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Publication date	11-06-2024
Original Citation	O'Sullivan, D. J., Bearne, L. M., Harrington, J. M., Cardoso, J. R. and McVeigh, J. G. (2024) 'The effectiveness of social prescribing in the management of long-term conditions in community-based adults: a systematic review and meta-analysis', Clinical Rehabilitation, 38(10), pp. 1306-1320. https://doi.org/10.1177/02692155241258903
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1177/02692155241258903
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The effectiveness of social prescribing in the management of long-term conditions in community-based adults: A systematic review and meta-analysis

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Abstract

Objective: The objective of this systematic review and meta-analysis was to evaluate the effectiveness of social prescribing interventions in the management of long-term conditions in adults.

Data sources: Eleven electronic databases were searched for randomised and quasi-randomised controlled trials.

Review Methods: Outcomes of interest were quality of life, physical activity, psychological well-being and disease-specific measures. Bias was assessed with the Cochrane Risk of Bias 2 tool. A narrative synthesis and meta-analysis were performed.

Results: Twelve studies ($n = 3566$) were included in this review. Social prescribing interventions were heterogeneous and the most common risks of bias were poor blinding and high attrition. Social prescribing interventions designed to target specific long-term conditions i.e., cancer and diabetes demonstrated significant improvements in quality of life ($n = 2$ studies) and disease-specific psychological outcomes respectively ($n = 3$ studies). There was some evidence for improvement in physical activity ($n = 2$ studies) but most changes were within group only ($n = 4$ studies). Social prescribing interventions did not demonstrate any significant changes in general psychological well-being.

Conclusion: Social prescribing interventions demonstrated some improvements across a range of outcomes although the quality of evidence remains poor.

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Keywords
Social prescribing, long-term conditions, community link-worker, community health worker, self-management

Received August 18, 2023; accepted May 16, 2024

Introduction

Long-term conditions are lifelong health problems, which tend to be managed through medication and other therapies.[1,2]. Though long-term conditions lack a universal definition[3] it is acknowledged that long-term conditions may present as individual or multiple diseases co-existing simultaneously[4] significantly impacting both physical[5,6] and mental wellbeing[7,8] and are associated with increasing age, female gender, lower income class and poor social network.[9] Patients with long-term conditions have poor quality of life,[10,11] reduced ability to work,[12] greater dependence on hospital services[13] and experience premature death.[14] Healthcare providers are encouraged to adopt patient-centred models of care for individuals with complex multimorbidity[15] to prevent the treatment burden that accompanies fragmented delivery of poorly coordinated single-disease models of care.[16]

Social prescribing is an innovative person-centred approach[17] to help individuals from socioeconomically deprived areas address the biopsychosocial factors associated with long-term conditions[18] and improve their quality of life[19–21] by linking patients in primary care with existing tertiary support services in the community.[22,23] Social prescribing may complement existing medical management by incorporating both horizontal and person-centred integration models of care.[24] A social prescription involves the referral of individuals by medical and allied health practitioners to non-clinical laypersons called 'Community link-workers' or 'Community health workers', who collaborate with these individuals to identify purposeful goals and co-design a social prescribing pathway involving relevant community-based support schemes.[19,25–28] For the purpose of this review, non-clinical laypersons, recruited from the local community (that do not have existing health care qualifications) will be referred to as community link-workers. Social prescribing pathways vary from light touch signposting for housing and financial needs[29] and community groups referral for art therapy or exercise therapy[30,31] to more intensive pathways offering increased community link-worker support to address the complex needs of individuals with long-term conditions.[19]

Participants of social prescribing initiatives have reported improvements in numerous health domains, for example: Increased self-esteem;[32] increased sense of control and empowerment;[30,32] improvements in psychological well-being;[33] reduction in anxiety and/or depression;[34] and improved physical health and lifestyle.[35] Previous systematic reviews exploring the effectiveness of social prescribing have highlighted the heterogeneity of the methodological approaches across the research. Uncontrolled before and after studies; lack of comparative controls; patients lost to follow up and inappropriate outcome measures for the population of interest are reported as limiting factors influencing the strength of the findings.[19,25] Furthermore, previous systematic reviews were limited to specific countries[19,25,36] or had a singular focus on particular outcomes of interest[37] and population.[38] This current systematic review will bridge this gap in the evidence by including only randomised/quasi-randomised controls, from different geographical regions, focusing on outcomes that reflect the multifactorial nature of long-term conditions. Given the limitations of the literature to date, the aim of this systematic review and meta-analysis was to determine the effectiveness of social prescribing in the management of long-term conditions in community-based adults.

