

Remotely-delivered Interventions for Social Isolation and Loneliness in Older Adults

Introduction

Interventions have the potential to significantly improve the well-being of older adults experiencing social isolation and loneliness. While many psychosocial interventions have been developed and tested over the last several decades (Hoang et al., 2022), digitally-delivered interventions represent a more recent area of focus (Ibarra et al., 2020). Intervention approaches that leverage digital technologies improve accessibility by allowing for service access to those with functional limitations or in geographically isolated areas. They also enhance cost-effectiveness by reducing expenses associated with physical spaces (i.e., clinics or offices) and automating processes that may not require human interaction (such as psychoeducation). Digital interventions also have scalability advantages, allowing interventions to benefit a larger number of older adults.

This topic has direct relevance to social work. The Grand Challenges, published by the American Academy of Social Work & Social Welfare (Herbert 2016) frames the role of social workers directly - "Working in tandem with other key professions, social work possesses the unique expertise to greatly reduce the risk and consequences of social isolation. The "social" element of social work is the key for solving the Grand Challenge of reducing the risk of social isolation and strengthening social ties among all populations" (Lubben et al., 2015). Further calls within the Grand Challenges for Social Work also have bearing on social isolation and loneliness. These include advancing long and productive lives, closing the health gap, and harnessing the power of technology for social good. Intervention work is necessary to achieve these goals.

Interventions addressing social isolation and loneliness can take multiple forms. In one of the earliest systematic reviews of interventions in older adults (Masi et al., 2011), the authors

categorize interventions as motivated by one of five goals: 1) improving social skills, 2) enhancing social support, 3) increasing opportunities for social contact, 4) social cognitive training, and 5) integrative. This typology has been adopted in subsequent work (Welch et al., 2022). This preliminary response will explore remotely-delivered interventions for social isolation and loneliness among older adults. It will focus on social cognitive training and integrative interventions with a social cognitive component. This focus is informed by previous work that has identified social cognitive interventions as more impactful than other strategies (Masi et al., 2011). The prelim response will explore the characteristics of intervention studies and provide recommendations for future work based on these findings. Particular attention will be given to studies where participants significantly reduced social isolation or loneliness. Multiple digital interventions have been tested across the five goals detailed by Masi et al. (2011). However, few have had effect sizes $> .2$ or have found statistically significant decreases in social isolation or loneliness.

Systematic Reviews and Meta-Analyses

Multiple systematic reviews overviewing interventions for social isolation, loneliness, or both have been completed. These reviews often define interventions broadly, so they may include approaches such as music therapy, animal therapy, or robotic pets (Hoang et al., 2022; Ibarra et al., 2020). Further, many existing reviews do not separate remotely-delivered interventions from in-person interventions. One recent review of reviews noted that studies used the same terms to categorize different intervention components, and many did not clearly define the terms they used. (Fakoya et al., 2020). For interventions broadly (not categorizing by approach), one meta-analysis (Jarvis et al., 2020) found the pooled effect size for interventions using the UCLA Loneliness scale as an outcome to be small (Cohen's $d = .25$) and the pooled effect size in interventions that used the de Jong Gierveld Loneliness Scale was negligible

(Cohen's $d = .04$). Across interventions broadly, loneliness is a far more studied outcome measure than social isolation (Cattan et al., 2005). In examining across interventions, neither group-based format nor the use of technology appears related to effect size (Masi et al., 2011).

While multiple systematic reviews have included remotely-delivered interventions using a social cognitive approach, none focus expressly on these interventions. One review, an evidence and gap map, is currently underway that will synthesize findings. This study, however, has only provided provisional findings through a protocol paper (Welch et al., 2022). One systematic review and meta-analysis (Shah et al., 2021) examined digital technological interventions (DTIs), which they defined as any digital platform-based technology that allows for communication or education. They concluded that existing studies are of poor methodological quality and that current research does not support the effectiveness of DTIs in reducing loneliness in older adults.

Study Selection

This prelim response will examine a specific subset of interventions that meet the following criteria: 1) the average age of participants was at least 60 years, 2) a social cognitive approach informed the intervention, 3) loneliness or social isolation was included as either a primary or secondary quantitative outcome measure, and 4) the study involves a comparison or control group. The characteristics of studies meeting these inclusion criteria will be discussed, and attention will be drawn to those demonstrating relative success. Studies were located through existing related systematic reviews and meta-analyses, reference lists in publications, and the comprehensive bibliography of a protocol paper by Welch et al. (2022). Additional studies were located via searches of keywords on PubMed and Google Scholar. This resulted in 14 studies, all published between 2003 and 2023.

