activity (95, 96) linked to the genesis of frailty. In this way, there is an increase in vascular resistance (97), sleep that is more fragmented (98), and an increased risk of cardiovascular disease and mortality (99, 100). In fact, the score on the frailty index was associated with loneliness, functionality and gender, with loneliness being the factor that contributed most to the frailty index score (101). The feeling of loneliness, in addition to clinical frailty, increased the length of hospital stays and the rates of hospital readmission for patients who lived alone (102). However, the link between loneliness and increased mortality is not clear: one cohort study conducted in Israel found no relationship between loneliness, functional and affective deterioration, and increased comorbidity or mortality (103), although another cohort study did find associations between loneliness and a significant increase in the risk of mortality, especially among women (104). The PAQUID study (105) determined that living alone and the frequent feeling of loneliness were both risk factors for mortality: Loneliness has been linked to premature mortality (106), with an increased risk of mortality mediated by the presence of a diagnosis of severe depression in men (107) and with genetic changes linked to the perception of loneliness that would decrease survival in patients with cancer (108). A study of institutionalized older adults found that independent of the diagnosis of cancer, emotional loneliness, age, education and comorbidity had an impact on mortality rates among elderly residents with no cognitive impairment (109). A subanalysis of the AMSTEL study observed how the feeling of loneliness, but not social isolation itself, was associated with a greater risk of developing dementia (110), though it is possible that the perception of loneliness may be indicative of a prodromal stage of dementia.

Likewise, socioeconomic status has been associated with mortality in patients with chronic kidney disease for whom multiple deprivation and serum phosphate levels were predictors of mortality (111), and a low socioeconomic level was associated with living alone, being single, with a pre-existing comorbidity, substance abuse, with the highest rate of bacteremia due to Staphylococcus aureus and nosocomial infections, with a higher rate of hospital admissions, and with higher mortality rates (112).

Interventions in loneliness

The aging process is accompanied by many changes derived from the life events characteristic of this stage of life. As people get older, they may be faced with life-altering situations, such as reduced social roles following retirement, the emancipation of their children, the death of their spouse or partner, diminished health or functional capacity, and the emotional impact of losing friends, family and peers. Any and all of the above contribute to older people having more limited social networks than younger people.

When we consider the intervention programs aimed at reducing loneliness and/or social isolation in older people and that provide evaluation and measurement data relating to the effect the program has on participants, we find the scientific literature is lacking in publications in this regard and that most of what

is published offers reduced samples and no control groups.

Various systematic reviews regarding interventions in the loneliness experienced by older people have found that the most effective interventions are group interventions. These interventions provide support and educational activities, are directed at specific groups, are supported by existing community resources, and include training and support for facilitators (113-115). The meta-analysis of interventions performed by Masi et al (116), divides intervention strategies into four types: those that increase social skills; those that are aimed at strengthening social support; those that increase opportunities for social interaction; and those aimed at socio-cognitive training.

If we consider the methodological design used, some interventions used a quasi-experimental design without a control group evaluating pre- and post-intervention. For example, Bartlett, Warburton, Lui, Peach, and Carroll (117) were interested in measuring the differential effectiveness of three types of intervention programs. The first type of program sought to develop individual and community skills, on the one hand by offering transportation to make it easier for people to attend activities and, on the other hand, by training participants for different tasks, such as volunteer bus driver, swimming coach and food handler, as well as offering conferences to discuss healthy aging. The second type of program sought to pair up volunteers and socially isolated elderly people in order to create a climate of trust and to encourage participation by these elderly folks in social activities. They would receive support gradually, in a way that would gradually promote their autonomy and independence. The third type of program developed a volunteer service aimed at elderly people who were socially isolated. A professional helped to recruit and train volunteers and share information and resources, offering social and leisure activities, in addition to library services for immigrant senior citizens, through two ethnic community organizations. The authors used the dJGLS scale (118) and a version adapted from the Duke Social Support Index (DSSI) (119) in order to measure differences. However, in the case of programs 1 and 2, they did not find significant differences in the levels of loneliness before and after, but a decrease was noted after program 3, following a significant increase in support. The intervention carried out by Pitkala, Routasalo, Kautiainen and Tilvis (120) was a randomized controlled trial, with an experimental group and a control group, and with pre- and post-intervention measures (at 3 and 6 months).

