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Primary care-based interventions addressing social isolation and loneliness in older people: a scoping review

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ABSTRACT

Objectives Primary care is well positioned to identify and address loneliness and social isolation in older adults, given its gatekeeper function in many healthcare systems. We aimed to identify and characterise loneliness and social isolation interventions and detect factors influencing implementation in primary care.

Design Scoping review using the five-step Arksey and O'Malley Framework.

Data sources MEDLINE, CINAHL, EMBASE, COCHRANE databases and grey literature were searched from inception to June 2021.

Eligibility criteria Empirical studies in English and Spanish focusing on interventions addressing social isolation and loneliness in older adults involving primary care services or professionals.

Data extraction and synthesis We extracted data on loneliness and social isolation identification strategies and the professionals involved, networks and characteristics of the interventions and barriers to and facilitators of implementation. We conducted a thematic content analysis to integrate the information extracted.

Results 32 documents were included in the review. Only seven articles (22%) reported primary care professionals screening of older adults' loneliness or social isolation, mainly through questionnaires. Several interventions showed networks between primary care, health and non-healthcare sectors, with a dominance of referral pathways (n=17). Two-thirds of reports did not provide clear theoretical frameworks, and one-third described lengths under 6 months. Workload, lack of interest and ageing-related barriers affected implementation outcomes. In contrast, well-defined pathways, collaborative designs, long-lasting and accessible interventions acted as facilitators.

Conclusions There is an apparent lack of consistency in strategies to identify lonely and socially isolated older adults. This might lead to conflicts between intervention content and participant needs. We also identified a predominance of schemes linking primary care and non-healthcare sectors. However, although professionals and participants reported the need for long-lasting interventions to create meaningful social networks, durable interventions were scarce. Sustainability should be a core outcome when implementing loneliness and social isolation interventions in primary care.

Strengths and limitations of this study

- This is the first scoping review providing an overview of the role and characteristics of primary care-based interventions to identify and address loneliness and social isolation in older adults living in the community.
- This study followed rigorous methods, including a comprehensive search of multiple databases and grey literature and systematic study selection, data charting and collation.
- Relevant articles might not have been identified during the screening phase if primary care was not labelled according to the key terms contained in the search strategy, under-representing regions without primary care or with differently defined first levels of care.
- This scoping review is limited to peer-reviewed empirical studies in Spanish and English and only includes one grey literature record which met eligibility criteria and, therefore, the results are not representative of all countries.

INTRODUCTION

Loneliness and social isolation are public health issues that gained global attention during the COVID-19 pandemic lockdowns.[1] The two concepts are closely related yet reflect distinct psychosocial processes. Loneliness is defined as an unpleasant emotional state resulting from the perception of insufficient social relationships, either in quantity or quality.[2] Loneliness implies a subjective and negative experience product of a mismatch between the existing and the desired social connections.[3] In contrast, social isolation reflects an objective absence or a scant number of social relationships with other people. Thus, socially isolated individuals might not experience loneliness if the lack of relations aligns with their desires and expectations. Similarly, a person can feel lonely independently of the number of connections if this number is not quantitatively or qualitatively desirable.[3] Despite being independent constructs, loneliness and social isolation are often studied simultaneously in health research, given their similar detrimental effects on health outcomes.[4 5] Recent studies found that adults experiencing loneliness and social isolation have a likelihood of

mortality increased by 29% and 26%, respectively,[6] and are at higher risk of cardiovascular and mental diseases.[7–9]

Older adults are especially prone to loneliness and social isolation.[10] Estimates of the prevalence vary depending on measurement methods and countries, ranging from >13% in the UK,[11] and 18.6% in Canada,[12] to 25% in the USA.[13 14] Recent reviews indicated that ageing-related events such as the loss of a partner, friends or relatives, or health impairments, including hearing loss and functional limitations, are associated with a decrease in social relationships, leading to a higher risk of loneliness and social isolation.[15–17] In addition, income and living conditions influence loneliness and social isolation. The prevalence of loneliness in older adults living in poor households is 10% higher than that of those living in higher-income households, according to a survey of 14 European countries.[18] In contrast, living with ≥2 people has been shown to significantly reduce the risk of loneliness (OR: 0.39, 95% CI 0.32 to 0.47).[18] Similar patterns have been reported for social isolation, living arrangements and income.[19] Other studies linked social isolation with limited availability of social activities or transportation,[19] less social support[12] and living in less cohesive communities, defined as the extent of connectedness and solidarity among social groups.[20] The presence of multiple typologies of risk factors suggests that loneliness and social isolation are social problems that may require comprehensive responses and synergic collaboration between health and non-health sectors. However, theoretical approaches guiding loneliness and social isolation interventions have been claimed to be heterogeneous, with the risk of conveying conceptual inconsistencies.[21]

Primary care professionals (ie, family physicians, primary community and nurse practitioners and social workers) often provide first-level care and are well situated to reach out to lonely and socially isolated individuals.[22 23] In countries with a national healthcare system including primary care, such as Spain or the UK, citizens are registered in primary care centres and have lifelong follow-up,[24 25] allowing primary care professionals to identify social, physical and mental factors associated with loneliness and isolation in their assigned population during routine consultations.[26] Moreover, long-lasting therapeutic relations with primary care professionals might motivate older adults to continue visiting primary care services despite being socially isolated or lonely, in some cases as a point of social contact.[22] However, our preliminary search indicated that primary care professionals' screening for loneliness and social isolation in older adults may be limited,[27 28] partially due to uncertainty about how to proceed after lonely and isolated persons are identified.[29]

While identifying loneliness and social isolation in primary care settings is crucial, clinical and public health interventions must be available after detection.[30] Strengthening primary care collaboration with other health and non-healthcare sectors has been widely proposed to address factors leading to social isolation and loneliness.[22 23 30] For instance, a recent report from the US National Academies of Sciences, Engineering and Medicine recommended further implementation of evidence-based loneliness and social isolation assessment, prevention and interventions by healthcare professionals, enabled by more robust integration between primary care and community sectors.[30] Establishing connections between primary care and other health (ie, specialised care) and non-healthcare sectors (ie, third sector organisations, volunteer groups) could allow primary care professionals to complement medical treatments with additional resources to strengthen older adults' social networks[31 32] or respond to underlying medical problems (ie, hearing loss limiting sociability).[33 34] Despite rising interest in these new approaches, the National Academies report emphasised that researchers are at the onset of comprehending how loneliness and social isolation interventions work.[30]

Primary care interventions to identify and address loneliness and social isolation in older adults may vary between regions. In addition, collaboration configurations between primary care and other health and non-healthcare sectors vary depending on contextual aspects, such as the characteristics of the primary care system or the availability of resources.[35] This translates into the use of multiple definitions to refer to these configurations, such as social prescribing pathways[36] or asset-based community projects[37] in the UK or structured referral pathways in Canada.[38] Understanding how primary care professionals identify these social problems and the characteristics of interventions integrating primary and other sectors when addressing loneliness and social isolation is crucial to inform current and future interventions. Previous research synthesis in this field focused on general descriptions of intervention activities and outcomes, with no focus on the role of primary care in addressing them.[15 39–44] To fill this research gap, we propose a systematic scoping review of the current research base in primary care-based loneliness and social isolation interventions. In particular, we aim to understand the strategies used by primary care professionals to identify loneliness and social isolation, to describe the characteristics of primary care-based interventions, and to detect facilitators and barriers influencing their implementation. The following research questions guided our review: (1) What is the literature on strategies used to identify loneliness and social isolation among older community dwellers in interventions involving primary care services?; (2) what are the characteristics of existing interventions involving primary care services and other health/non-healthcare sectors to address social isolation and loneliness among older community dwellers? and (3) what facilitators and barriers affect the implementation of loneliness and social isolation interventions in primary care settings?

METHODS

We followed the five-step Arksey and O'Malley methodological framework:[45] identifying the research questions, identifying relevant studies, study selection, charting the data and collating, summarising and reporting the results. In addition, we used the population, concept and context approach[46] when developing the research questions and search strategy, whereby the population refers to older

adults, concept to loneliness and social isolation, and context to primary care settings. A protocol containing the rationale, objectives, research questions, and detailed methods of the review was developed between June and August 2020, and prospectively registered in Open Science Framework.

