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Interventions in ambulatory healthcare settings to reduce social isolation among adults aged 18-64: a systematic review

Kavya Anchuri^{1,2,3}, Liane Steiner^{1,2}, Roxana Rabet¹, Amy Craig-Neil¹, Ellah San Antonio¹, Segun Oluwasegun Ogundele¹, Melanie Seabrook^{1,4}, Ceinwen Pope², Serina Dai², Andree Schuler³, Carolyn Ziegler⁶, Andrew D. Pinto^{1,2,3,4,5*}

1. Upstream Lab, MAP Centre for Urban Health Solutions, Li Ka Shing Knowledge Institute, Unity Health Toronto
2. Dalla Lana School of Public Health, University of Toronto
3. Department of Family and Community Medicine, St. Michael's Hospital
4. Institute for Health Policy, Management and Evaluation, Dalla Lana School of Public Health, University of Toronto
5. Department of Family and Community Medicine, Faculty of Medicine, University of Toronto
6. Library Services, Unity Health Toronto, St. Michael's Hospital, Toronto, Ontario, Canada

****Address correspondence to:***

Andrew D. Pinto

Upstream Lab, MAP Centre for Urban Health Solutions, Li Ka Shing Knowledge Institute, Unity Health Toronto

30 Bond Street, Toronto, ON, M5B 1W8

416-864-6060 x76148

andrew.pinto@utoronto.ca

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Abstract

Background: Social isolation is associated with increased all-cause and premature mortality, poor chronic disease management, and mental health concerns. Limited research exists on interventions addressing social isolation among individuals under 65 despite its increasing prevalence among young and middle-aged adults.

Aim: To identify interventions from the extant literature that address social isolation and loneliness in ambulatory healthcare settings in adults aged 18-64, and to identify elements of successful studies for future intervention design.

Design and setting: Systematic review of interventions targeting social isolation in community-dwelling adults aged 18-64 within ambulatory healthcare settings.

Methods: A search strategy was developed to identify relevant articles in the following databases: Ovid MEDLINE, Embase, EBM Reviews, Scopus, CINAHL and PsychInfo. Data were extracted on study design and setting, intervention type, outcome related to social isolation/loneliness and scale of measure used.

Results: 25,078 citations were identified and underwent title and abstract screening. 75 articles met our inclusion criteria and were synthesized, including an assessment of bias. Effective interventions were delivered in community health settings, incorporated a group component, and used digital technologies. They also addressed the association between mental health and social isolation using CBT approaches and enhanced self-management and coping strategies for chronic conditions through psycho-educational interventions.

Conclusion: Future research should prioritize adults living in low- and middle-income countries, racialized individuals, as well as those with fewer educational opportunities. There is also a need to advance research in primary care settings, where longitudinal patient-provider relationships would facilitate the success of interventions.

Keywords: social isolation; loneliness; primary care; primary health care; social determinants of health; intervention.

How this fits in

The literature on interventions targeting social isolation and loneliness among adults over 65 is robust. However, less attention has been paid to interventions specifically addressing social isolation among individuals between the ages of 18-64 within ambulatory healthcare settings. This systematic review identifies key elements of successful studies to inform future intervention design, which include delivery in a community health setting, the use of a group component, integrating CBT principles and psycho-educational components, and using technology to ensure that interventions are both long-lasting and flexible. Given the longitudinal relationship between patients and providers, and the opportunity for integrating wraparound and multidisciplinary care, primary care providers can play an instrumental role in implementing such interventions and addressing social isolation among their patients.

Introduction

Social isolation is a target of intervention for public health researchers, given its associations with increased all-cause mortality,¹⁻⁶ increased premature mortality,⁷ worse chronic disease management,^{8,9} and mental health concerns.¹⁰ For example, social isolation has been compared to smoking (15 cigarettes/day) and high levels of alcohol consumption (6 drinks/day) as a predictor of mortality.¹¹

Most of the research in social isolation interventions has focused on older populations. A systematic review of social isolation among older adults has shown that animal therapy and technology-based interventions had the largest effect on social isolation but found a low quality of evidence.¹² While social isolation and loneliness is often thought of as a problem mainly affecting older populations, there is an increasing prevalence of social isolation among adults under 65 years of age.¹³ In a cross-country survey of adults in the United States, the United Kingdom, and Japan, it was found that the majority of people reporting loneliness were younger than 50.¹⁴ In adolescents and young adults, loneliness and social isolation have been associated with increased odds of asthma, migraine, arthritis, hypertension, depression and anxiety, alcohol use, and poor educational achievements.^{15,16} A recent call to action published in *JAMA Psychiatry* identified the need for clinical evaluations of interventions designed to enhance social connectedness.¹⁷ With the recent establishment of the World Health Organization Commission on Social Connection (2024-2026), addressing social isolation has risen to a global public health priority, prompting the scaling up of evidence-based solutions in countries of all incomes, and across all age groups.¹⁶

Ambulatory care settings, particularly primary care settings, are strategically situated to identify and address social isolation in patients. Primary care settings are often the first point of contact between a patient and the healthcare system.¹⁸⁻²⁰ Additionally, the provision of long-lasting, continuous care by primary care teams allows them to become a trusted source of health information for patients.¹⁹

To our knowledge, few studies have addressed social isolation interventions among the population under 65. Thus, in this systematic review, we aimed to identify interventions targeting social isolation in adults aged 18-64 and elucidate the role of ambulatory care settings, particularly primary care settings, in hosting and delivering such interventions. We further aim to distill key facets of effective interventions that address social isolation to make recommendations for future interventions.

Methods

We completed a systematic review of the literature to identify studies evaluating an intervention targeting social isolation delivered through ambulatory healthcare settings and describe key elements of effective interventions. This review was registered on PROSPERO (CRD42016049518).

Search strategy

A search strategy was developed by an information specialist in consultation with the team, using a combination of subject headings and keywords adapted for each database, for the concepts of “social isolation,” “loneliness” AND “ambulatory care.” Key terms were searched in the following databases: Ovid MEDLINE, Embase (OVID), The Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials (Ovid), Scopus, CINAHL (EBSCOhost) and PsycINFO (Ovid). We retrieved articles published since database inception and September 27th, 2023 (the date of the final search). The search was limited to studies that included adults aged 18 to 64. Please see [Supplementary Box 1](#) for the full search strategy.

Study selection

The eligibility criteria were developed using PICO (Table 1). There were no restrictions on language, year, or study methodology.

Table 1 Inclusion and exclusion criteria

	Inclusion	Exclusion
Population	Adults 18 years and older.	Adults 65 years and older. To maintain focus on our target population, we excluded interventions that included individuals 18-64 but primarily targeted people 65 and over.
Intervention	Primarily focused on reducing social isolation and explicitly stated goal of program. Intervention is implemented/delivered through ambulatory health care settings (e.g., primary care clinic, walk-in clinic, out-patient specialist clinic, emergency department, mobile clinic, prison clinic). Patients are recruited through ambulatory health care setting, OR the intervention is delivered (all or in part) by staff of the ambulatory health care setting, OR the intervention is a partnership between an	Articles that did not have “social isolation” or “loneliness” as study outcomes were not accepted, even if the outcome was semantically related to social isolation, such as “social inclusion”, “social integration”, “social connectedness,” “social support,” “social skills,” and “social functioning.”

	ambulatory health care setting and another agency.	Inpatient or institutionalized settings were excluded.
Comparison	No intervention or standard of care.	
Outcome	Stated social isolation and/or loneliness as an outcome, measured via any previously validated instrument (e.g., UCLA Loneliness Scale, De Jon Gierveld Loneliness Scale) or through a qualitative assessment.	
Types of study	Experimental, observational, mixed-methods or qualitative studies.	Commentaries, opinion/editorials, reviews.
Other	There were no restrictions on language, year, or study methodology.	

Screening

DistillerSR²¹ was used to manage articles during the screening process. In the first round of screening, title and abstracts were screened by two reviewers for relevance. In the second round of screening, the full text was reviewed by two reviewers to determine if it met the inclusion criteria. Any disagreements were settled by a third reviewer.