Some of the programs made use of qualitative evaluations - for example, Friendship Clubs (121); others focused on creative art, painting and poetry projects (122); and others involved phone calls (the 'Call in time' program funded by Help the Aged) (123).

Taking into account that different interventions have made use of different measurement instruments, it is often difficult to compare the effectiveness of the distinct interventions. Measuring subjective well-being may prove to be different depending on the scale used, for example: the UCLA in its different versions (UCLA, UCLA-R, UCLA-3) (124-125); the Jong Gierveld scale (126-127); the convoy model of social relations (128); the Lubben Social Network Scale (129); or other scales, such as the PANAS affect schedule (130).

The ways men and women live and age are different. Most of the interventions have been directed at both groups, but some programs have been directed only at women, such as The Friendship Enrichment Program (131), a program of 12 weekly classes focused on self-esteem, relationship skills, and on the different phases of friendship development, use and maintenance. Furthermore, the classes also focused on the practice of relevant social skills, such as: empowering older women in the process of meeting personal friendship goals; helping participants clarify friendship needs, desires, and expectations; analyzing their current social networks in order to identify real and potential friends; formulating goals that include the improvement of existing friendships or the development of new friendships; and developing strategies to achieve those goals. The program was also aimed at providing socially isolated elderly women (in groups of 8-12 people) with personalized activities, with a focus on creative stimulation and active and participative social contact. The objective was to stimulate passion and interest in life, by engaging them in creative, physical and cultural activities, with an emphasis on social interaction.

Findlay (113), Cattan, White, Bond, and Learmouth (114) Hagan, Manktelow, Taylor, and Mallett (132), have performed systematic reviews of interventions in loneliness and social isolation that have appeared in the scientific literature since 1970. Cattan, White, Bond, and Learmouth (114) identified and categorized 30 studies: 17 of them were group interventions, 10 were one-to-one, 3 were provided services, and 1 was community development. Most were implemented in the USA or Canada and reflected wide variability in design, method, and generalization of results. 9 out of 10 effective interventions were group interventions, involving support or educational groups, while 6 of the 8 ineffective interventions provided one-on-one support, general advice, information, or advice regarding health needs.

The review concluded that social and educational group interventions directed at specific groups can alleviate social isolation and loneliness in the elderly, and that the effectiveness of interventions focused on home visits and 'befriending' has not been demonstrated.

Stojanovic, Collamati, La Milia, Borghini, Duplaga, Rodzinka, Ricciardi, Magnavita, Moscato, and Poscia (133) conducted a review and updating of interventions in loneliness and social support published in Spanish and Italian, finding 15 that were quite different from one another and heterogeneous. 8 of these interventions demonstrated a reduction in loneliness, and 6 demonstrated a significant increase in social support and a reduction in social isolation. Among them, community programs that focused on art played an important role in increasing social inclusion. Educational interventions focused on social involvement and support were effective in reducing loneliness. The effectiveness of interventions that made use of new technologies and physical activity programs appear to be promising, although the above-mentioned authors also warn about the need to carry out proper interventions, ones that are well-designed and properly evaluated, in order to demonstrate the impact of these interventions on health (134) .

With consideration to the type of intervention, we find most of them focus on strengthening social bonds and friendship. The increase in the number of users of communication and information technologies has led many intervention programs to rely on the Internet and its possibilities in order to increase social networks and reduce loneliness. Authors such as Hagan, Manktelow, Taylor, and Mallett (132) recommend the use of new technologies to reduce loneliness. On the other hand, Chipps, Jarvis and Ramlall (135), after conducting a systematic review of e-interventions on 12 data bases, with published data from 2000 to 2017, identified 12 moderately efficient reviews and found that the primary studies were not rigorous enough. The authors concluded that the evidence for this type of intervention is inconsistent and weak.