Definitions

We defined primary care based on the UK or Spanish models as the frontline entry to healthcare, such as primary care, community centres, general practice, home care and community pharmacies.[47–49] We adopted the generic term non-healthcare sectors to encompass all resources or organisations supporting loneliness and social isolation interventions outside primary care or healthcare systems. Older community-dwellers (hereafter older adults) were defined as non-institutionalised or hospitalised persons aged >60 years.[50]

To understand how primary care professionals identify loneliness and social isolation in older adults, we focused on determining which primary care professionals are involved in identifying them and the methods used (ie, scales). To study the characteristics of the interventions, we focused on data describing the arrangement of elements within the intervention (hereafter networks), namely, the sectors involved and the pathways used by professionals (ie, referrals from primary care to community organisations). In addition, we studied how stakeholders generated these networks between sectors, and we captured crucial intervention evaluation elements recommended by the National Academies,[30] such as the theoretical frameworks underpinning the interventions, sustainability and strategies for data sharing between sectors.

Identifying relevant studies

We searched four databases (MEDLINE, CINAHL, EMBASE, COCHRANE reviews) using MeSH terms and keywords related to the components of the research question. First, we detected key terms and synonyms by analysing relevant papers in Yale Mesh Term Analyzer[51] to develop an initial search in MEDLINE. A research collaborator from the University of Toronto library verified the comprehensiveness of the search strategy. Next, we adapted the search strategy to the databases following an advanced literature search sheet.[52] Finally, we conducted a hand search on Google using the key terms loneliness, social isolation and primary care to identify grey literature. To fully capture the extent of the literature, time restrictions were not applied. The literature search was initially conducted from June to August 2020, with an update in June 2021. The complete search strategy is included in online supplemental material 1.

Study selection

Titles and abstracts were assessed by two reviewers. We included empirical studies in English and Spanish focusing on interventions to address older adults social isolation and loneliness involving primary care services or professionals, exclusively or in coordination with other sectors and workers, such as specialised care, outpatient clinics or Non-Governmental Organizations (NGOs). We excluded interventions delivered outside these settings or not provided by primary care professionals (ie, solely offered by NGOs, social clubs, or academic researchers), involving institutionalised adults, or theoretical studies and commentaries. To ensure rigour during the screening phase, we screened titles and abstracts, followed by the full text, using COVIDENCE software,[53] after carrying out a pilot test to detect potential inconsistencies when applying eligibility criteria. The pilot test comprised (1) an independent screening by two reviewers of a set of one hundred records yielded from the search, (2) an assessment of discrepancies on the number of records included and excluded, (3) a final meeting to discuss potential inconsistencies and doubts concerning eligibility criteria.

Charting the data, collating, summarising and reporting the results

Data extraction followed an iterative process as the charting table was updated if additional unforeseen data was found.[46] The charting table included descriptive data including title/authors, year of publication, country of origin, study design/setting/aim, study population and sample size and key findings. The key findings section contained three columns related to (1) loneliness or social isolation identification strategies (ie, tools used and role of primary care professionals involved), (2) intervention characteristics (ie, type of health and non-healthcare sectors, strategies to create connections between sectors, pathways used by primary care professionals, data sharing between sectors, theoretical aspects and intervention duration) and (3) facilitators and barriers (factors promoting or hindering implementation outcomes). We used qualitative content analytical techniques,[54] involving transferring the charted data into a database and assigning codes according to distinct units of meaning, grouping data with similar codes into categories, and integrating multiple categories into themes. For instance, data on the type of sectors involved in the interventions coded as 'only primary care involved', 'connection between health and non-health sectors', and 'connection between healthcare sectors', were grouped into a category named 'sectors and pathways'. Finally, we integrated the categories into themes that addressed the proposed research questions.

Patient and public involvement

No patients or public were involved in the study. No ethical approval was needed because data were collected from previously published studies in which informed consent was obtained.

RESULTS

The search strategy yielded 12 397 papers, 34 reports and 8 articles from literature review references. After removing duplicates, 7848 document titles and abstracts

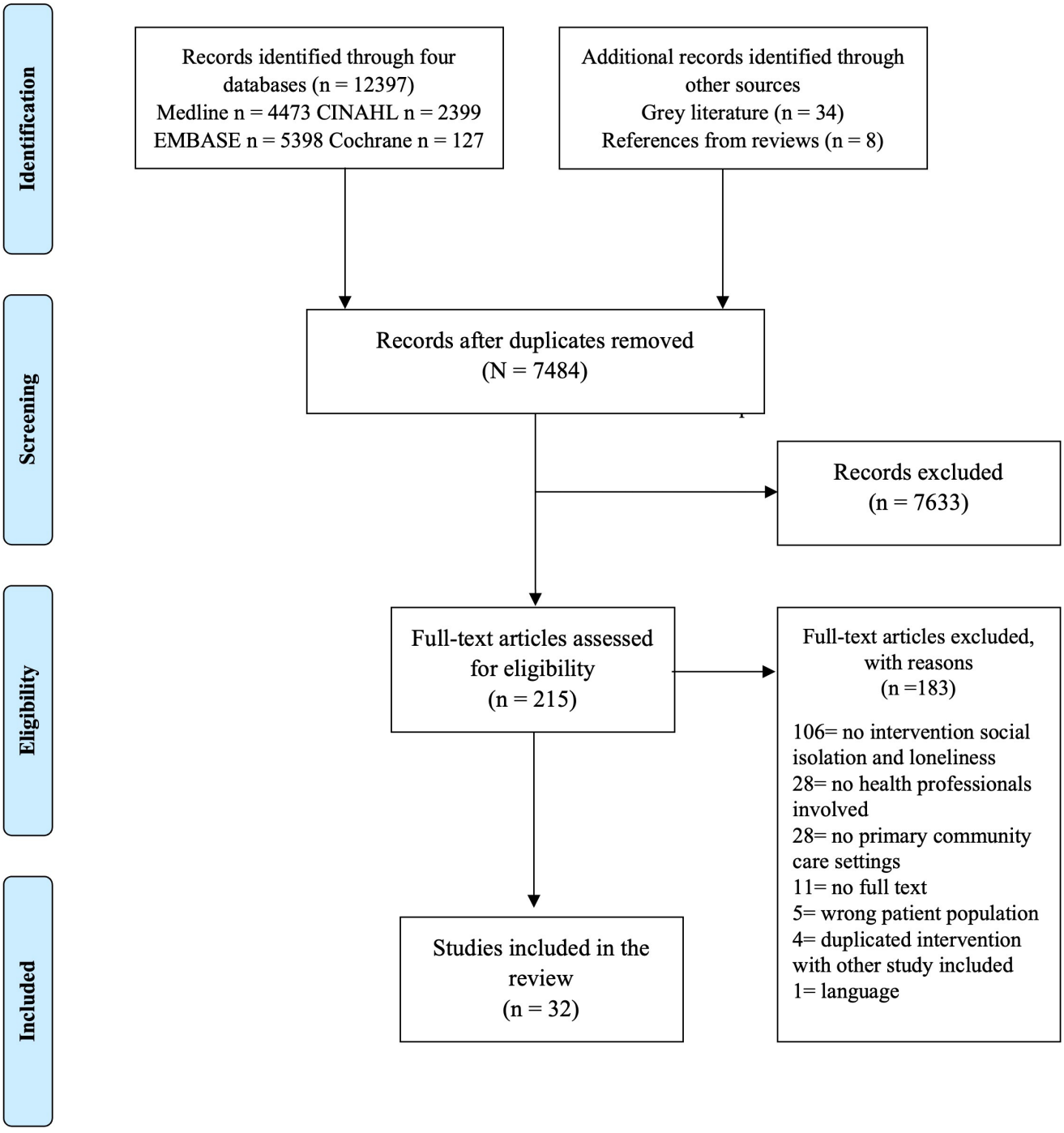

Figure 1 Study inclusion flow chart, according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA checklist).

were screened, and 215 records were eligible for full-text screening. Finally, we included 32 articles for the reasons shown in figure 1. Twenty-eight per cent of the studies (n=9) were conducted in the UK (table 1). Eighty-eight per cent (n=28) were published between 2014 and 2021. All studies included primary data and mostly followed quantitative, non-Randomized Controlled Trials, and mixed-method methodologies. Twenty studies (63%) exclusively focused on social isolation or loneliness, while the rest addressed these issues in addition to other geriatric conditions (ie, risk of falls, sensory impairments, urinary incontinence).[34] A chart with detailed data for each article is available in online supplemental material 2.