Data extraction

The following information was extracted from each included article, using a standardized data extraction form (Supplementary Table 1): rationale, intervention, sampling technique, participant characteristics, outcomes related to social isolation or loneliness, results, limitations identified by the authors, and possible sources of bias.

Quality appraisal

Each article was appraised by one to two reviewers to assess the risk of bias and methodological rigour. As this systematic review aimed to survey all available literature pertinent to our research question, we included all study designs. To ensure that quality appraisal was appropriate to the study methodology, we used four previously validated quality appraisal tools corresponding to the four distinct study designs in this review.

The Cochrane Risk of Bias tool was used to appraise experimental studies. The tool assesses seven domains of potential bias via a set of signalling questions, which is used by an algorithm to generate a risk of bias rating of “Low” or “High” or “Some concerns.”²²

Observational studies were appraised using a nine-point rigour scale, adapted from an eight-point rigour assessment tool developed by The Evidence Project²² with scores ranging from 1 (high risk of bias) to 9 (low risk of bias), reflecting study quality.^{23,24}

We used the Critical Appraisal Skills Program (CASP) checklist for qualitative studies.²³ The tool has ten questions, each focusing on a specific methodological aspect of the study. The relevant text from each study related to each CASP item was noted and rated by the reviewing author and cross-checked by a second author.

For mixed-methods research studies, we used the Mixed Methods Appraisal Tool (2018), which assessed five sources of bias for each type of study.²⁴ Quantitative studies were assigned a score out of 5, while mixed-methods studies were assigned a score out of 15. Quantitative studies with a score of 4 or 5 and mixed-methods studies with a score of 12 or above were considered to have a low risk of bias.

Data synthesis

We conducted a narrative synthesis to identify common intervention types and key components of effective interventions. Quantitative and mixed-methods studies that showed a significant positive effect on social isolation and/or loneliness measures or qualitative studies reporting improvements in social isolation and/or loneliness were considered "effective." Those reporting mixed outcomes—for example, showing positive results over time but not directly due to the treatment—and those that failed to clearly report their findings were also noted.

Results

Study identification

The literature search identified 16,884 citations after duplicates were removed. Title and abstracts were screened by two reviewers and 15,060 records were excluded. Full-text articles were screened by two reviewers, and 1,674 articles were excluded. Following full-text screening, 75 articles met eligibility criteria and were included in the final review (Figure 1).

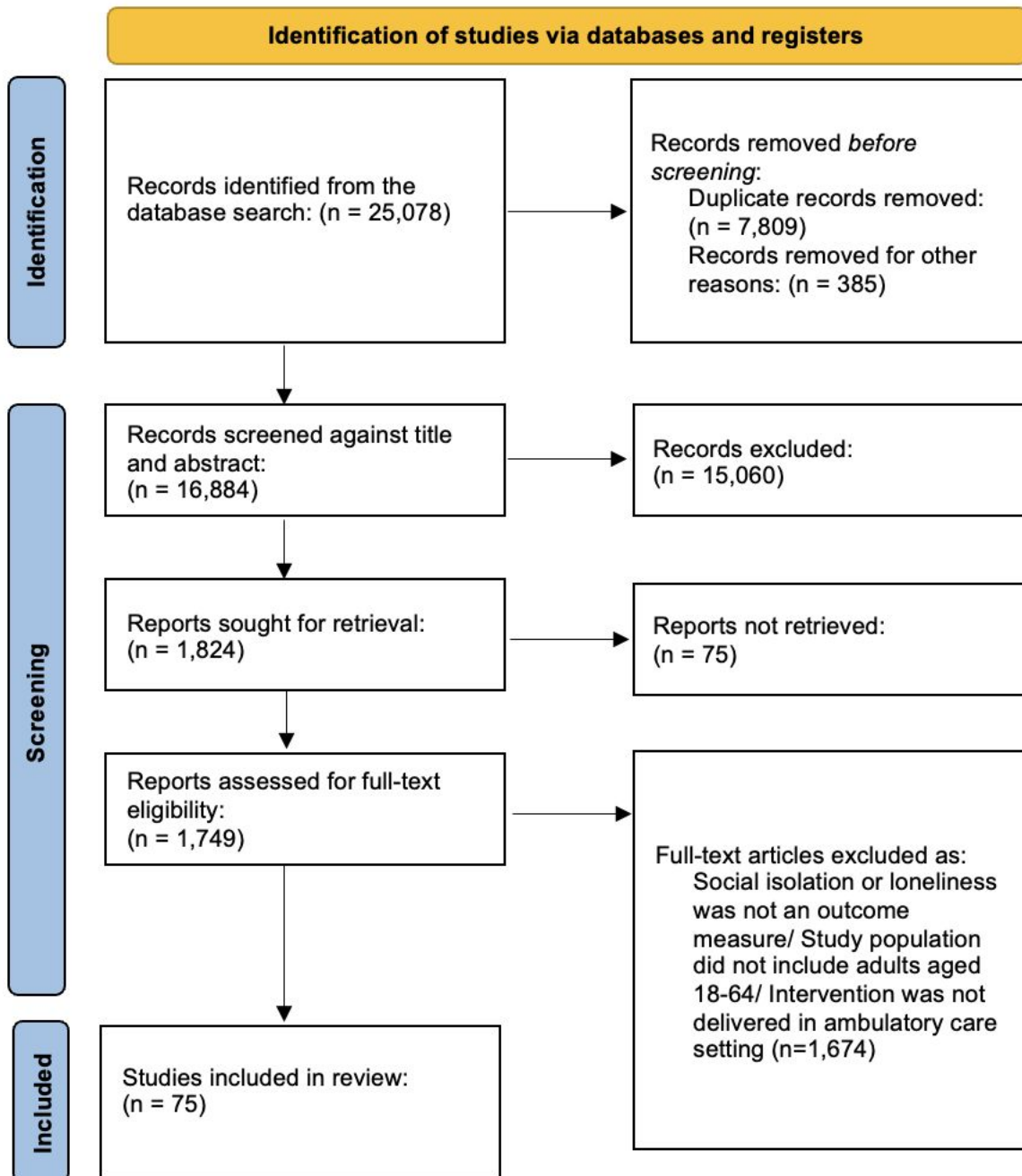


Figure 1. PRISMA study selection flow diagram

Accepted

Study characteristics

Study designs comprised 34 experimental studies,^{25–58} 20 observational studies,^{59–78} eight qualitative studies,^{79–86} and 13 mixed-methods studies.^{87–99} These articles were published from 1966 to 2023 inclusive.

Thirty-two studies were from the United States,^{25–27,29,31,34,38,39,42–44,47–49,52,55,59,64,66,67,69,73,75,78,81,86,88,93–95,99,100} nine from the UK,^{36,51,57,70,79,83,89,90,98} six from Canada,^{32,60,80,85,92,96} six from Australia,^{40,58,62,63,65,97} six from the Netherlands,^{28,33,37,56,77,87} three from Spain,^{68,74,76} one multi-centre study,⁵³ and one each from China,⁴⁶ the Czech Republic,⁶¹ Denmark,⁹¹ Iran,⁴⁵ Ireland,³⁵ Italy,⁸⁴ Japan,³⁰ Pakistan,⁸² Scotland,⁷² Singapore,⁴¹ Sweden,⁷¹ and Turkey.⁵⁴

Most of the included studies had a specific population of focus. Thirty studies (n=30, 40.0%) focused on individuals living with mental illnesses. These included individuals living with depression,^{32,38,41,51,59,66,82,88} social anxiety,^{34,40,44,66,88} psychotic disorder,^{62,63} schizophrenia,⁶¹ and other mental health conditions.^{33,35,37,43,48,49,56,60,69,73,78,79,89,90,93,97} Twenty-four studies (n=24, 32.0%) focused on people living with chronic illnesses, such as HIV/AIDS,^{27,31,52,80} breast cancer,^{29,30,42,55} lung cancer,⁴⁶ skin cancer,⁸⁷ multiple sclerosis,³⁹ type-1⁹¹ and type-2 diabetes,⁸¹ rheumatic diseases,²⁸ stroke,⁶⁴ aphasia,³⁶ Parkinson's disease,⁵³ heart disease,^{72,95} liver disease,⁷⁶ and multiple chronic conditions.^{58,70,83,85} Three studies (n=3, 4.0%) focused on individuals living with chronic pain.^{54,75,86} Five studies (n=5, 6.7%) focused on people living with a physical or intellectual disability.^{25,26,50,67,98} Two studies (n=2, 2.67) focused on individuals experiencing homelessness, including one study on homeless youth and another on women living in shelters.^{84,96} Only one study focused on a Native American population (n=1, 1.3%).⁴⁷ Please see [Supplementary Table 2](#) for the main characteristics of the included studies.