Overall Intervention and Study Characteristics

While some interventions treated loneliness or social isolation as a primary outcome measure (Boekhout et al., 2021; Hartke & King, 2003; Jarvis et al., 2019; Shapira et al., 2021), other interventions included social isolation and loneliness as secondary outcome measures. Primary outcome measures for these studies included depression or anxiety (Bruce et al., 2021; Choi et al., 2021; Choi et al., 2020; Gilbody et al., 2021; Nelson et al., 2019; Tomasino et al., 2017), quality of life (Dichter et al., 2020; Gustafson et al., 2022), and physical activity (Matson et al., 2019; Matz-Costa et al., 2018)

The most common therapeutic model used in interventions was cognitive behavioral therapy (CBT). Some studies used variants of CBT, such as low-intensity CBT (Jarvis et al., 2019) or focused on specific techniques in CBT, such as behavioral activation (Choi et al., 2021; Choi et al., 2020). Target populations included homebound older adults (three studies), caregivers (two studies), older adults with chronic conditions (five studies), older adults with sedentary lifestyles (two studies), and community-dwelling older adults who endorse social isolation and loneliness at baseline or are considered at risk for doing so (two studies).

Several studies used formalized programs, including ElderTree (Gustafson et al., 2022), I-STAND (Matson et al., 2019), Engaged4Life (Matz-Costa et al., 2018), CARE (Nelson et al., 2019), and TALKING TIME (Dichter et al., 2020). While all interventions were remotely delivered, the exact delivery format varied. Five interventions were delivered via phone, two via website, and two via videoconference. The remaining interventions used a combination of approaches (e.g., videoconference and website). Nearly all programs provided some form of reference materials such as handouts, workbooks, or other informational products. For those interventions that involved contact via phone or videoconference, project staff had a range of training and expertise. Seven interventions opted for "lay counselors" or "coaches," meaning

volunteers or providers with a bachelor's degree or less and little to no formal prior experience. The remainder used either master's or doctoral-level clinicians. Nine interventions were completed either independently or with one-on-one support, and the remaining five were completed in groups or a combination of group and individual work. Intervention length ranged from four weeks to one year, with most taking 2-4 months to complete.

With respect to demographics, studies showed a strong gender bias, with participants far more likely to be female. Only one study had >50% male participants. Two had between 50-59%, five had between 60-69%, two had between 70-79%, and four had greater than 80% female participants. In ten studies, participants' average age was in their seventies, and the remainder averaged in mid to late sixties. Seven of the eleven studies that reported race or ethnicity reported that more than 80% of their participants were non-Hispanic and White. For the 12 studies that reported education or income, participants tended to be high-income or have beyond a high school education. Most studies took place in the United States (nine), while one study each was conducted in the Netherlands, Germany, the United Kingdom, South Africa, and Israel. Three studies had over 100 participants for the overall sample size; the remaining studies averaged 64 participants.

Findings

Unsuccessful Interventions

While the overall goal of this preliminary response is to highlight characteristics of successful interventions and make recommendations for future work based on these, it is informative for the sake of contrast also to consider interventions that have not been successful. For social isolation and loneliness outcomes, seven of the studies failed to find significant improvement in the outcome measured. With the exception of one study, the studies that did not find statistically significant improvements in social isolation or loneliness still found minor

improvements in the intervention groups relative to the control groups. The exception to this was an intervention that involved a workshop and twice weekly peer support mentoring, which found a decrease in the number of daily social interactions from baseline in the intervention group. In contrast, the control group had an increase in social interactions (Matz-Costa et al., 2018).

In two studies that targeted caregivers and one study of older adults with cancer, the interventions failed to produce favorable improvements. The study by Dichter et al. (2020) enrolled participants providing care for those with dementia and evaluated changes in perceived social support after a 3-month telephone intervention using linear models to estimate expected values of the differences in outcome measures between pre and post time points. In their analysis, adjusted differences between the control and intervention groups were not statistically significant. In the second intervention (Hartke & King, 2003), which involved stroke caregivers receiving an 8-week psychoeducation telephone group intervention, those who received the intervention did not have a statistically significant decrease in loneliness post-intervention or at follow-up compared to a control group. The study that targeted older adults with cancer (Nelson et al., 2019) found no statistically significant differences in loneliness as measured by the UCLA Loneliness scale at post-intervention or 2-month follow-up between groups. The intervention condition involved one-on-one phone conversations with a mental health clinician and weekly homework. The control group received care-as-usual, which involved brief contact with a geriatric social worker.