Strategies used to identify loneliness and social isolation among older adults in primary care services

Only seven articles (22%) reported strategies to identify loneliness or social isolation in older adults during the recruitment phases of the interventions.[55–61] The strategies comprised the administration of questionnaires to potential participants with a single screening loneliness

Table 1 Characteristics of reports included (n=32)

Characteristics	n of studies included n (%)
Country	
UK	9 (28)
Spain	6 (19)
USA	6 (19)
Netherlands	4 (13)
Finland	2 (6)
Croatia, Holland, Iran, Sweden, Canada*	5 (15)
Year of publication	
2018–2021	20 (63)
2014–2017	8 (25)
2009–2013	4 (13)
Study design	
Non-RCT quantitative designs (quasi-experimental, transversal)	11 (34)
Mixed-method	11 (34)
Qualitative designs	5 (16)
RCT	5 (16)

*One study per country.
RCT, Randomized Controlled Trial.

item (n=4), asking individuals 'do you feel lonely?' during clinical encounters with primary care professionals (n=1), administering a loneliness scale (n=1), and searching for lonely and socially isolated patients in medical records using keywords (n=1). Most studies (n=26, 81%) did not report loneliness and social isolation assessments to identify potential participants. Instead, in 13 studies (41%), individuals were invited to participate in loneliness and social isolation interventions based on the presence of risk factors (ie, age >65 years, living alone, consultation gaps). Complementary strategies to recruit socially isolated and lonely patients included advertising posters[55] and leaflets[31 62 63] distributed within primary healthcare facilities.

In contrast, 44% of studies reported using loneliness and social isolation scales and questionnaires after older adults were enrolled for baseline and follow-up measurements. Five validated instruments were used to measure loneliness and two with social isolation as outcomes. The remaining 14 articles described various methods, including semistructured interviews[64] and questionnaires.[63] The detection method was not reported in seven studies because participants were recruited from existing interventions or for unknown reasons (table 2).

Family physicians,[26 34 55 57 60 65 66] primary care nurses,[36 55 59 60 67 68] and social workers,[55 69] identified lonely and socially isolated adults in the recruiting phases of the interventions. The nonspecific term 'primary care teams' was used in two studies.[32 61 63 70–72] Six studies reported that family physicians,[36 62 64 73] nurse practitioners,[31 64] social workers,[31] pharmacists[31] and primary care teams[74] referred participants from primary care to other settings without providing information about identification strategies.

Table 2 Strategies used to identify loneliness and social isolation among older adults in primary care services

Detection strategies	Loneliness	Social isolation
Scales	UCLA†*[31 36 59 60 67 79 71] De Jong Gierveld*[65 77]	DUKE UNC*[31 72] Lubben's Social Network Scale*[59]
	Tilburg Frailty indicator (loneliness sub item)*[65 68]	
	Campaign to End Loneliness Tool*[38]	
	INQ-Belong*[56]	
Item in a questionnaire	'Do you feel lonely nowadays?' (yes very, yes rather, no I don't)*[63] Feeling lack of companionship†[61] 'I feel lonely (yes/no)'†[56]	Have problems related to social isolation*[64] Self-reported involvement in social activities community belonging*[38]
	'Do you suffer from loneliness?'†[58 59]	
Question during clinical encounter	'Do you feel lonely?'†[55]	
Electronic medical records	Search lonely patients in EMR†[57]	Search isolated patients in EMR†[57]
Indirect strategies	Inviting older adults age >60†[26 31 60 65 67 68 74]	Older adults with low mobility, architectural barriers†[32 70]
	Considering at risk older adults living alone†[61 74]	Attending mental health services†[75]
	Consultation gap >3 years†[34]	
	Physical limitations, low income, mild mental disabilities or recently widowed†[62]	
Not disclosed	33 36 38 66 69 71 73 78	

*Assessment of loneliness and social isolation as outcome measure of the study during the interventions.
†Identification strategies to recruit older adults for loneliness and social isolation interventions.
EMR, Electronic Medical Record; INQ, Interpersonal Needs Questionnaire; UCLA, University of California Los Angeles Loneliness Scale.

Characteristics of primary care-based interventions to address social isolation and loneliness among older community dwellers

Sectors and pathways

Sixty-six per cent of the articles (n=21) reported interventions involving multiple health and non-healthcare sectors. The most prevalent pattern (n=17, 53%) consisted of referral pathways, including community referral pathways,[55] social prescribing prescribing[73 75] and care-pathways[65] that linked primary care and non-healthcare interventions (table 3). A range of terms were used to define non-healthcare sectors, such as community resources or community organisations,[73] local community assets[38 55 71] and social groups.[36] Through these pathways,

Table 3 Primary care-based loneliness and social isolation intervention pathways

Referral pathways	Non-referral pathways
Primary care professionals refer older adults to a proxy worker, which connect them to non-healthcare sectors.[36 38 64 71 73]	External agency recruited older adults from primary care settings, and paired them with volunteers.[56]
Primary care professionals refer older adults directly to non-healthcare sectors.[32 38 55 60 61 65 66 70 74 75]	Teams of community health and social care professionals connect hospital discharged adults to volunteers.[78]
Primary care professionals refer older adults to an external organisation which connect them to non-healthcare sectors.[31 62 68]	External researchers identify lonely older adults and connect them with primary care services that lead the interventions.[58 79]
Primary care professionals refer older adults to other healthcare services.[34 64 76]	No-network interventions, where primary care professionals identified lonely, isolated older adults and delivered the intervention in the same setting.[26 57 59 63 69 77]

primary care professionals identified and referred older adults experiencing loneliness, social isolation or related risk factors to non-healthcare sectors such as community resources or volunteering (table 4). In five studies (16%), the referral pathways included a proxy, that is, link workers,[36] social prescribing coordinators[73] and navigators[38] who had in-depth knowledge of community resources and connected participants with tailored resources based on their needs, provided follow-up,[71] or delivered health education.[64] In other instances (n=4, 12%), the studies described alternative non-referral pathways whereby external research or social organisations identified and enrolled lonely and isolated older adults from primary care settings.

Primary care professionals linked older adults with other health resources in five studies (16%) after assessing high-risk individuals for multiple age-related chronic conditions, including loneliness.[76] In the study by Bleijenberg *et al* primary care nurses conducted holistic geriatric assessments at home and referred lonely or isolated older adults to specialist services to address underlying medical factors (ie, hearing loss, lack of mobility).[34] Five studies reported no-network interventions, where primary care professionals identified lonely, isolated older adults and delivered the intervention in the same setting.[26 57 59 63 69 77]

Table 4 Examples of sectors involved in primary care interventions

Type	Examples
Non-healthcare sector	
Community resources and activities[31 38 55 58 61 64 66 68 73 75]	Culture organisations, nature groups, senior services, sport and walking clubs, yoga groups, cookery lunch clubs, libraries, religious group, museums, neighbourhood associations, art-based and music groups, social and support groups, continuing education centres, welfare rights advice, Non-Governmental Organizations (NGOs).
Volunteering[32 38 56 61 70 78]	Companions for outdoor walks for low mobility adults, befrienders, peer companions, volunteering instructors on healthy habits and psychosocial aspects, Health Champions
Technology services[26 33 74 77]	Telephone-based platform, communication platform through television, assessment software to enhance detection complex social needs.
Health sector	
Medical non-primary care services[34 64 76]	Ophthalmologist services, audiometric specialists, adult day healthcare centres, mental health services, Cognitive Behavioural Therapy, geriatric health services

Theoretical approaches, network generation, sustainability and data sharing

Of the 32 interventions, 66% (n=21) did not provide clear theoretical underpinnings to justify the design of the intervention and the potential effects on lonely and socially isolated individuals. Eight studies (26%) used concepts related to loneliness and social isolation (ie, increase social cohesion or social support) to support their rationale, and only five provided theories (table 5).