The following narrative synthesis categorizes studies by common intervention components (group versus individual interventions, intervention setting, and use of technology) and type (psychological, psycho-educational, leisure and exercise, healthcare delivery, social care, befriending interventions). For each component and intervention type, we also assessed the effectiveness of the interventions, highlighting quantitative or mixed-method studies that reported a significant positive effect on social isolation and/or loneliness measures or qualitative studies that reported an improvement in social isolation or loneliness, as well as those reporting mixed and unclear results (Table 2).

Intervention effectiveness according to intervention components

Group vs. individual interventions

A key finding was the effectiveness of group interventions, with over half (n=40, 53.3%) incorporating a group component,^{25–31,33,39,40,44,45,49–51,56,59,61,63–65,67–69,71,74,76–80,82,84,85,89–92,97,98} and the majority (n=27) yielding significant improvements in reducing loneliness and/or social isolation.^{25, 27–30,40,44,45,51,56,61,63,65,68,69,74,77,78,82,84,85,89–92,97,98} Individual interventions (n=21,

28.0%),^{32,35,36,38,41–43,46–48,53,54,57,58,62,66,70,73,75,83,95} were also notable, with 13 demonstrating effectiveness.^{38,42,43,46,47,53,62,66,70,73,75,83,95} Combined group and individual interventions (n=14, 18.7%),^{34,37,52,55,60,72,81,86–88,93,94,96,99} showed a split in effectiveness, with half reporting significant results.^{60,72,81,86,88,94,96}

Intervention setting

Most studies took place in healthcare settings (n=23, 30.7%), with those in community health or primary care centers showing the most effectiveness.^{38,56,60,61,63,70,74,81,83,86,88,89,92,97} Many effective interventions aimed to foster a network between primary care and specialists, as well as other community agencies. For example, one study aimed to strengthen the connection between primary care physicians and psychiatrists to prevent social isolation among individuals diagnosed with a schizophrenia-spectrum disorder.⁶¹

Nine studies (n=9, 12.0%) took place in outpatient clinics,^{28,30,39,55,61,64,75,76,91} of which six improved loneliness and/or social isolation outcomes.^{28,30,39,61,75,91}

Interventions set in community settings (n=18, 24.0%), including at a university psychology clinic,^{40,44,73} a daily care centre,⁶⁸ a senior service agency,⁷⁷ an arts organization,⁹⁰ a learning disability trust,⁹⁸ and other unspecified community settings,^{51,65,80,84,94} showed considerable effectiveness.

Two studies took place in the patient's home and featured a volunteer befriending and support service.^{72,57} Peardon et al. (2010) provided direct social support and regular open meetings between patients and caregivers.⁷² Patient feedback from open-ended questionnaires indicated a positive impact on social isolation.⁷² Walshe et al. (2016) provided a befriending intervention to patients eligible for end-of-life care.⁵⁷ The authors observed a slower decline in loneliness within the intervention group than the usual care group, although the difference was not statistically significant.⁵⁷

Sixteen studies (n=16, 21.3%) featured an intervention delivered virtually from the patient's home, of which only six were effective.^{25,27,42,43,85,95} Five studies were set across multiple settings (n=5, 6.7%).^{29,34,47,48,58} Two of these were effective, including one study which combined individual telephone and group support and education in a healthcare setting,²⁹ and another study which took place at a rural Chapter House, an urban church, and an urban Native American-serving federally qualified health center.^{29,47} Two studies showed no significant effect, including one randomized control trial that delivered caring text messages to healthcare providers, staff, and patients,^{48,58} and another that compared gym-based and home-based exercise with telephone support.⁵⁸ One study targeting adults with generalized social anxiety disorder provided meditation and Hatha yoga at a public health centre, with virtual at-home options, and reported mixed results.³⁴

Use of technology

Technology played a role in nearly a third of the interventions (n=21, 28.0%).^{25–27,29,31,32,37,42,43,48,50,52,58,67,80,83–85,94,95,97} Thirteen studies used a telephone- or videoconferencing-

based approach, ^{25-27,29,31,32,37,42,43,48,67,80,85} of which six were effective in reducing loneliness and/or social isolation measures. ^{25,27,29,42,43,85} All four studies that used a smartphone application were effective. These studies used smartphones to deliver videos modelling psychology concepts, ⁶² mindfulness training, ⁴³ psychosocial telehealth sessions, ⁹⁵ and daily psycho-educational messages to participants. ⁹⁴ Three studies used a computer-based approach. ³⁶ Of these, only one qualitative study featuring open-ended group meetings with women living in shelters was effective. One study used an internet forum to facilitate communication between volunteers and individuals diagnosed with a gambling disorder and reported significant improvements in loneliness from baseline to six months ($p=0.003$). ⁹⁷

Intervention effectiveness according to intervention type

Psychological interventions

Many studies ($n=39$, 52.0%) featured a psychological intervention that addressed the association between mental health and social isolation. Those using integrated cognitive-behavioural therapy (CBT) approaches ($n=13$, 17.3%) to challenge negative thoughts and reduce psychological distress, were most effective. ^{44,51,65,69,73,78,82,94,97} Other psychological interventions, including counselling ($n=9$, 12.0%), ²⁵, and peer support ($n=9$, 12.0%), ^{32,41,88,91-93,95,96}, demonstrated over fifty percent effectiveness. Peer support was effective in fostering social support for people living with Type-1 diabetes, ⁹¹ HIV/AIDS, ⁸⁸ homeless youth, ⁹⁶ and expectant mothers of babies diagnosed with congenital heart disease. ⁹⁵

Fewer studies examined the effectiveness of other psychological interventions such as mindfulness training ($n=3$, 4.0%), ^{34,43,44} didactic discussions ($n=2$, 2.7%), ^{88,93} art therapy ($n=2$, 2.7%), ^{89,90} and breath therapy ($n=1$, 1.3%). ⁹⁹ Both art therapy interventions were effective in reducing feelings of social isolation among participants. ^{89,90}

Psycho-educational interventions

Over half the studies ($n=39$, 52.0%) featured a psych-educational intervention. Of these, 40% ($n=30$) featured self-management and coping strategies, for people living with a chronic disease, ^{27,29-31,39,46,64,65,71,80,81,85-88,91,92,95} mental illness, ^{33,40,56,60-62,66,78,93,97} severe disability, ⁵⁰ and those facing homelessness. ⁹⁶ Most of these studies ($n=21$) were effective. ^{27,29,30,40,51,56,60,61,63,65,66,78,81,85,86,88,91,92,95-97} Nine studies ($n=9$, 12.0%) focused on enhancing self-efficacy through strategies like goal setting, problem-solving, and communication skill development, ^{28,33,36,39,45,63,77,92,94} achieving effectiveness in six of the studies. ^{28,45,63,77,92,94}

Leisure and exercise interventions

Leisure and exercise-based interventions, although fewer ($n=4$), were largely effective ($n=3$). ^{47,58,65} Bea et al. (2023) examined the feasibility of a culturally tailored exercise program on cancer-risk biomarkers and quality of life among Native American cancer survivors and reported improvements in isolation subscale scores across cohorts ($p<0.05$). ⁴⁷ Deans et al. (2021) incorporated a one-hour group physical activity session, noting a significant reduction in average UCLA-Loneliness scores between the program's start and the post-program assessment ($p <$

0.005).⁶⁵ Garcia et al. (2003) featured leisure-based weekly activity workshops involving gymnastics, computer science, and arts and found significant decreases in loneliness scores ($p < 0.01$).⁶⁸