Three remaining studies did not demonstrate a significant effect on social isolation or loneliness; two were health-focused interventions. The first of these was a website called ElderTree which was designed to improve quality of life, social connection, and independence (Gustafson et al., 2022). The intervention was unstructured in that participants had no sessions or contact with coaches or clinicians but had access to the website that included interactive

information, self-management, health, and motivational resources. They measured received and provided social support and tested differences between the two groups using cumulative link mixed models for each outcome across three time points. They found no improvement in either measure of support. The second intervention, a program called I-STAND, involved six coaching sessions and was intended to improve mobility among participants who had a body mass index of $\geq 30\text{kg/m}^2$ and qualified as sedentary based on other criteria (Matson et al., 2019). The intervention lasted 12 weeks, and they measured social support at baseline and post-intervention. Comparing the intervention to the control group, they did not find differences in mean change scores. The last study involved an 8-week CBT program with 16 sessions (Tomasino et al., 2017). Participants either received the intervention with individual coaching, peer support, or a waitlist condition. Social isolation was measured using the Patient-Reported Outcomes Measurement Information System – Social Isolation. Their analysis did not find statistically significant differences between groups or changes within each group.

Successful Interventions

Seven interventions from studies identified in this review reported statistically significant decreases in either loneliness or social isolation. Three of these studies (Bruce et al., 2021; Choi et al., 2021; Choi et al., 2020) were based on the same core program but differed in comparator conditions, follow-up period, and measures used. The Choi et al. (2020) and Bruce et al. (2020) papers draw on the same sample, but the Bruce et al. (2020) paper also includes a 1-year follow-up. These studies compared a one-on-one coach-facilitated behavioral activation videoconference program with friendly visiting. Both measured social isolation using the Patient-Reported Outcomes Measurement Information System – Social Isolation and Duke Social Support Index. Analysis in the Choi et al. (2020) paper used mixed-effect regression models with a random intercept that treated the two follow-up time points as dependent variables and

condition treated as a dummy variable. They found that participants in the behavioral activation intervention reported higher levels of social interaction ($d_{GMA-raw} = 0.36$), satisfaction with social support ($d_{GMA-raw} = 0.29$), and lower levels of loneliness ($d_{GMA-raw} = -0.60$). Extending these findings, Bruce et al. (2021) found that this effect was maintained over one year, though slightly attenuated. The Choi et al. (2021) paper involved the same interventions in a larger sample size ($N = 195$ rather than $N = 89$) and included a problem-solving therapy condition. In an attention-to-treat analysis, the tele-behavioral activation and tele-problem-solving therapy conditions increased the participant's social engagement and satisfaction with social roles relative to an attention control condition.

Of the four remaining successful interventions, two were intended to address loneliness in the context of the coronavirus pandemic. One study by Gilbody et al. (2021) was designed as a one-on-one phone intervention and emphasized behavioral activation. They measured loneliness using the de Jong Gierveld Scale. At three-month follow-up, the adjusted mean difference between the two groups suggested that the intervention decreased loneliness. In the second intervention tested in the context of the coronavirus pandemic (Shapira et al., 2021), participants received seven twice-weekly group sessions via Zoom or were assigned to a control condition. All participants were community-dwelling older adults; loneliness was measured using the UCLA Loneliness Scale before and after the intervention. Directly following completion of the intervention, the between-group effect size was $d = 0.58$. Unlike most studies included in this review, the study by Shapira et al. (2021) did not include a follow-up beyond directly after intervention completion.