Nine studies (28%) explained how the stakeholders generated the intervention networks to address social isolation and loneliness in older adults. These articles reported varied approaches, ranging from collaborations between primary care professionals and older adults[34] to intersectoral partnerships between regional health services, municipalities, and welfare organisations[62] (table 4).

The duration of the interventions ranged from 2 weeks to permanent interventions integrated in clinical practice for >2 years. The span of interventions in 12 studies (37%) was <6 months, with 9 (28%) lasting <3 months. The interventions were mainly pilot studies. In contrast the duration was >2 years in nine interventions (28%), which commonly reported follow-up evaluations. Financial and human resource shortages hindered the continuity of the intervention and their implementation in five studies,[38 55 71 77 78] and one intervention was cancelled due to lack of funding.[71] Eight studies (25%) reported shared electronic medical records or in-person communication information as data-sharing strategies between primary care professionals and non-healthcare sectors (table 5).

Factors affecting the implementation of loneliness and social isolation interventions in primary care services

Barriers

Primary care professionals' workload was a barrier in four studies.(12%) Social isolation and loneliness interventions were perceived as time-consuming, given the time required to build trust with participants, design and

Table 5 Relevant aspects of primary care-based loneliness and social isolation interventions

#DOC	
	Intervention theoretical approaches
	Loneliness-social isolation related constructs.
78	Enhance social network development.
73	Promote social integration and social reactivation.
55	Increase social cohesion.
33 36 56	Increase social connectedness.
61	Encourage participation in the community.
60	Increase social support.
	Theories
55	Social capital theory.
62	Van Tilburg network development theory.
36	The social cure framework.
79	Story theory and cognitive restructuring.
38	Model of health and well-being.
	Creation of the networks
34	Researchers, GPs, RNs, experts, and older persons designed intervention and network.
55	Coordinated action to strengthen network between primary care centres, senior centres and other community assets.
38	Community centres created or updated an asset map to compile community resources for social prescriptions.
62	A group including regional mental health service, regional community health service, local elderly welfare organisation, municipality developed intervention, informed by interviews with older adults, professionals, and policymakers.
71	Social prescribing space created via consultation with 20 organisations (ie, health, social care and charities working with the target population).
64	Network generated by consultation with patients and healthcare professionals over an 8 year period.
33 36 65	Networks between primary care and other settings already existent.
	Reported intervention duration
57	<1 month
31 58 59 71 74 75 78 79	1–3 months
60 61 66	3–6 months
63 68 76	6 months –1 year
34 38 64 72 73	1–2 years
26 32 36 55 56 62 65 69 70	>2 years
33 67 77	Unknown
	Data sharing between sectors
34 38	In person meetings to coordinate plans between RN, GP and other healthcare professionals.
64 66	Delivering physical referral forms with patient information link workers or to the coordinator of third sector organisations.
31 65 74	Healthcare professionals place data/referrals/consultations in shared electronic medical records.
76	RN Navigators introduce assessment and screening tools data into cloud database.

GPs, general practitioners; RN, registered nurse.

apply the intervention, or train the people involved.[34 65] Two studies reported challenges faced by professionals while taking on new interventions and existing workload amidst fast-paced clinical environments,[36 38] prioritising diagnosis-treatment activities. In addition, family physicians experienced uncertainty about how to proceed after identifying loneliness if referral resources were unavailable.[36] Similarly, workload-related barriers affected link workers in one study, where a high volume of referrals decreased the quality of social prescribing services.[36] Centralising interventions around overburdened professionals endangered continuity due to potential turnover.[38] In two studies, primary care professionals reported struggling to incorporate volunteers for social prescribing interventions due to a lack of interest.[55 78]

Barriers affecting patient participation were reported in nine studies (28%). First, misinformation about the referral process and the role of linking professionals confused patients affecting their engagement.[73] Similarly, one study reported worse feedback from participants when primary care professionals lacked a proper understanding of the referral pathways.[36] In three studies, socially isolated and lonely older adults expressed reluctance to engage in group activities based on discomfort when joining a group while not knowing anyone.[36 57 69] Participating in large groups without facilitating staff hindered socialisation and deterred attendance.[69] Age-related factors such as physical and mental health limitations affected participant engagement in five interventions.[57 61 65 77 79]

Organisational barriers affected intervention implementation in several studies. Two studies described a lack of fit between participant interests, session content and participants, leading to loss of interest and discontinuity in attendance.[36 74] In another intervention, the authors acknowledged a lack of standardised or explicit strategies for addressing loneliness, which decreased effectiveness.[63] Primary care professionals' short time of involvement in one intervention hindered the generation of trust with participants, affecting participation rates and outcomes.[78] Lack of transportation, intervention prices and lack of interconnected IT resources between sectors were described as barriers for older adults' participation in one study.[38] Two studies reported difficulties in delivering technology-based interventions, either due to user challenges or technology errors, affecting attendance.

Facilitators

Three studies reported that having existing pathways to connect patients with community assets facilitated the intervention's success and increased early adoption as they gave primary care professionals the tools to address social isolation and loneliness once detected.[36 60 65] In addition, interventions relying on existing networks consisting of primary care services, community resources and volunteers lowered costs and favoured sustainability.[56 61 74] Other studies based on referral pathways highlighted that having closer access to link workers or programme coordinators (ie, working within primary care) increased their visibility among healthcare professionals and influenced the adoption of the intervention.[31 34 36]

In four studies, healthcare professionals and patients expressed the need for prolonged programmes to have more time to build social connections and trust relationships with other participants.[33 60 64 66] For instance, Voegepoel and Jarrold extended the intervention for longer than the pre-established 12 weeks to promote the effect on social relations.[66] Older adults reported benefits and increased participation due to extended sessions with the link workers because they could share their needs and be heard.[36] Three studies reported that delivering affordable activities was crucial to ensure equal access to those activities.[38 59 69] For example, in the communal table project, the €1 three-course dinner allowed equitable participation independently of socioeconomic position.[69]

A perceived fit with the activity content and group participants was crucial for older adults' continuity in two studies. Engagement and outcomes improved when patients' motivations and interests informed the design of the content.[58 69] For instance, Howarth *et al* reported that collaborative approaches—involving organisation, healthcare professionals and patients—when creating the intervention network led to positive effects because it acknowledged lonely and socially isolated patients' needs.[71] Six studies also reported adapting the intervention to the participants' physical and mental health conditions to ease access by arranging a place adapted to disabilities and sensory impairment;[61 66 79] planning the activities with a proper frequency and duration;[61 79] offering transportation or parking accommodation[38 58 59 66 79] and sending periodic reminders before the intervention.[66 79]

In two studies, lonely and isolated older adults' engagement in interventions increased when primary care nurses, link workers and volunteer neighbours participated, due to pre-established trust relationships.[56 61] In addition, programme coordinators, link workers, and primary care professionals accompanied new participants to the groups to facilitate engagement and lessen fear when not knowing anyone.[61 64 66] In four studies, participants highlighted how health professionals' specific attributes, such as being warm, friendly or good listeners, helped build trust and favoured their adaptation to the intervention.[38 61 64 79]

DISCUSSION

We provide an overview of aspects of primary care-based interventions to address social isolation and loneliness in older people. Loneliness and social isolation interventions with primary care participation have risen over the past 6 years. This may be due to the medicalisation of these social problems, motivated by recent studies linking loneliness and social isolation with higher mortality, worse health outcomes[6] and international calls for responses from healthcare systems since 2015.[23 30] We found that primary care professionals did not screen older adults' loneliness and social isolation before enrolling them in most interventions. Instead, there was a significant reliance on risk factors (ie, older age, living alone) as inclusion criteria. We identified a predominant intervention configuration in which primary care networked with one or more health or non-healthcare sectors to deliver the interventions. The interventions reviewed presented heterogeneous configurations, theoretical approaches and duration across studies, partially reflecting a lack of well-established models to address loneliness and social isolation.[30]