Healthcare delivery interventions

Six studies ($n=6$, 8.0%) delivered specialized healthcare services to patients to improve social isolation and loneliness. Interventions included home-based health services for individuals living with HIV/AIDS,⁵² mental health care,³⁷ ultrasound therapy for cervical myofascial pain syndrome,⁵⁴ acupuncture,^{70,75} and carbidopa medication for individuals with Parkinson's Disease.⁵³ Acupuncture services delivered through primary care was shown to effectively reduce social isolation and loneliness among primary living with chronic pain and chronic diseases.^{53,70,75}

Social care interventions

All three studies ($n=3$, 4.0%) that integrated action on social determinants of health were effective. Wildman et al. (2019) investigated the experiences of patients with long-term conditions utilizing a social prescribing service within primary care in a socioeconomically deprived region of Northeast England. The authors found decreased levels of social isolation per self-report.⁸³ Petryshen et al. (2001) implemented a multi-level intervention featuring an environmental change initiative to support a community mental health program.⁶⁰ Participants reported statistically significant lower levels of loneliness at one-year follow-up.⁶⁰ Coll-Planas et al. (2015) implemented a coordinated action strategy which involved building a network between primary healthcare centres, senior centres, and other community assets where older people could participate in activities.⁷⁴ The long-term impact evaluation showed that loneliness had reduced significantly ($p < 0.001$).⁷⁴

Befriending intervention

Befriending interventions ($n=3$, 4.0%), for patients in their last year of life,^{35,57,72} those living with chronic heart failure,⁷² and individuals with a serious mental illness³⁵ had mixed results. Only one observational study by Peardon et al. (2010) demonstrated a significant positive effect.⁷²

Table 2: Synthesis of intervention effectiveness according to intervention component and type

Intervention component and type	No. of studies (%)	Quantitative studies with a significant positive effect or qualitative studies reporting improvement in social isolation or loneliness	Studies with no significant effect	Studies with mixed results	Studies with unclear results
Group vs individual					
<i>Group</i>	40 (53.3)	(25, 27–30,40,44,45,51,56,61,63,65,68,69,74,77,78,82,84,85,89–92,97,98 (n=27, 67.5)	33,64,67,71,76 (n=5, 12.5)	31,39,59,80 (n=4, 10.0)	26,49,50,79 (n=4, 10.0)
<i>Individual</i>	21 (28.0)	38,42,43,46,47,53,62,66,70,73,75,83,95 (n=13, 61.9)	32,36,41,48,54,57,58 (n=7, 33.3)	35 (n=1, 4.7)	
<i>Both</i>	14 (18.7)	60,72,81,86,88,94,96 (n=7, 50.0)	37,52,55,87,93 (n=5, 35.7)	34 (n=1, 7.1)	99 (n=1, 7.1)
Intervention setting					
Healthcare setting	23 (30.7)				
<i>Community or primary healthcare centres</i>	14 (18.7)	29,38,56,60, 61, 63,70,74,81,83,88,89,92,97 (n=14, 100.0)			
<i>Outpatient clinics</i>	9 (12.0)	(28,30,39,61,75,91 (n=6, 66.7)	55,64,76 (n=3, 33.3)		
Community setting	18 (24.0)				
<i>Community organizations, service agencies, university psychology clinics etc.</i>	16 (21.3)	40,44,51,65,68,73,77,80,84,90,94,98 (n=12, 75.0)	35,71,93 (n=3, 18.7)		79 (n=1, 6.2)
<i>Patient's home</i>	2 (2.7)	72 (n=1, 50.0)	57 (n=1, 50.0)		
Virtual (patient's home)	16 (21.3)	25, 27,42,43,85,95 n=6, 37.5)	32,36,37,41,52,62,67,80 (n=8, 50.0)	26,31 (n=2, 12.5)	
Multiple settings	5 (6.7)	29,47 (n=2, 40.0)	48,58 (n=2, 40.0)	34 (n=1, 20.0)	
Use of technology					
Used technology	21 (28.0)				
<i>Telephone or videoconferencing</i>	13 (17.3)	25,27,29,42,43,85 (n=6, 46.1)	31,32,37,48,80 (n=5, 38.5)		26,67 (n=2, 15.4)
<i>Smartphone application</i>	4 (5.3)	43,62,94,95 (n=4, 100.0)			
<i>Computer-based</i>	3 (4.0)	84 (n=1, 33.3)	36,52 (n=2, 66.7)		
<i>Internet forum</i>	1 (1.3)	97 (n=1, 100.0)			

Intervention type					
Psychological interventions	39 (52.0)				
<i>CBT</i>	13 (17.3)	44,51,65,69,73,78,82,94,97 (n=9, 69.2)	55,76 (n=2, 15.4)	26,59 (n=2, 15.4)	
<i>Counselling</i>	9 (12.0)	25, 38,42,84,98 (n=5, 55.6)	67,87 (n=2, 22.2)		49,50(n=2, 22.2)
<i>Peer support</i>	9 (12.0)	88,91,92,95,96(n=5, 55.5)	32,41,93 (n=3, 33.4)		80 (n=1, 11.1)
<i>Mindfulness training</i>	3 (4.0)	43,44 (n=2, 66.7)		34 (n=1, 33.3)	
<i>Didactic discussion</i>	2 (2.7)	88 (n=1, 50.0)	93 (n=1, 50.0)		
<i>Art therapy</i>	2 (2.7)	89,90 (n=2, 100.0)			
<i>Breath therapy</i>	1 (1.3)				99 (n=1, 100.0)
Psycho-educational interventions	39 (52.0)				
<i>Disease self-management and coping strategies</i>	30 (40.0)	27,29,30,40,51,56,60,61,63,65,66,78, 81,85,86,88,91,92,95-97 (n=21, 70.00)	33,64,71,87,93 (n=5, 16.7)	31,39,46,80 (n=4, 13.3)	
<i>Enhancing self-efficacy via learning goal setting, problem-solving, and communication skills</i>	9 (12.0)	28,45,63,77,92,94 (n=6, 66.7)	33,36 (n=2, 22.2)	39 (n=1, 11.1)	
Leisure & exercise interventions	4 (5.3)				
<i>Exercise-based intervention</i>	3 (4.0)	47,65 (n=2, 66.7)	58 (n=1, 33.3)		
<i>Leisure</i>	1 (1.3)	68 (n=1, 100.0)			
Healthcare delivery intervention	6 (8.0)	53,70,75 (n=3, 50.0)	48,54 (n=2, 33.3)		79
Social care intervention	3 (4.0)	60,74,83 (n=3, 100.0)			
Befriending intervention	3 (4.0)	72 (n=1, 33.3)	57 (n=1, 33.3)	35 (n=1, 33.3)	

NOTE: multiple intervention components and types were considered in some studies.

Quality appraisal

We assigned each study an overall quality rating of “low risk”, “high risk” or “some concerns” of bias based on the results of the quality assessment. Fifteen studies had low risk of bias (n=15, 20%), 12 had a high risk of bias (16%) and 48 studies had some concerns of bias (64%). For quality appraisal of literature and risk of bias findings see [Supplementary Table 3](#).

Discussion

Summary

Our findings indicate that group interventions, delivered in primary care and community health centres, are effective in reducing social isolation and loneliness. Digital technologies, particularly telephone or videoconferencing and smartphone applications, enhance flexibility and efficacy of interventions. Effective interventions also focused on addressing mental health

through CBT-based psychological interventions. Peer support and counselling also played a key role in enhancing social support and social integration. Psycho-educational interventions focusing on self-management for chronic conditions also showed effectiveness in social isolation and loneliness outcome measures.

Strengths and limitations

This review fills a gap in the existing literature by examining social isolation interventions targeting community-dwelling adults below the age of 65 in ambulatory healthcare settings. Our comprehensive search strategy and inclusion criteria ensured that we captured extensive literature pertinent to the subject, covering a wide range of study designs. To ensure that quality appraisal was appropriate to the study methodology, we used four previously validated quality appraisal tools appropriate for the four distinct study designs in this review.

Limitations include the poor quality of some studies, and the variability in measurement tools, notably self-report measures prone to bias, which can affect the assessment of intervention effectiveness. Furthermore, while our review included a variety of sub-populations, ages 18-64, the focus on specific groups in most interventions may limit the generalizability of our findings.