Some interventions use new technologies in order to strengthen online networks, such as the Dutch Esc@pe program aimed at elderly people living in social isolation, with chronic illnesses or with disabilities, and who feel lonely (126). Another example of this type of intervention is the program in Israel developed by Shapiraa, Baraka, and Gal (136). Baraka, y Gal (136). Others are aimed at motivating participation in activities: One such intervention is the Upstream Healthy Living Center (137), a community program in which volunteers initially make weekly visits to participants and call them frequently by phone. Later, they involve participants in community activities at social centers, such as: painting, creative writing, reminiscence/life stories, Tai Chi, moderate physical exercise and activities, computer science, ceramics, exploring music and sound, arts and crafts, education regarding falls, cooking, singing, walking and talking groups, and book clubs. The objective of the program is to provide socially isolated elderly folks with personalized activities, with a focus on creative stimulation and active and participative social contact. They seek to stimulate their passion and interest in life, by engaging them in creative, physical and cultural activities, with an emphasis on social interaction.

Only some of the interventions are aimed at promoting good health and are specifically focused on improving perceived health or psychological well-being. For example, the program developed by Pitkala, Routasalo, Kautiainen and Tilvis (120) was aimed at making older people feel stronger and at promoting peer support and social integration. The intervention was applied to 15 groups (each composed of 7-8 participants and 2 professionals) that met 12 times over the course of 3 months and carried out activities such as therapeutic writing and group psychotherapy, group

physical activity and discussions on health, and art and inspirational activities.

Most of the interventions were carried out in a community context, and hardly any intervention was carried out in homes for the elderly. Of these, some use animal-assisted therapy such as the Banks and Banks program (124) or the program conducted by Vrbanac et al (137) involving weekly sessions with dogs. Other interventions made use of physical exercise (138) or indoor gardening programs to facilitate an increase in socialization and satisfaction with life, to reduce loneliness and to promote daily living activities among elderly people living in old age homes (139).

In general, the programs focused on reducing loneliness tend to improve perceived loneliness, psychological well-being, and symptoms of depression. The types of interventions that have been carried out in the institutional setting are varied: on the one hand, there are those which focus more on the subjective perception of loneliness, such as cognitive interventions (125), or on life history, such as reminiscence therapy programs (142). Others were aimed at improving happiness and reducing the depressive symptomatology that is often associated with loneliness, such as humor therapy (143). There are still other programs based on a physical exercise program and aimed at helping group participants work on their relationships (144); or programs offering gardening/horticulture workshops, where participants care for plants and gardens (139, 141) or programs based on animal-assisted therapy. (137). Finally, there is one type of program which aims to help participants maintain relationships, especially with family members, or initiate new relationships with others through the use of videoconferencing (145).

In the review conducted by Bermeja and Ausin (140), the authors were able to confirm that there is some evidence (moderate) of efficacy for all of these types of interventions, for those that involve animals (animal-assisted therapy) or caring for plants and gardens (horticultural therapy), for those focused on keeping in shape physically or on lifting one's mood (through humor or reminiscence therapy), or for those programs focused on maintaining social relationships (videoconferencing).

More than a dozen systematic reviews of solitary interventions have been carried out since 1984, and many of them have found a variety of resources to reduce loneliness. However, only one of them, Cattan et al (114), provides data on the impact of interventions on health.

In conclusion, interventions in loneliness and social isolation can reduce subjective or emotional loneliness by contributing to improving an individual's social network, community integration or social participation, but their efficacy in improving health has not yet been demonstrated. Samples are often small, and sometimes there is no control group. In the case of interventions carried out in old age homes, increasing the sample size is a complex task, given that a large part of the people who live there have functional, sensory and/or cognitive impairments that complicate their participation in programs of this type. Nonetheless, many of these people would benefit greatly from an intervention that would help alleviate their loneliness and isolation, which is often exacerbated by their situations of dependency. We have not found, among the scientific literature, any work directed specifically at this group.

In order to advance their effectiveness, some future lines of intervention should do the following: adapt their programs culturally and adapt them to the participants, taking into account the individuality of each person; adapt them in order to promote a healthy and active lifestyle; and, finally, they should emphasize group interventions, as this would allow participants to share experiences with others, to improve communication skills, and to establish new relationships. Another important consideration would be to seek interventions that empower the individual, allowing people to manage their own loneliness by accepting that loneliness may accompany us through our lives, while at the same time promoting the community networks of connection and support, which are also part of the interventions in loneliness.

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