While only seven interventions reported screening older adults' social isolation and loneliness before joining an intervention, fourteen studies described the use of validated instruments to measure intervention outcomes. These results align with studies highlighting underscreening of these social problems[27 29] and a tendency to enrol easy-to-reach adults to ease complications in recruiting isolated and lonely individuals.[30] Referring older adults to loneliness intervention groups without an appropriate assessment might lead to confusion and negative experiences, such as a lack of fit with the activities or a clash with preferences to deal with loneliness and social isolation privately.[80]

We found that primary care professionals might perceive loneliness or social isolation assessments as a secondary duty. Similarly, in a recent qualitative study, family physicians acknowledged prioritising biomedical aspects over loneliness assessments due to work overload and limited time during clinical visits.[29] Thus, underscreening of

these social problems is seemingly motivated by structural barriers in primary care settings rather than a lack of measurement tools.[81] In addition, previous qualitative studies found that older adults using primary care services might be reluctant to label themselves as lonely or isolated due to the associated stigma.[80 82] Thus, there is a need to develop efficient identification strategies that do not interfere with clinical practice. Efforts should focus not only on screening, but also on ensuring continued follow-up for lonely and socially isolated older adults. Future strategies might involve identifying individuals at risk using machine-learning natural language processing algorithms that autonomously explore social isolation or loneliness keywords in electronic health records[83] or through maps to detect areas with a higher risk of loneliness.[84] However, these methods will require further consideration of ethical issues concerning autonomy or privacy before being broadly implemented in clinical practice.[30]

Two-thirds of the studies reported networks of primary care and one or more health or non-healthcare sectors to deliver the interventions, with referral pathways linking older adults from primary care to community resources, activities, or volunteering as the most common. This model is predominant given the high proportion of UK studies, where social prescribing schemes have been publicly funded since 2017.[23] The high number of records adopting this approach aligns with international calls by the WHO and other international organisations to strengthen intersectoral collaborations by primary healthcare and non-health sectors to address population health and social needs.[30 85 86] Despite this promising finding, we found that most interventions failed to provide theoretical justifications grounding the interventions. When reported, concepts and theories underpinning loneliness and social isolation varied across interventions. This heterogeneity hinders the interpretation of the results across studies, given the differences in assumptions and mechanisms of action when addressing loneliness and social isolation. Although some theories have been developed,[82 87] loneliness and social isolation research in older age has no clear consensual theoretical framework.[30 81] Further research might address the gap between theoretical models, clinical practice and public health programmes.

We also found high variability in intervention duration, ranging from 2 weeks to more than 2 years. This conflicts with the need for long-term interventions reported by older adults and professionals.[60] Four studies indicated that longer interventions are required to effectively enhance older adults' social networks, since building social connections and trusting relationships may be slow. Thus, achieving sustainability should be a core outcome of implementation efforts. Our findings align with reports showing that over-reliance on external funds, such as temporary grants, may limit the continuity of the interventions.[88] In contrast, intersectoral networks connecting pre-existing resources, such as primary care services, existing community resources, and volunteers, are promising configurations to achieve permanent interventions embedded in clinical practice.[61] Recent calls amidst the COVID-19 pandemic sought to strengthen intersectoral collaborations between health and non-health sectors to address complex social problems and ensure health equity,[89 90] which indicates a window of opportunity to foster these approaches by influencing health agendas globally. Future evaluations informed by realist epistemologies are required to understand the mechanisms enabling the sustainable implementation of loneliness and social isolation interventions in health and non-healthcare settings.[91]

We identified several facilitators influencing intervention outcomes and implementation. Well-defined referral pathways, collaborative approaches to design interventions, accessible and long-lasting interventions, and the involvement of professionals with strong interpersonal skills promoted successful intervention implementation. Studies have highlighted the positive effects of involving professionals with solid listening and communication skills to build trust relations with participants and help lessen fears when enrolling in new activities.[88 92] In addition, we found that facilitating access to interventions in the form of transportation or affordability is a crucial component, as found by other reports.[93] We also found that participants' and professionals' poor understanding of referral pathways, lack of fit between intervention components and participant interest, age-related limitations and the fear of joining new groups, were barriers that affected overall intervention uptake and acceptability. Interventions should be adapted to participants' age-related physical and mental health conditions and social needs. Thus, adopting participatory or bottom-up approaches engaging the target population is paramount to design interventions tailored to the characteristics and needs of lonely and isolated older adults.[94]

Limitations

This scoping review provides a broad overview of an unexplored topic and opens new research opportunities on how to involve primary care to tackle social isolation and loneliness in older adults. However, the study had some limitations. First, it only includes peer-reviewed empirical studies in Spanish and English, and despite efforts to incorporate grey literature, we only identified one report which fulfilled the inclusion criteria, limiting the comprehensiveness of the review. Second, we conceptualised the search strategy using terms and synonyms of primary care. Thus, the review does not represent interventions conducted without primary care participation in other sectors such as research institutions, volunteering or NGOs. In addition, we did not capture healthcare sectors not labelled as primary care or their synonyms included in the search strategy, under-representing regions without primary care or with first-level care defined differently. We limited the review to primary care as we were interested in exploring the characteristics of interventions in

this healthcare sector to answer the research questions. Finally, we encountered vague definitions relating to primary care, loneliness and social isolation in several articles, which posed a challenge during the eligibility phase of the review. We addressed this limitation by searching for widely used synonyms and excluding reports with a high degree of lack of clarity. A quality appraisal of the articles was not conducted as the scoping review aimed to map the existent literature instead of detecting the best available evidence to answer the proposed exploratory questions.[45 46]

CONCLUSION

Older adults are commonly enrolled in interventions to address loneliness and social isolation in primary care based on broad risk factors such as age or living arrangements without an assessment of these social problems. This might lead to undesired outcomes resulting from a lack of fit between older adults' needs and the content of the intervention. There appears to be an increase in interventions consisting of intersectoral collaborations between primary care and non-healthcare sectors. Although this is a promising approach, widely supported by international organisations, improvement is required in reporting the theoretical underpinnings of the interventions. Long-lasting interventions are necessary to achieve meaningful social networks that can benefit lonely and socially isolated older adults. However, a significant number of interventions reported a duration of <6 months. Achieving sustainability should be a central outcome when designing and implementing loneliness and social isolation interventions in primary care.

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Supplementary material 1. Complete original search strategy MEDLINE and translated searches for EMBASE, CINAHL, COCHRANE

Search strategy MEDLINE

Concept 1: loneliness and social isolation
1.Loneliness/
2.Social Isolation/
3.(loneliness or living lonely or living alone or lonely).tw,kf.
4.(social adj2 (alienat* or isolat* or exclu*)).tw,kf.
5. 1 OR 2 OR 3 OR 4
Concept 2: Primary and community care
6.exp Primary Health Care/
7.exp Community Health Services/
8.exp ambulatory care facilities/
9.exp ambulatory care/
10.exp home care services/
11.(primary care or primary healthcare or communit* or integrated care or ambulatory care or social work* or home care or mental health service* or domiciliary).tw,kf.
12.family practice/
13.nurse practitioners/
14.family physician/
15.community health nursing/
16.exp social work/
17.Family Nursing/
18.General Practitioners/
19.((primary or community) adj2 (provider* or professional* or clinician* or physician* or doctor* or nurs* or psychiatrist or practitioner*)).tw,kf.
20.(Social work* or family medicine or family practice or GP or family care team or family team).tw,kf.
21. 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20
Concept 3 Older non-institutionalized adults
22.exp Aged/
23.geriatrics/
24.aging/
25.(older adult* or community-dwelling elder* or elder* or older people or aged or aging or ageing or non-institutionalized or community living individual* or adult* or geriatric or old population or chronic* ill patient* or chronic* patient* or frail elderly).tw,kf.
26. 22 OR 23 OR 24 OR 25
5 AND 21 AND 26

Translated search strategy into EMBASE, CINAHL and COCHRANE (Onset -01 June 2021)