Comparison with existing literature

Most research in social isolation interventions has focused on older populations. Many reviews have focused on the effectiveness of digital technologies,^{102–104} especially considering the periods of mandated social isolation during the COVID-19 pandemic.¹⁰⁵ A recent meta-review of social prescription interventions for older adults found that group interventions, particularly those incorporating peer support, were effective in reducing social isolation and loneliness among migrants and individuals living with a disability.¹⁰⁶

Reviews on social isolation interventions for adults under 65 are limited. Similar to our findings, one systematic review found that technology and support groups are important in reducing loneliness among non-elderly adults.¹⁰⁷ Masi et al. (2011) found that group-based interventions bolster social contact and support, while technology-based programs address maladaptive therapy and increase social support.¹⁰⁸ Osborn et al. (2019) found interventions in institutional environments like educational and healthcare settings particularly effective for young people.¹⁰⁹

Primary care settings are amenable to leveraging social isolation as a target of intervention, owing to their unique niche as the ‘patient medical home’ and the potential for integrating multidisciplinary care. Few reviews have focused on interventions implemented specifically in primary care settings, and none identified have been on adults under 65 years old.^{106,110} A recent scoping review by Galvez-Hernandez and colleagues (2022) showed that despite the growing collaboration between primary care and non-healthcare sectors, more effort should be made to tailor interventions to older adults’ social needs and to design long-lasting interventions that foster meaningful social networks.¹⁸

The COVID-19 pandemic has exposed larger segments of the population to the risk of social isolation and loneliness, underscoring the need for interventions among the wider public. A

systematic review of interventions compatible with social distancing measures found that effective interventions integrated psychological therapies, social skill building, and social facilitation.¹¹¹ However, few interventions improved social isolation. Understanding varied experiences of loneliness and isolation during the pandemic is needed.¹¹¹

Implications for research and practice

We identified few studies aimed at populations made vulnerable by social and economic policies. This includes those living in low- and middle-income countries, where the prevalence of social isolation is on par with or higher than in high-income countries.¹⁶ Additionally, individuals from racialized communities and those with fewer educational opportunities face a greater risk of social isolation and loneliness.^{112–115} Future research should focus on these groups with culturally sensitive and age-specific interventions to meet their unique needs.

Further research is also needed on the role of the primary care in addressing social isolation. Integrating social isolation interventions in these settings enables practitioners to simultaneously address patients' immediate health concerns and underlying social determinants, such as homelessness.¹⁸ As a space for social support and community resources, primary care can play a larger role in effectively identifying and mitigating social isolation.

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References

1. Elovainio M, Hakulinen C, Pulkki-Råback L, et al. Contribution of risk factors to excess mortality in isolated and lonely individuals: an analysis of data from the UK Biobank cohort study. *Lancet Public Health*. 2017;2(6):e260. doi:10.1016/S2468-2667(17)30075-0
2. Laugesen K, Baggesen LM, Schmidt SAJ, et al. Social isolation and all-cause mortality: a population-based cohort study in Denmark. *Sci Rep*. 2018;8(1). doi:10.1038/S41598-018-22963-W
3. Tanskanen J, Anttila T. A Prospective Study of Social Isolation, Loneliness, and Mortality in Finland. *Am J Public Health*. 2016;106(11):2042. doi:10.2105/AJPH.2016.303431
4. Yu B, Steptoe A, Chen LJ, Chen YH, Lin CH, Ku PW. Social Isolation, Loneliness, and All-Cause Mortality in Patients With Cardiovascular Disease: A 10-Year Follow-up Study. *Psychosom Med*. 2020;82(2):208-214. doi:10.1097/PSY.0000000000000777
5. Manemann SM, Chamberlain AM, Roger VL, et al. Perceived Social Isolation and Outcomes in Patients With Heart Failure. *J Am Heart Assoc*. 2018;7(11). doi:10.1161/JAHA.117.008069
6. Lee H, Singh GK. Social Isolation and All-Cause and Heart Disease Mortality Among Working-Age Adults in the United States: The 1998-2014 NHIS-NDI Record Linkage Study. *Health Equity*. 2021;5(1):750-761. doi:10.1089/HEQ.2021.0003
7. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspect Psychol Sci*. 2015;10(2):227-237. doi:10.1177/1745691614568352
8. Freak-Poli R, Ryan J, Neumann JT, et al. Social isolation, social support and loneliness as predictors of cardiovascular disease incidence and mortality. *BMC Geriatr*. 2021;21(1). doi:10.1186/S12877-021-02602-2
9. Golaszewski NM, Lacroix AZ, Godino JG, et al. Evaluation of Social Isolation, Loneliness, and Cardiovascular Disease Among Older Women in the US. *JAMA Netw Open*. 2022;5(2). doi:10.1001/JAMANETWORKOPEN.2021.46461
10. Pietrabissa G, Simpson SG. Psychological Consequences of Social Isolation During COVID-19 Outbreak. *Front Psychol*. 2020;11:2201. doi:10.3389/FPSYG.2020.02201
11. Holt-Lunstad J, Smith TB, Layton JB. Social Relationships and Mortality Risk: A Meta-analytic Review. *PLoS Med*. 2010;7(7):e1000316. doi:10.1371/JOURNAL.PMED.1000316
12. Hoang P, King JA, Moore S, et al. Interventions Associated With Reduced Loneliness and Social Isolation in Older Adults: A Systematic Review and Meta-analysis. *JAMA Netw Open*. 2022;5(10):e2236676-e2236676. doi:10.1001/JAMANETWORKOPEN.2022.36676
13. Fried L, Prohaska T, Burholt V, et al. A unified approach to loneliness. *The Lancet*. 2020;395(10218):114. doi:10.1016/S0140-6736(19)32533-4
14. Loneliness and Social Isolation in the United States, the United Kingdom, and Japan: An International Survey | KFF. Accessed December 17, 2023.

- <https://www.kff.org/mental-health/report/loneliness-and-social-isolation-in-the-united-states-the-united-kingdom-and-japan-an-international-survey/>
15. Christiansen J, Qualter P, Friis K, et al. Associations of loneliness and social isolation with physical and mental health among adolescents and young adults. <https://doi.org/10.1177/17579139211016077>. 2021;141(4):226-236. doi:10.1177/17579139211016077
 16. WHO Commission on Social Connection. Accessed January 4, 2024. <https://www.who.int/groups/commission-on-social-connection>
 17. Na PJ, Jeste D V., Pietrzak RH. Social Disconnection as a Global Behavioral Epidemic—A Call to Action About a Major Health Risk Factor. *JAMA Psychiatry*. 2023;80(2):101-102. doi:10.1001/JAMAPSYCHIATRY.2022.4162
 18. Galvez-Hernandez P, González-De Paz L, Muntaner C. Primary care-based interventions addressing social isolation and loneliness in older people: a scoping review. *BMJ Open*. 2022;12(2):e057729. doi:10.1136/BMJOPEN-2021-057729
 19. Thompson C, Halcomb E, Masso M. The contribution of primary care practitioners to interventions reducing loneliness and social isolation in older people—An integrative review. *Scand J Caring Sci*. 2023;37(3):611-627. doi:10.1111/SCS.13151
 20. Primary care. Accessed December 15, 2023. <https://www.who.int/teams/integrated-health-services/clinical-services-and-systems/primary-care>
 21. Evidence Partners. DistillerSR. <https://www.evidencepartners.com/>
 22. Kennedy CE, Spaulding AB, Brickley DB, et al. Linking sexual and reproductive health and HIV interventions: A systematic review. *J Int AIDS Soc*. 2010;13(1):1-10. doi:10.1186/1758-2652-13-26/TABLES/2
 23. CASP Checklists - Critical Appraisal Skills Programme. Accessed May 24, 2023. <https://casp-uk.net/casp-tools-checklists/>
 24. Hong Q, Pluye P, Fàbregues S, et al. MIXED METHODS APPRAISAL TOOL (MMAT) VERSION 2018. Published online 2018.
 25. Evans RL, Werkhoven W, Fox HR. Treatment of Social Isolation and Loneliness in a Sample of Visually Impaired Elderly Persons. <http://dx.doi.org/102466/pr01982511103>. 1982;51(1):103-108. doi:10.2466/PR0.1982.51.1.103
 26. Evans RL, Smith KM, Werkhoven WS, Fox HR, Pritzl DO. Cognitive telephone group therapy with physically disabled elderly persons. *Gerontologist*. 1986;26(1):8-11. doi:10.1093/GERONT/26.1.8
 27. Rounds KA, Galinsky MJ, Despard MR. Evaluation of Telephone Support Groups for Persons With HIV Disease. *Res Soc Work Pract*. 1995;5(4):442-459. doi:10.1177/104973159500500405
 28. Savelkoul M, De Witte LP, Candel MJJM, Van Tempel H Der, Van Borne B Den. Effects of a coping intervention on patients with rheumatic diseases: results of a randomized controlled trial. *Arthritis Rheum*. 2001;45(1):69-76. doi:10.1002/1529-0131(200102)45:1<69::aid-anr86>3.0.co;2-m
 29. Samarel N, Tulman L, Fawcett J. Effects of two types of social support and education on adaptation to early-stage breast cancer. *Res Nurs Health*. 2002;25(6):459-470. doi:10.1002/NUR.10061