The final two successful interventions were randomized control trials of tailored content. The first used a computer-based program called Active Plus, which is tailored to older adults with chronic diseases (Boekhout et al., 2021). The intervention lasted three months, and

participants received personalized written materials, advice, and psychoeducation based on completed questionnaires. The materials they received encouraged physical activity and social connectedness and were customized based on a participant's age, functional limitations, gender, and chronic illnesses. Using multilevel linear regression, the authors measured loneliness twelve months after the baseline interview. Participants in the intervention group scored significantly lower on loneliness as measured by the de Jong Gierveld scale than control group participants. The last intervention involved a low-intensity CBT program designed to reduce loneliness (Jarvis et al., 2019). The intervention was delivered via WhatsApp and lasted three months. Participants were provided with smartphones with mobile data. Aside from use in the intervention, participants were encouraged to use their new phones to increase social contact. The intervention involved group technological training and psychoeducation. Based on surveys they completed, participants also received tailored content related to maladaptive social cognitions. Social isolation was measured using the Young Schema Questionnaire – Short Form and loneliness was measured using the de Jong Gierveld Scale. In comparing the intervention and control group, those that received the intervention had lower levels of social isolation and loneliness both directly after completing the intervention and at 1-month follow-up.

Synthesis

This section will consider characteristics shared across successful interventions and characteristics that appear to have little influence on intervention efficacy. Several factors appear common among successful interventions, including specific condition and population targeting, tailored content, technological support, and a well-defined therapeutic model. Interventions that targeted loneliness specifically appeared to be more successful. Many of the interventions that did not meaningfully decrease loneliness or social isolation included these measures as secondary outcomes. Loneliness or social isolation did not need to be exclusively targeted, such

as in the tele-delivered behavioral activation intervention by Choi et al. (2020, 2021), which was designed to improve both mood and social engagement. Successful studies also often targeted specific populations or circumstances experienced by participants, such as being homebound, having multiple chronic conditions, or experiencing isolation in the context of the coronavirus. This finding suggests that interventions are most effective when they provide content directly relevant to participants' life context (though this approach was unsuccessful for caregivers).

Successful interventions also tended to be informed by a development process that involved input from community stakeholders, potential service consumers, and service providers. While the exact process of eliciting this input and how it was translated into program content was not detailed in any of the papers, all but one study mentioned a collaborative community-based approach to program development. Another common feature among successful interventions was technological support. These interventions used a variety of digital technologies, including videoconferencing platforms (Zoom and WhatsApp) and custom-designed websites. Successful interventions often included ongoing individual technical support, training, or access to a help desk. Of note, only one successful intervention relied on phone contact alone, and both participants and therapists in that intervention reported that they would have preferred the intervention to be delivered via videoconference (Gilbody et al., 2021).

Lastly, successful interventions used a well-defined therapeutic model. CBT informed six of the seven successful interventions. The remaining intervention was informed by social cognitive theory. The interventions using CBT therapy all included some form of psychoeducation. Four focused on behavioral activation and the other two included multiple components such as relaxation, identifying cognitive distortions, and positive self-talk. All successful studies also included written content such as reading materials, worksheets, or

workbooks. However, this approach was not exclusive to successful interventions, so should be regarded as necessary but not sufficient for future interventions.

Across studies, multiple factors did not appear to contribute to study success. This could be evidenced by the given characteristic being shared by successful and unsuccessful interventions or low consistency of the characteristic across successful studies. Factors that did not appear to contribute to intervention success included the overall duration, who led the intervention, and if delivery was individual or group-based. Successful interventions varied in length between five weeks and three months. This length was typical of interventions overall, except for one intervention (Gustafson et al., 2022) that did not produce meaningful decreases in social isolation or loneliness.

The disciplinary background of the facilitator or coach of a given intervention was unrelated to group success. However, given the shortage of mental health professionals, the most promising approach was the use of lay professionals. This has two major advantages over using master's or doctoral-level clinicians, cost and availability. Given the shortage of mental health providers and budgetary limitations of service agencies, trained lay providers appear to be a reasonable alternative to licensed clinicians. Additional uncontrolled intervention studies using lay coaches have also found favorable outcomes related to social isolation and loneliness (Xiang et al., 2023). Lastly, if the intervention was delivered individually or in group format did not appear to impact the intervention's effect. This echoes findings from earlier meta-analyses (Masi et al., 2011).