EMBASE

(Loneliness/ or "Social Isolation"/ or (loneliness or "living lonely" or "living alone" or lonely).tw. or ((social adj2 alienat*) or isolat* or exclu*).tw.) **and** (((exp "Primary Health Care"/ or exp "Community Health Services"/ or exp "ambulatory care facilities"/ or exp "ambulatory care"/ or exp "home care services"/ or ("primary care" or "primary healthcare" or communit* or "integrated care" or "ambulatory care" or "social work*" or "home care" or "mental health service*" or domiciliary).tw. or "family practice"/ or "nurse practitioners"/ or "family physician"/ or "community health nursing"/ or exp "social work"/ or "Family Nursing"/ or "General Practitioners"/ or (primary or community).mp.) adj2 (provider* or professional* or clinician* or physician* or doctor* or nurs* or psychiatrist or practitioner*).tw.) or ("Social work*" or "family medicine" or "family practice" or GP or "family care team" or "family team").tw.) **and** (exp Aged/ or geriatrics/ or aging/ or ("older adult*" or "community-dwelling elder*" or elder* or "older people" or aged or aging or ageing or non-institutionalized or "community living individual*" or adult* or geriatric or "old population" or "chronic* ill patient*" or "chronic* patient*" or "frail elderly").tw.) [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]

CINAHL

((MH "Loneliness" OR MH "Social Isolation" OR TI (loneliness OR AB loneliness OR "living lonely" OR AB "living lonely" OR TI "living alone" OR AB "living alone" OR TI lonely OR AB lonely)) **AND** (MH "Primary Health Care" OR MH "Community Health Services" OR MH "ambulatory care facilities" OR MH "ambulatory care" OR MH "home care services" OR TI "primary care" OR AB "primary care") OR (TI "primary healthcare" OR AB "primary healthcare") OR (TI communit* OR AB communit*) OR (TI "integrated care" OR AB "integrated care") OR (TI "ambulatory care" OR AB "ambulatory care") OR (TI "social work*" OR AB "social work*") OR (TI "home care" OR AB "home care") OR (TI "mental health service*" OR AB "mental health service*") OR (TI domiciliary OR AB domiciliary)) OR (MH "family practice") OR (MH "nurse practitioners") OR (MH "family physician") OR (MH "community health nursing") OR (MH "social work"+) OR (MH "Family Nursing") OR (MH "General Practitioners") OR ((TI primary OR AB primary) OR (TI community OR AB community)) N2 ((TI provider* OR AB provider*) OR (TI professional* OR AB professional*) OR (TI clinician* OR AB clinician*) OR (TI physician* OR AB physician*) OR (TI doctor* OR AB doctor*) OR (TI nurs* OR AB nurs*) OR (TI psychiatrist OR AB psychiatrist) OR (TI practitioner* OR AB practitioner*)) OR ((TI "Social work*" OR AB "Social work*") OR (TI "family medicine" OR AB "family medicine") OR (TI "family practice" OR AB "family practice") OR (TI GP OR AB GP) OR (TI "family care team" OR AB "family care team") OR (TI "family team" OR AB "family team" **AND** (((MH Aged+) OR (MH geriatrics) OR (MH aging) OR ((TI "older adult*" OR AB "older adult*") OR (TI "community-dwelling elder*" OR AB "community-dwelling elder*") OR (TI elder* OR AB elder*) OR (TI "older people" OR AB "older people") OR (TI aged OR AB aged) OR (TI aging OR AB aging) OR (TI ageing OR AB ageing) OR (TI non-institutionalized OR AB non-institutionalized) OR (TI "community living individual*" OR AB "community living individual*") OR (TI adult* OR AB adult*) OR (TI geriatric OR AB geriatric) OR (TI "old population" OR AB "old population") OR (TI "chronic* ill patient*" OR AB "chronic* ill patient*") OR (TI "chronic* patient*" OR AB "chronic* patient*") OR (TI "frail elderly" OR AB "frail elderly")))

COCHRANE

((((mh Loneliness):ti,ab,kw OR (mh “Social Isolation”):ti,ab,kw OR (loneliness OR “living lonely” OR lonely):ti,ab,kw OR (social NEAR/2 alienat* OR isolat* OR exclu*):ti,ab,kw)) **AND** (((mh "Primary Health Care" OR mh "Community Health Services" OR mh "ambulatory care facilities" OR mh "ambulatory care" OR mh "home care services" OR ("primary care":ti,ab OR "primary healthcare":ti,ab OR communit*:ti,ab OR "integrated care":ti,ab OR "ambulatory care":ti,ab OR ("social" NEXT work*):ti,ab OR "home care":ti,ab OR ("mental health" NEXT service*):ti,ab OR domiciliary:ti,ab) OR mh "family practice" OR mh "nurse practitioners" OR mh "family physician" OR mh "community health nursing" OR mh "social work" OR mh "Family Nursing" OR mh "General Practitioners" OR ((primary:ti,ab OR community:ti,ab) NEAR/2 (provider*:ti,ab OR professional*:ti,ab OR clinician*:ti,ab OR physician*:ti,ab OR doctor*:ti,ab OR nurs*:ti,ab OR psychiatrist:ti,ab OR practitioner*:ti,ab)) OR (("Social" NEXT work*):ti,ab OR "family medicine":ti,ab OR "family practice":ti,ab OR GP:ti,ab OR "family care team":ti,ab OR "family team":ti,ab))) **AND** ((mh Aged OR mh geriatrics OR mh aging OR ("older" NEXT adult*):ti,ab OR ("community-dwelling" NEXT elder*):ti,ab OR elder*:ti,ab OR "older people":ti,ab OR aged:ti,ab OR aging:ti,ab OR ageing:ti,ab OR non-institutionalized:ti,ab OR ("community living" NEXT individual*):ti,ab OR adult*:ti,ab OR geriatric:ti,ab OR "old population":ti,ab OR (chronic* NEXT "ill" NEXT patient*):ti,ab OR (chronic* NEXT patient*):ti,ab OR "frail elderly":ti,ab))))

Supplementary material 2

Table 6. Key study characteristics

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Bleijenberg 2016 (34)	11 geriatric conditions and loneliness	Evaluate intervention effect on loneliness and other 10 geriatric conditions	835 participants across 39 general practices in Netherlands	Assessment loneliness at home by primary care nurse, tailored care plan, or referral to other services if needed	Primary care-home care-referral to specialized services if required	Family physicians involve ed in detection, specially trained primary care nurses led intervention and referrals	-Time-consuming aspects such as building trust, training nurses -Short time of the trial and large caseload for nurses affected the delivery
Bolton 2020 (78)	Social isolation	Explore experiences of participants in social isolation intervention "Circles of Support"	7 participants across 6 Integrated locality teams in UK	Assist discharged isolated patients to building social networks, navigate care system	Network of advocates hospitals, social care teams and agency AGE UK. Community health worker at social care teams act as nexus between hospital and home, refer to social care professional, befrienders, primary care centres or other	Community health worker in Integrated Locally Teams act as gatekeeper. Social care professional stablished support system. Volunteer navigators and befriender build network	+Receiving public funding to create an integrated care network -Lack befriending volunteers - Short-term involvement of professionals after generating attachment with the participants
Borji 2020 (67)	Loneliness	Assess effect religious intervention on subjective vitality and sense of loneliness	110 participants unspecified number or community health centres in Iran	Address loneliness through group religious intervention	No network. Within community health centres	Community nurses detected patients and delivered the interventions	Not reported