30. Fukui S, Koike M, Ooba A, Uchitomi Y. The Effect of a Psychosocial Group Intervention on Loneliness and Social Support for Japanese Women With Primary Breast Cancer. *Number 5 /2003*. 2007;30(5):823-830. doi:10.1188/03.ONF.823-830
31. Heckman TG, Barcikowski R, Ogles B, et al. A telephone-delivered coping improvement group intervention for middle-aged and older adults living with HIV/AIDS. *Ann Behav Med*. 2006;32(1):27-38. doi:10.1207/S15324796ABM3201_4
32. Dennis CL, Hodnett E, Kenton L, et al. Effect of peer support on prevention of postnatal depression among high risk women: multisite randomised controlled trial. *BMJ*. 2009;338(7689):280-283. doi:10.1136/BMJ.A3064
33. van Gestel-Timmermans J, Brouwers E, van Assen M, van Nieuwenhuizen C. Effects and feasibility of a peer-run course on the recovery of people with major psychiatric problems: a randomised controlled trial and feasibility study. *Psychiatr Prax*. 2011;38(S 01). doi:10.1055/S-0031-1277755
34. Jazaieri H, Goldin PR, Werner K, Ziv M, Gross JJ. A randomized trial of MBSR versus aerobic exercise for social anxiety disorder. *J Clin Psychol*. 2012;68(7):715-731. doi:10.1002/JCLP.21863
35. Sheridan AJ, Drennan J, Coughlan B, et al. Improving social functioning and reducing social isolation and loneliness among people with enduring mental illness: Report of a randomised controlled trial of supported socialisation. *Int J Soc Psychiatry*. 2015;61(3):241-250. doi:10.1177/0020764014540150
36. Marshall J, Booth T, Devane N, et al. Evaluating the Benefits of Aphasia Intervention Delivered in Virtual Reality: Results of a Quasi-Randomised Study. *PLoS One*. 2016;11(8). doi:10.1371/JOURNAL.PONE.0160381
37. Hulsbosch AM, Nugter MA, Tamis P, Kroon H. Videoconferencing in a mental health service in The Netherlands: A randomized controlled trial on patient satisfaction and clinical outcomes for outpatients with severe mental illness. *J Telemed Telecare*. 2017;23(5):513-520. doi:10.1177/1357633X16650096
38. Duberstein PR, Ward EA, Chaudron LH, et al. Effectiveness of interpersonal psychotherapy-trauma for depressed women with childhood abuse histories. *J Consult Clin Psychol*. 2018;86(10):868-878. doi:10.1037/CCP0000335
39. Tamar Kalina J, Hinojosa J, Strober L, Bacon J, Donnelly S, Goverover Y. Randomized Controlled Trial to Improve Self-Efficacy in People With Multiple Sclerosis: The Community Reintegration for Socially Isolated Patients (CRISP) Program. *Am J Occup Ther*. 2018;72(5). doi:10.5014/AJOT.2018.026864
40. Haslam C, Cruwys T, Chang MXL, et al. GROUPS 4 HEALTH reduces loneliness and social anxiety in adults with psychological distress: Findings from a randomized controlled trial. *J Consult Clin Psychol*. 2019;87(9):787-801. doi:10.1037/CCP0000427
41. Shorey S, Chee CYI, Ng ED, Lau Y, Dennis CL, Chan YH. Evaluation of a Technology-Based Peer-Support Intervention Program for Preventing Postnatal Depression (Part 1): Randomized Controlled Trial. *J Med Internet Res*. 2019;21(8). doi:10.2196/12410
42. Badger TA, Segrin C, Sikorskii A, et al. Randomized controlled trial of supportive care interventions to manage psychological distress and symptoms in Latinas with breast cancer and their informal caregivers. *Psychol Health*. 2020;35(1):87-106. doi:10.1080/08870446.2019.1626395

43. Lindsay EK, Young S, Brown KW, Smyth JM, David Creswell J. Mindfulness training reduces loneliness and increases social contact in a randomized controlled trial. *Proc Natl Acad Sci U S A*. 2019;116(9):3488-3493. doi:10.1073/PNAS.1813588116
44. O'Day EB, Butler RM, Morrison AS, Goldin PR, Gross JJ, Heimberg RG. Reductions in social anxiety during treatment predict lower levels of loneliness during follow-up among individuals with social anxiety disorder. *J Anxiety Disord*. 2021;78. doi:10.1016/J.JANXDIS.2021.102362
45. Mahmoudpour A, Rayesh N, Ghanbarian E, Rezaee M. Effectiveness of acceptance and commitment therapy (ACT) on emotional regulation and loneliness of divorced women in Iran. *J Marital Fam Ther*. 2021;47(4):831-842. doi:10.1111/JMFT.12492
46. Lin SS, Lin ZL. Effects of Perioperative Psychological Reinforcement Intervention on Negative Emotion and Quality of Life in Lung Cancer Patients. *Indian J Pharm Sci*. 2021;0(0):224-229. doi:10.36468/PHARMACEUTICAL-SCIENCES.SPL.354
47. Bea JW, de Heer H 'Dirk,' Lane T, et al. Restoring Balance: a physical activity intervention for Native American cancer survivors and their familial support persons. *Exercise, sport, & movement*. 2023;1(2). doi:10.1249/ESM.0000000000000007
48. Radin AK, Shaw J, Brown SP, et al. Comparative effectiveness of two versions of a caring contacts intervention in healthcare providers, staff, and patients for reducing loneliness and mental distress: A randomized controlled trial. *J Affect Disord*. 2023;331:442-451. doi:10.1016/J.JAD.2023.03.029
49. Frey DH, Motto JA, Ritholz MD. GROUP THERAPY FOR PERSONS AT RISK FOR SUICIDE: AN EVALUATION USING THE INTENSIVE DESIGN 1. *PSYCHOTHERAPY: THEORY, RESEARCH AND PRACTICE*. 1983;20.
50. Predicting outcome of group counseling with severely disabled patients - PubMed. Accessed May 31, 2023. <https://pubmed.ncbi.nlm.nih.gov/3155916/>
51. A 3-year follow-up of a cognitive-behavioral therapy intervention - PubMed. Accessed May 31, 2023. <https://pubmed.ncbi.nlm.nih.gov/3178300/>
52. Flatley-Brennan P. Computer network home care demonstration: a randomized trial in persons living with AIDS. *Comput Biol Med*. 1998;28(5):489-508. doi:10.1016/S0010-4825(98)00029-8
53. Koller WC, Hutton JT, Tolosa E, Capildeo R. Immediate-release and controlled-release carbidopa/levodopa in PD: A 5- year randomized multicenter study. *Neurology*. 1999;53(5):1012-1019. doi:10.1212/WNL.53.5.1012
54. Dündar Ü, Solak Ö, Şamli F, Kavuncu V. Effectiveness of Ultrasound Therapy in Cervical Myofascial Pain Syndrome: A Double Blind, Placebo-Controlled Study. *Arch Rheumatol*. 2010;25(3):110-115. doi:10.5152/TJR.2010.13
55. Dodds SE, Pace TWW, Bell ML, et al. Feasibility of Cognitively-Based Compassion Training (CBCT) for breast cancer survivors: a randomized, wait list controlled pilot study. *Supportive Care in Cancer*. 2015;23(12):3599-3608. doi:10.1007/S00520-015-2888-1/METRICS
56. Boevink W, Kroon H, van Vugt M, Delespaul P, van Os J. A user-developed, user run recovery programme for people with severe mental illness: A randomised control trial. <http://dx.doi.org/101080/1752243920161172335>. 2016;8(4):287-300. doi:10.1080/17522439.2016.1172335