Future Directions

Among interventions addressing social isolation and loneliness, previous work has noted that older adults are the most frequently studied population (Hickin et al., 2021). Even so, existing work has multiple gaps. Aside from focusing on functional limitations and

socioeconomic status, current intervention work does not consider or discuss marginalized identities. Current research is primarily based on findings from White, middle-class, and educated participants. Work that focuses on high-risk sub-groups is needed. Focusing on work to be done in the U.S., three areas for future research are LGBT older adults, older adults in long-term care, and African American older adults. Though some work (Perone et al., 2020) has investigated interventions among LGBT older adults, more work is needed among this population. This is particularly important given previous findings regarding high levels of loneliness among LGBT older adults (Kim & Fredriksen-Goldsen, 2016). Older adults in long-term care are also at an elevated risk of experiencing social isolation or loneliness relative to those who are community-dwelling (Boamah et al., 2021). Among the interventions reviewed in this preliminary response, none were targeted or included a large proportion of African American older adults. African American older adults are under-researched in both longitudinal work regarding the health outcomes of social isolation and loneliness and intervention work (Taylor, 2021).

Another shortcoming in prior research is the high gender imbalance. Previous meta-analyses have noted that the effect size of an intervention is inversely related to female gender composition, such that studies with a larger proportion of males are more impactful (Masi et al., 2011). This is particularly noteworthy given that social isolation is more strongly associated with poor physical and mental health outcomes in males (Taylor & Taylor, 2018). Future work can also benefit from measuring biomarkers and other health-related outcomes (e.g., cognitive function, stress response, hospitalizations, and other health events). Prior in-person interventions (Theeke et al., 2016) have included measures of blood pressure and found that an intervention targeting loneliness in older adults decreased systolic blood pressure over ten points mm HG

over a four-month period, which is equivalent to some antihypertensive medications (Dimmitt et al., 2019).

The interventions reviewed in this prelim response focused on individual-level psychological and behavioral change. Interventions did not consider larger systemic contributors to loneliness or social isolation, such as policy and environmental factors. Intervention work that addresses social cognitive training and larger policy or community factors has yet to be explored. With respect to modalities, CBT therapy was the most commonly tested therapeutic modality. Additional approaches, such as Acceptance and Commitment Therapy, may have equal or greater effect. Scholars have suggested that Acceptance and Commitment Therapy may be uniquely well-suited to work with older adults (Petkus et al., 2013), and one recent pilot intervention found Acceptance and Commitment Therapy through a remote platform feasible in older adults (Zarling et al., 2023).

Several successful interventions included in this review were either transdiagnostic or targeted both depression and loneliness. Component analysis studies may offer information regarding important elements of these interventions and their differential relation to outcomes. Future work should also consider follow-up periods and measurement of social isolation. Prior work has noted the need for more extended follow-up periods in social isolation and loneliness interventions, as the effect of the intervention may lag well beyond the immediate weeks or months following program completion (Theeke et al., 2016). Interventions included in this review addressed loneliness more frequently than social isolation. This is likely partly due to the existence of several well-established and common measures, such as the de Jong Gierveld Scale and UCLA Loneliness Scale. Future work should also include social isolation as a primary outcome, given the close conceptual relationship between the two (Newall & Menec, 2019).

Conclusion

This preliminary response overviewed remotely delivered interventions for social isolation and loneliness among older adults focusing on interventions tested in randomized control trials. Loneliness has received far more attention than social isolation in intervention work. Successful interventions were characterized by specific condition and population targeting, tailored content, technological support, and a well-defined therapeutic model. Interventions that targeted loneliness specifically appeared to be more successful. This response did not consider pilot feasibility or pilot trials of interventions, so some promising approaches may have been excluded. Further work is needed to establish the ideal components and characteristics of remotely delivered interventions. Some existing work has pointed to potential promising interventions, but further work is needed to establish best practices.

Some health consequences resulting from social isolation and loneliness, such as cognitive impairment, have few effective treatment options available (Pérez-Palmer et al., 2022), which underscores the high value of interventions that target risk factors. The population of older adults in the United States and globally will continue to grow, increasing the prevalence of social isolation and loneliness. These conditions can have significant negative impacts on both physical and mental health. Interventions that leverage digital technologies improve accessibility for older adults with functional limitations or those in geographically isolated areas and also enhance cost-effectiveness and scalability.

There is a clear need for more inclusive research in this area. Current research is primarily based on findings from White, middle-class, and educated participants, leaving significant gaps in understanding intervention impact among other populations. Interventions should be both effective and equitable. Future research should focus on sub-groups, such as LGBT older adults, older adults in long-term care, and African American older adults.

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