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Carnes 2017 (73)	Social isolation + primary care frequent attenders	Evaluate implementation and outcomes of social prescribing intervention	381 participants across 22 primary care practices in UK	Appoint social prescribing coordinators in primary care centres which referred patients to community	Social Prescribing (SP) scheme. Primary care- SP coordinator (link) refers to community organizations and services	Family physicians detected patients and referred them to social prescribing coordinator trained in social work which recommended tailored community organizations, services or volunteers. Trained volunteers assisted in the delivery of the service and provided additional support	+ Link professionals dedicating time to explore participant needs leading to positive outcomes -Participant's lack of understanding and perceived need for the intervention, overwhelmed by other health needs and logistical problems
Coll-Planas 2017 (55)	Loneliness	Explore feasibility of intervention and short-long term effects on loneliness	38 participants across three primary care centres in 2 urban areas in Spain	Map assets, create network, training primary care professionals and volunteers to deliver multifaceted group program	Social Prescribing scheme. Network between primary health care centres and community assets in the neighbour	Primary care nurses, physicians and social workers detected, referred patients and trained volunteers. Volunteers were older people from senior centres, which introduced lonely patients to community assets	+Professionals, volunteers, and community assets as key bonding elements for long-term social contacts -Limited time availability might lessen the participation of volunteers
Conwell 2020 (56)	Mental health conditions and loneliness	Evaluate companionship to older primary care patients effect on clinical outcomes	369 participants from national network community-based social service agency in USA	Address loneliness through trained volunteer peer companionship including befriending and peer mentoring	No network. Primary care recruitment and Aging Services Network provide intervention	Peer companion volunteer provided by the ASN agency were linked to primary care patients by the agency	+Volunteers are perceived as closer to the participants. +Low intervention cost due to the involvement of volunteers, facilitating dissemination

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators+ and barriers-
Daban 2021 (32)	Social isolation	Evaluate intervention impact on health outcomes	147 older adults isolated due to movement restrictions or architectural barriers in 5 deprived neighbourhoods, Spain	Address social isolation by carrying out outdoors outings facilitated by volunteers	Primary care teams collaborate with public health community care teams	Primary care and social care clinicians plus community workers detected patients isolated and enrolled volunteers	Not reported
Diez 2014 (70)	Social isolation	Evaluate intervention "let's go down to the street" outcomes	74 participants, setting no disclosed, Spain	Address social isolation through professionals and volunteers that facilitate assisted overcome architectural to attend community activities	Primary care teams collaborate with public health community care teams	Primary care and social care clinicians plus community workers detected patients isolated and enrolled volunteers	Not reported
Franse 2018 (65)	Frailty, falls, loneliness polypharmacy	Explore effects of a preventive health social care intervention	1215 participants in intervention group, 1110 control group across primary care settings in 5 European cities (Greece, Croatia, Netherlands, Spain, UK)	Create coordinated pathway including first assessment, shared decision making with care coordinator and physician, referrals to activities or support group	Social Prescribing scheme. Primary care centres gatekeeper, referral to community assets	Family physician and care coordinator referred patients to care pathway to connect with community assets. Care coordinator monitored progress and physician follow up on patients if needed	+Professionals having previous trust relationship with participants -Parts of the intervention time consuming for the professionals -Health and mobility problems of participants can be barrier to engagement

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Hernandez-Ascanio 2020 (72)	Social isolation and loneliness	Study protocol ongoing intervention to evaluate intervention effect on health outcomes	57 participants across 6 primary care centres in Spain	Assessment and creation of tailored plan, referring to different activities	Primary care clinicians detect, refer cases to supervised volunteers, that delivered intervention at home or over telephone	Family physicians detected, referred patients and supervised volunteers. Volunteers delivered intervention at home or telephone	Not reported
Honigh-de Vlaming 2013 (62)	Loneliness	Evaluate effect of an intervention to reduce loneliness in the high-risk groups, and create awareness	1350 participants, setting no disclosed, Holland	Implement integrated intervention to create awareness and refer patients to psychosocial interventions, social activation by community based neighbours.	Community intervention formed by regional community health service, local elderly welfare organization and municipality. Includes general practitioner referral	Community care nurses, municipal advisors and volunteers were involved but role is unclear	Not reported
Howarth 2020 (71)	Social isolation, loneliness, anxiety, and well being	Evaluate intervention outcomes	47 participants, setting no disclosed, UK	Create intervention to refer patients to co-created therapeutic garden	Social Prescribing scheme. community nurses refer patients to link worker that connect with therapeutically garden	Community nurses detected and referred patients to link worker, link worker connected them to the services provided follow up	+Co-creation of the therapeutic garden with the collaboration of multiple organizations -Interventions rely on donations, grants, and awards due to lack of funding

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators+ and barriers-
Juang 2020 (74)	Loneliness	Explore feasibility, acceptance, and outcomes intervention RESOLV	32 participants from 1 veteran affairs health care setting in USA	Community based telephone activity for patients and veterans, to engage in over hundred social group activities through phone	Veterans affairs facilities link patients with community organization that delivers program	Veteran facilities psychologist, social workers, nurses and physicians detected and referred patients to trained social worker facilitators or volunteers, who provided instructions to enroll in telephone program	+Existing community network based on partnerships made the intervention sustainable. -A perceived lack of fit with other group members or activities; poor phone connection; hearing difficulties; poor health and memory; affected participation -Considering living alone as loneliness hinder detection those in need
Kellezi 2019 (36)	Chronically ill patients experiencing loneliness	Assess degree social cure model captures experiences of healthcare staff and patients in social prescribing interventions	2630 participants in 1 social prescribing pathway in UK	Address loneliness through clinicians' referral to link person who assess, check patient progress, accompanies him first meeting community groups	Social Prescribing scheme. Primary care clinicians refer patients to health coaches and link workers that connect them with third sector groups	Family physicians and practice nurses in primary care referred patients to health coaches or link workers that assessed needs and referred them to third sector groups	+Existing community network and pathways help GP address loneliness +Long visit with link workers favours participation + Having the link worker inside the GP practices facilitate pathway referrals, visibility and engagement -Short time visits with GP limits addressing social needs -Limited understanding of pathways by GP poor feedback of patients after referral -Isolated individuals can feel fear towards group participation -Lack of match between the group, participants, and the activities

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Khan 2020 (57)	Social isolation	Explore participant experiences in a group-walking intervention	12 participants in 1 primary care centre in UK	Address social isolation through a single community walking intervention.	No network, within primary community care	Family physician resident detected patients and led the activity	-Not knowing anyone in the group and limitations to walk related to decreased physical condition affected engagement
Kruithof 2018 (69)	Mild intellectual disabilities, indirectly social isolation and loneliness	Explore experiences of participants involved in communal table intervention	19 participants across undefined city districts in Netherlands	Creation of monthly dinners to enlarge social networks for socially isolated people with mild intellectual disabilities	No network, within primary community care	Social worker and three volunteers led the intervention	+Low fees ensured equity +Tailor interventions to pre-existing social networks and motivations -Large groups and lack of professional support facilitating socialization lowered attendance -Fear to meet new people
Lapena 2020 (61)	Social isolation and loneliness	Explore participants' and organisers' perceptions of the implementation 'School of Health' intervention	26 participants across 2 neighbourhoods in Spain	Intervention to promote resources and encourage participation in community. Volunteer experts informed about community assets ,conducted visits and provided tools to improve social network	Social Prescribing scheme. Primary care clinicians refer patients to nurse coordinators that connect patients with community assets	Primary care clinicians detected and referred patients to community nurses who coordinated volunteers, supervised sessions, and accompanied participants to avoid fear rejection. Key agent volunteers led interventions	+Program coordinators with high interpersonal skills accompanying patients to interventions lowered fear +Accessible location, adapted frequency, schedule and duration of intervention +Adapting to attendant impairments +Previous trust relation with coordinators +Low cost intervention using existing health assets and volunteers -Ageing decline hindered participation -Professionals work overload

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Mays 2020 (31)	Social isolation and loneliness	Evaluate intervention's effect on outcomes	464 participants age 50 years or older. USA	Intervention to refer individuals to Evidence-Based-Practice activities (Arthritis exercise program, Enhance Fitness, Tai Chi for arthritis, Chronic Disease Self-Management)	Primary care providers referred individuals to Area Agencies on Aging, which provided Evidence-Based-Practice activities	Different primary care professionals (i.e. Primary care physicians, nurse practitioners, pharmacist, social workers and case managers placed referrals.	+Direct referrals to program through shared EMR +Program coordinator embedded in the health care system to enroll participants associated with decreased loneliness and social isolation
Moffat 2017 (64)	Long term condition. Social isolation loneliness no primary focus	Explore feasibility and experiences patients referred to link worker	30 participants across 12 primary care centres in UK	Referrals from primary care to link worker that connected patients with community voluntary groups	Social prescribing scheme. Primary care clinicians refer to link worker that connects patient with voluntary sector organizations	General practice clinicians referred patients to link worker that visited patients, built trust, provided health education, and referred patients to voluntary sector organizations. Link worker accompanied participant to activities	+Length of the program facilitate engagement +Interpersonal skills facilitate building trust with link workers +Link workers accompanying participants to the activities eases entrance to new groups