57. Walshe C, Dodd S, Hill M, et al. How effective are volunteers at supporting people in their last year of life? A pragmatic randomised wait-list trial in palliative care (ELSA). *BMC Med.* 2016;14(1). doi:10.1186/S12916-016-0746-8
58. Jansons P, Robins L, O'Brien L, Haines T. Gym-based exercise and home-based exercise with telephone support have similar outcomes when used as maintenance programs in adults with chronic health conditions: a randomised trial. *J Physiother.* 2017;63(3):154-160. doi:10.1016/J.JPHYS.2017.05.018
59. Zust BL. Effect of cognitive therapy on depression in rural, battered women. *Arch Psychiatr Nurs.* 2000;14(2):51-63. doi:10.1016/S0883-9417(00)80020-5
60. Petryshen PM, Hawkins JD, Fronchak TA. An evaluation of the social recreation component of a community mental health program. *Psychiatr Rehabil J.* 2001;24(3):293-298. doi:10.1037/H0095083
61. Bankovska Motlova L, Dragomirecka E, Kitzlerova E. Weight control programme for schizophrenia: Bridge between psychiatrists and primary care physicians. *European Psychiatry.* 2009;24(7):490-491. doi:10.1016/J.EURPSY.2009.09.004
62. Lim MH, Gleeson JFM, Rodebaugh TL, et al. A pilot digital intervention targeting loneliness in young people with psychosis. *Soc Psychiatry Psychiatr Epidemiol.* 2020;55(7):877-889. doi:10.1007/S00127-019-01681-2
63. Lim MH, Penn DL, Thomas N, Gleeson JFM. Is loneliness a feasible treatment target in psychosis? *Soc Psychiatry Psychiatr Epidemiol.* 2020;55(7):901-906. doi:10.1007/S00127-019-01731-9/METRICS
64. Theeke LA, Mallow JA, Theeke E. A Pilot One Group Feasibility, Acceptability, and Initial Efficacy Trial of LISTEN for Loneliness in Lonely Stroke Survivors. *SAGE Open Nurs.* 2021;7. doi:10.1177/23779608211015154
65. Deans CL. Exploring the impact of a large gender-sensitised health promotion program: the Sons of the West program. *Public Health Res Pract.* 2021;31(1). doi:10.17061/PHRP30012001
66. Southward MW, Terrill DR, Sauer-Zavala S. The effects of the Unified Protocol and Unified Protocol skills on loneliness in the COVID-19 pandemic. *Depress Anxiety.* 2022;39(12):913. doi:10.1002/DA.23297
67. Evans RL, Smith KM, Halar EM, Kiolet CL. Effect of expectation and level of adjustment on treatment outcome. *Psychol Rep.* 1985;57(3 I):936-938. doi:10.2466/PR0.1985.57.3.936
68. García MÁ, Gómez L. Efectos de los talleres de ocio sobre el bienestar subjetivo y la soledad en las personas mayores. *Rev Psicol Soc.* 2003;18(1):35-47. doi:10.1174/02134740360521769
69. Sorenson DS. Healing traumatizing provider interactions among women through short-term group therapy. *Arch Psychiatr Nurs.* 2003;17(6):259-269. doi:10.1053/j.apnu.2003.10.002
70. Harborow PW, Ogden J. The effectiveness of an acupuncturist working in general practice--an audit. *Acupuncture in medicine : journal of the British Medical Acupuncture Society.* 2004;22(4):214-220. doi:10.1136/AIM.22.4.214
71. Dellve L, Samuelsson L, Tallborn A, Fasth A, Hallberg LRM. Stress and well-being among parents of children with rare diseases: a prospective intervention study. *J Adv Nurs.* 2006;53(4):392-402. doi:10.1111/J.1365-2648.2006.03736.X

72. Peardon L, Yellowlees D, Pratt R, et al. The use of innovative methods designed to relieve social isolation in patients with chronic heart failure; volunteer befriending, forums and a newsletter. *European journal of cardiovascular nursing*. 2010;9(3):181-187. doi:10.1016/J.EJCNURSE.2009.12.001
73. Seavey A, Moore TM. Schema-Focused Therapy for Major Depressive Disorder and Personality Disorder. <http://dx.doi.org/10.1177/1534650112460571>. 2012;11(6):457-473. doi:10.1177/1534650112460571
74. Coll-Planas L, del Valle Gómez G, Bonilla P, Masat T, Puig T, Monteserin R. Promoting social capital to alleviate loneliness and improve health among older people in Spain. *Health Soc Care Community*. 2017;25(1):145-157. doi:10.1111/HSC.12284
75. Davis RT, Badger G, Valentine K, Cavert A, Coeytaux RR. Acupuncture for Chronic Pain in the Vermont Medicaid Population: A Prospective, Pragmatic Intervention Trial. *Glob Adv Health Med*. 2018;7. doi:10.1177/2164956118769557
76. Febrero B, Ramírez P, Martínez-Alarcón L, et al. Quality of Life and Group Psychological Intervention in Patients With Cirrhosis on Liver Transplant Waiting List. *Transplant Proc*. 2018;50(9):2626-2629. doi:10.1016/J.TRANSProceed.2018.04.013
77. Martina CMS, Stevens NL, Westerhof GJ. Change and stability in loneliness and friendship after an intervention for older women. *Ageing Soc*. 2018;38(3):435-454. doi:10.1017/S0144686X16001008
78. Schoenleber M, Gratz KL. Self-Acceptance Group Therapy: A Transdiagnostic, Cognitive-Behavioral Treatment for Shame. *Cogn Behav Pract*. 2018;25(1):75-86. doi:10.1016/J.CBPRA.2017.05.002
79. Hamilton MW, Hoenig J. The impact of an extra-mural service on social isolation. *Social Psychiatry*. 1966;1(2):97-102. doi:10.1007/BF00583956/METRICS
80. Stewart MJ, Hart G, Mann K, Jackson S, Langille L, Reidy M. Telephone support group intervention for persons with hemophilia and HIV/AIDS and family caregivers. *Int J Nurs Stud*. 2001;38(2):209-225. doi:10.1016/S0020-7489(00)00035-3
81. Knox L, Huff J, Graham D, et al. What Peer Mentoring Adds to Already Good Patient Care: Implementing the Carpeta Roja Peer Mentoring Program in a Well-Resourced Health Care System. *Ann Fam Med*. 2015;13(Suppl 1):S59. doi:10.1370/AFM.1804
82. Husain N, Chaudhry N, Furber C, et al. Group psychological intervention for maternal depression: A nested qualitative study from Karachi, Pakistan. *World J Psychiatry*. 2017;7(2):98. doi:10.5498/WJP.V7.I2.98
83. Wildman JM, Moffatt S, Steer M, Laing K, Penn L, O'Brien N. Service-users' perspectives of link worker social prescribing: A qualitative follow-up study. *BMC Public Health*. 2019;19(1):1-12. doi:10.1186/S12889-018-6349-X/TABLES/1
84. Marzana D, Martinez-Damia S, Gaboardi M, Scollato A, Marta E. "The group gives me strength": A group-based intervention to promote trust and social connectedness among women experiencing homelessness. *J Community Appl Soc Psychol*. 2023;33(4):807-823. doi:10.1002/CASP.2683/SUPINFO
85. Marziali E. E-health program for patients with chronic disease. *Telemed J E Health*. 2009;15(2):176-181. doi:10.1089/TMJ.2008.0082
86. Bruns EB, Befus D, Wismer B, et al. Vulnerable Patients' Psychosocial Experiences in a Group-Based, Integrative Pain Management Program. *Journal of Alternative and Complementary Medicine*. 2019;25(7):719. doi:10.1089/ACM.2019.0074