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators+ and barriers-
Mulligan 2020 (38)	Depression, anxiety,loneliness and social isolation	Evaluation social prescribing intervention	1101 clients across 11 community health centres in Ontario, Canada	Enabling a system of referrals from primary care to community assets either directly or through a navigator	Social Prescribing scheme. Primary care clinicians refer participants to community organizations	Family physicians, nurse practitioners, and interprofessional team members (i.e. Nurses, dieticians, social workers, community support workers and .occupational therapists referred participants	+Internally run and cost-free groups had fewer barriers to participation +Health care professionals accompanying participants to the first session +Involving Health Champions and navigators with strong communication skills +Asset mapping useful in small and rural centres +Shared electronic medical record facilitated evaluation +Standardizing documents across participating centers -Lack of dedicated navigator and follow up after referral.
Ozic 2020 (68)	Frailty, prevention falls and loneliness	Evaluate effect of intervention on health outcomes	410 participants, setting no disclosed, Croatia	Preventive integrated health and social care public health intervention that provided education and workshops for older population	No network. Within home care service	Community nurses detected patients, helped university research team to create interventions, provided follow ups and participated in interventions	Not reported

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Rodriguez-Romero 2020 (60)	Loneliness	Evaluated intervention effect on social support and quality of life	55 participants in an urban area in Spain	Involve patients in health, well being and networking group activities such as health promotion and prevention, third sector, private entities, social workers	Social prescribing scheme. Primary care clinicians refer patients to health coaches and link workers that connect them community assets and activities	Nurse practitioner and physician detected and recruited, NP led the intervention which involved PHC nurses, family physicians, social workers, neighbourhood community agents, private entities and third sector	+Network between civil, social, religious organizations, and volunteering for elderly at the local level +Personalized follow up by nurse facilitated engagement +Longer length intervention facilitated socialization and positive outcomes
Routasalo 2009 (59)	Loneliness	Evaluate effect of intervention on health outcomes	235 participants across 7 community centres and 6 communities in Finland	Psychosocial group intervention for older adults experiencing loneliness	No network, within primary community care	Registered nurse, occupational therapist and physiotherapist led detection and delivery of the intervention	Not reported
Sadarangani 2019 (79)	Chronic conditions, loneliness as outcome measure	Evaluate health intervention effect on health outcomes and explore stakeholders experiences	126 participants across 12 adult day centres in USA	Inclusion of registered nurse navigator that increases assessment social needs through home visits and facilitate care transitions	Primary care clinicians + community based health home service supports adult day health centres	Registered nurse navigator performed at-home assessments of high-risk individuals, facilitated care transitions. Worked with registered nurses, physical therapists, occupational and social workers, speech pathologist, dietitian, in coordination with physician	Not reported

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators+ and barriers-
Savikko 2010 (58)	Loneliness	Evaluate processes and mediating factors of a group rehabilitation intervention	117 participants across community regions rehabilitation and therapy centres in Finland	Psychosocial group rehabilitation intervention through groups activities such as exercise or therapeutic writing	Researchers and rehabilitation centres clinicians connect patient with community assets like cultural events or art	Registered nurses, occupational therapists and physiotherapist led the detected patients and led intervention groups	+Participants free to choose the group in which to participate, based on shared interests improved results +Provide transportation for the participants
Taube 2018 (63)	Loneliness, symptoms of depression and life satisfaction	Evaluate effects of a case management intervention	153 participants across 3 university hospital clinics and 3 primary care centres in Sweden	Case management intervention with Registered Nurse case managers and physiotherapist to detect and address frail adults focusing also on loneliness	No network, detection and referral from clinical settings primary care, hospital and home care, and intervention from same clinicians	Primary care clinicians recruited patients. Case managers registered nurses and physiotherapists delivered intervention	-Lack of standardized or explicitly strategy when intervening against loneliness led to lack of effectiveness
Theeke 2015 (75)	Loneliness	Explore initial feasibility and acceptability of the LISTEN intervention	27 participants in a university based family medicine centre in USA	Psychosocial group intervention delivered in sessions, including topics as perceived belonging or establishing meaning in loneliness	No network, recruitment in primary care by searchers and delivery in primary care settings	Not disclosed	+Facilitate access by parking accommodation, adaptation of spaces for people with disabilities +Right length of activities +Accompany the participants to the first activities +Social skills of the professionals (i.e., good listener, nonjudgmental) +Weekly reminders to participants -Long distance to activities

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Thomson 2020 (77)	Mental health users, social isolation as outcome	Assess a combined arts- and nature-based museum intervention effect on health outcomes.	46 participants from unspecified mental and social services in UK	Intervention to refer patients by community health nurses from mental health social services to horticulture and arts-based activities with volunteers	Social Prescribing scheme. Detection in local mental health and social services and referral patients to community activities horticulture and arts based	Community mental health nurse detected at risk patients and referred them to the activity	Not reported
Van Der Heide 2012 (76)	Loneliness	Investigate CareTV intervention effectivity	120 participants in 1 home care organization in Netherlands	Implementation of a technological system that allows the patient to connect via video voice with carers, family and friends from their home	No network, home care organization- homes technological intervention	Private home care agency installed technology. Nurse practitioner was connected with patient through technological system	-Difficulties using the technology by older adults
Vogelpoel 2014 (66)	Impaired sensory older people experiencing social isolation	Describe the benefits of a social prescribing service	12 participants across 1 general practice and voluntary organization in UK	Integrated services, arts based activities and voluntary sector support, homogenous group experience similar challenges to promote cohesiveness and indirect support from peers	Social Prescribing scheme. Detection and referral by physicians connecting patients to community organization	Family physician identified and referred participants with sensory impairment to a volunteering third sector organization	+Regular contact between coordinator and participants +Reminders of transport arrangements and upcoming events. +Providing transportation (i.e., community transport, taxis, buses) +Centre adapted to disabilities and sensorial impairments +Staff and volunteers accompany participants help overcome the initial fear of being outside home

Study	Focus	Aim	Sample and setting	Intervention description	Intervention primary care network schemes	Role of health care professionals	Facilitators^{+} and barriers^{-}
Walters 2017 (26)	Social conditions in older people, including social isolation and loneliness	Test feasibility and costs of using technological tools HRA-O and SWISH risk appraisal system	454 participants across 5 general practices in UK	A comprehensive report is generated and shared with primary care practitioners. Include ageing advice, signposting to national and local resources	No network, technological intervention	Family physician detected and invited participants, external agency installed technology to assess social risk, uploading evaluation and care plan into medical records. Patients were then followed by physicians and nurse practitioners	Not reported
Weiskittle 2021 (33)	Social isolation	Evaluate feasibility and acceptability of an intervention to address social isolation among older Veterans	21 Clinicians across 3 Veteran primary care integrated care settings, USA	Telehealth based intervention to address social isolation in the context of chronic underlying mental health needs of older Veterans during COVID-19 pandemic	No network, technological intervention	Clinical psychologists, social worker, psychology trainees delivered telehealth psychological support (i.e., Acceptance and Commitment Therapy, Problem-Solving Therapy, Cognitive Behavioural Therapy (CBT)	-Technology use complicated and challenging, specially among functionally impaired individuals -Brief recruitment period

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	#1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	#2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	#4-6
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	#6
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	#7 Registration: https://osf.io/m3k8f Protocol file: https://osf.io/63nkq/
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	#8
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	#8
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	#supplementary material 1
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	#8 and Figure 1
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	#8-9
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications	#7-8

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
		made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	#NA
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	#8-9
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	#9 and Figure 1
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	#9 Table 1 and supplementary material 2
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	#NA
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	#9-18 and Table 2-5 and supplementary material 2
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	#9-18 and supplementary material 2
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	#18-21
Limitations	20	Discuss the limitations of the scoping review process.	#21
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	#22
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	#23

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable

to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.