87. Phase II Study of Psychotherapeutic Intervention in Advanced Cancer - De Vries - 1997 - Psycho-Oncology - Wiley Online Library. Accessed May 30, 2023. [https://onlinelibrary.wiley.com/doi/10.1002/\(SICI\)1099-1611\(199706\)6:2%3C129::AID-PON264%3E3.0.CO;2-U](https://onlinelibrary.wiley.com/doi/10.1002/(SICI)1099-1611(199706)6:2%3C129::AID-PON264%3E3.0.CO;2-U)
88. Reisner SL, O’Cleirigh C, Hendriksen ES, et al. “40 & Forward”: Preliminary Evaluation of a Group Intervention to Improve Mental Health Outcomes and Address HIV Sexual Risk Behaviors Among Older Gay and Bisexual Men. <http://dx.doi.org/101080/105387202011611113>. 2011;23(4):523-545. doi:10.1080/10538720.2011.611113
89. Van De Venter E, Buller AM. Arts on referral interventions: a mixed-methods study investigating factors associated with differential changes in mental well-being. *J Public Health (Oxf)*. 2015;37(1):143-150. doi:10.1093/PUBMED/FDU028
90. Allan J, Barford H, Horwood F, Stevens J, Tanti G. ATIC: Developing a recovery-based art therapy practice. <http://dx.doi.org/101080/174548322014968597>. 2015;20(1):14-27. doi:10.1080/17454832.2014.968597
91. Joensen LE, Andersen MM, Jensen S, Nørgaard K, Willaing I. The effect of peer support in adults with insulin pump-treated type 1 diabetes: a pilot study of a flexible and participatory intervention. *Patient Prefer Adherence*. 2017;11:1879-1890. doi:10.2147/PPA.S142204
92. Henteleff A, Wall H. The HANS KAI Project: a community-based approach to improving health and well-being through peer support. *Health Promot Chronic Dis Prev Can*. 2018;38(3):135-146. doi:10.24095/HPCDP.38.3.04
93. Mulry C, Gardner J, Swarbrick M, et al. Feasibility of the Let’s Go Mobility Program for Community Dwelling Adults with Mental Disorders. *Occup Ther Ment Health*. 2020;36(4):307-329. doi:10.1080/0164212X.2020.1825151
94. LeBlanc NJ. Building Social Connections: Testing the Efficacy of Two Brief Cognitive-Behavioral Interventions to Reduce Loneliness Among Young Adults. Published online February 20, 2019. Accessed November 30, 2023. <https://dash.harvard.edu/handle/1/42013031>
95. Sood E, Nees SN, Srivastava S, et al. Virtually Delivered Psychosocial Intervention for Prenatally Diagnosed Congenital Heart Disease: Feasibility and Acceptability of HEARTPrep. *Pediatr Cardiol*. 2023;44(7):1479-1486. doi:10.1007/S00246-023-03209-7
96. Support intervention for homeless youths - PubMed. Accessed December 11, 2023. <https://pubmed.ncbi.nlm.nih.gov/17970471/>
97. Jackson AC, Francis KL, Byrne G, Christensen DR. Leisure Substitution and Problem Gambling: Report of a Proof of Concept Group Intervention. *Int J Ment Health Addict*. 2013;11(1):64-74. doi:10.1007/S11469-012-9399-9/METRICS
98. Stacey J, Edwards A. Resisting loneliness’ dark pit: A narrative therapy approach. *Tizard Learning Disability Review*. 2013;18(1):20-27. doi:10.1108/13595471311295978/FULL/XML
99. Turner R, Wooten HR, Chou WM. Changing Suicide Bereavement Narrative Through Integral Breath Therapy. *J Creat Ment Health*. 2019;14(4):424-435. doi:10.1080/15401383.2019.1625839

100. Sterne JAC, Hernán MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ*. 2016;355:i4919. doi:10.1136/bmj.i4919
101. Evans RL, Werkhoven W, Fox HR. Treatment of social isolation and loneliness in a sample of visually impaired elderly persons. *Psychol Rep*. 1982;51(1):103-108. doi:10.2466/PRO.1982.51.1.103
102. Balki E, Hayes N, Holland C. The Impact of Social Isolation, Loneliness, and Technology Use During the COVID-19 Pandemic on Health-Related Quality of Life: Observational Cross-sectional Study. *J Med Internet Res* 2022;24(10):e41536 <https://www.jmir.org/2022/10/e41536>. 2022;24(10):e41536. doi:10.2196/41536
103. Chen YRR, Schulz PJ. The Effect of Information Communication Technology Interventions on Reducing Social Isolation in the Elderly: A Systematic Review. *J Med Internet Res*. 2016;18(1). doi:10.2196/JMIR.4596
104. Thangavel G, Memedi M, Hedström K. Customized Information and Communication Technology for Reducing Social Isolation and Loneliness Among Older Adults: Scoping Review. *JMIR Ment Health*. 2022;9(3). doi:10.2196/34221
105. Todd E, Bidstrup B, Mutch A. Using information and communication technology learnings to alleviate social isolation for older people during periods of mandated isolation: A review. *Australas J Ageing*. 2022;41(3):e227. doi:10.1111/AJAG.13041
106. Paquet C, Whitehead J, Shah R, et al. Social Prescription Interventions Addressing Social Isolation and Loneliness in Older Adults: Meta-Review Integrating On-the-Ground Resources. *J Med Internet Res* 2023;25:e40213 <https://www.jmir.org/2023/1/e40213>. 2023;25(1):e40213. doi:10.2196/40213
107. Bessaha ML, Sabbath EL, Morris Z, Malik S, Scheinfeld L, Saragossi J. A Systematic Review of Loneliness Interventions Among Non-elderly Adults. *Clin Soc Work J*. 2020;48(1):110-125. doi:10.1007/S10615-019-00724-0/TABLES/8
108. Masi CM, Chen HY, Hawkley LC, Cacioppo JT. A meta-analysis of interventions to reduce loneliness. *Personality and Social Psychology Review*. 2011;15(3):219-266. doi:10.1177/1088868310377394
109. Osborn T, Weatherburn P, French RS. Interventions to address loneliness and social isolation in young people: A systematic review of the evidence on acceptability and effectiveness. *J Adolesc*. 2021;93:53-79. doi:10.1016/J.ADOLESCENCE.2021.09.007
110. Freedman A, Coe C(, Fcfp), Nicolle J. Social isolation and loneliness: the new geriatric giants: Approach for primary care. *Canadian Family Physician*. 2020;66(3):176. Accessed May 31, 2023. /pmc/articles/PMC8302356/
111. Williams CYK, Townson AT, Kapur M, et al. Interventions to reduce social isolation and loneliness during COVID-19 physical distancing measures: A rapid systematic review. *PLoS One*. 2021;16(2):e0247139. doi:10.1371/JOURNAL.PONE.0247139
112. Fernández-Carro C, Jordi ·, Lao G, Lao JG, Fernández-Carro C, Lao JG. A Life-Course Approach to the Relationship Between Education, Family Trajectory and Late-Life Loneliness Among Older Women in Europe. 2022;162:1345-1363. doi:10.1007/s11205-022-02885-x
113. Crewe SE, Thorne C, Muñoz N. Eradicating Social Isolation: Focus on Social Exclusion and Racism. *Social Work and the Grand Challenge to Eliminate Racism: Concepts, Theory, and Evidence Based Approaches*. Published online January 1, 2023:383-407. doi:10.1093/OSO/9780197674949.003.0015

114. Naito R, Leong DP, Bangdiwala SI, et al. Impact of social isolation on mortality and morbidity in 20 high-income, middle-income and low-income countries in five continents. *BMJ Glob Health*. 2021;6:4124. doi:10.1136/bmjgh-2020-004124
115. Miyawaki CE. Association of social isolation and health across different racial and ethnic groups of older Americans. *Ageing Soc*. 2015;35(10):2201. doi:10.1017/S0144686X14000890

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