Methods

A systematic review of the literature was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement.[39] The protocol for this review is registered with Open Science Framework https://osf.io/p5vf9/.

Study design

A systematic literature review of randomised and quasi-randomised controlled studies assessing the effectiveness of a social prescribing intervention on community-based adults with long-term conditions, utilising a 'Community link-worker' or 'Community health worker' was performed. A narrative synthesis was conducted on the identified studies and a meta-analysis performed on those studies that reported haemoglobin A1C (HbA1c) levels in diabetes.

Data sources and search strategy

A comprehensive literature search (Supplementary Material #1) of electronic databases was conducted from inception until November 2022 and updated in December 2023. Databases searched were: MEDLINE and MEDLINE in Process (via Ovid), EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), Cumulative Index to Nursing and Allied Health Literature (CINAHL), EU Clinical Trials Register, LILACS (Latin American and Caribbean Health Sciences Information Database), Scopus and AgeINFO. Trial registries including Clinicaltrials.gov, WHO trials search (ICTRP) and Trials Register of Promoting Health Interventions (TRoPHI) were also searched. The search was supplemented by hand-searching relevant journals and citation tracking. The Grey literature was searched using Irish Health Service Executive (HSE) Lenus, RIAN, Open Grey and World Health Organization Library Information System (WHOLIS).

Inclusion and exclusion criteria

To be included studies had to be randomised or quasi-randomised controlled trials incorporating a social prescribing model with a non-clinical community-based link-worker, recruited from the community, without a previous qualification in medical or health sciences or already working in a professional clinical role. The social prescribing interventions had to be community-based using a health promotion approach defined by the Social Prescribing Network Conference Report for Long-term Conditions in Community-Dwelling Adults.[34] Any long-term conditions appropriate for a social prescribing intervention could be included in this review (for example, diabetes mellitus, stroke, asthma, depression, chronic obstructive pulmonary disease, chronic kidney disease, hypertension, inflammatory arthropathies, irritable bowel syndrome, obesity, cardiovascular disease, low back pain, progressive neurological disorders, and cancer). Interventions could be face-to-face or remote. Outcome measures of interest were quality of life, physical activity, psychological well-being, and disease-specific measures. Only studies published in English were included and participants had to be at least 18 years.

All studies identified from the search strategy were exported to Covidence software.[40] After study duplicates were removed an initial screening of titles and abstracts was conducted independently by two authors (DJOS and JGMcV). Full text of suitable studies was obtained and independently screened against the inclusion criteria. Studies meeting the inclusion criteria were independently reviewed with any disagreements between the two reviewers arbitrated by a third reviewer (JH).

Data extraction

A data extraction template was developed a priori and trialled with one study. Study characteristics captured included author, year of publication, patient demographics (age, gender) and background, intervention, control, duration of the intervention, primary and secondary outcome measures, results. A further characteristic of the intervention table was also made. Both original tables may be found in the supplementary materials file.

Methodological quality evaluation and risk of bias

The methodological quality and reporting standards of this review were constructed using the Cochrane Collaboration's tool for assessing risk of bias in randomised and quasi-randomised trials (RoB2).[41] The Rob2 tool is structured into five domains[37] including; bias arising from the randomisation

process; bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement outcome; bias in selection of the reported outcome. Risk of bias was assessed independently by two reviewers (DJOS, JGMcV) and differences resolved by discussion with a third researcher (JH). A judgement was made on each study as being low, high, or unclear risk of bias.

Data synthesis

Summary data on the study characteristics and the study interventions (Table 1) were extracted and presented in tabular form, (primary study characteristics table and primary intervention table are available in Supplemental materials). A narrative synthesis was conducted, and the data was explored to interpret the relationships in the data within and between studies. Data was analysed to determine the impact of variability in study designs, populations and outcome measures. A meta-analysis, was performed on four of the 12 included studies using the Hartung-Knapp-Sidik-Jonkman [42] random-effects method and illustrated graphically (Figure 2). The standardised mean difference and 95% confidence interval (95% CI) were used to analyse the effect of the community link-worker intervention on HbA1c in diabetes, when comparing community link-worker interventions to the control group. Where necessary, authors were contacted to solve possible uncertainty of effect size and RoB2 interpretations. To assess between-study variance we used tau-squared (the variance of true effects). The I^2 statistic was then used to determine any inconsistencies within the data. These statistical analyses were performed using IBM SPSS Statistics (Version 29).[43] Statistical significance was set at 5%. Sensitivity analyses were performed by removing the study with the highest 'weight' for each cluster.

Results

Electronic searches identified 5807 potential studies. After duplicates were removed ($n = 444$), 5363 studies were screened for title and abstract content of which 191 studies were eligible for full text screening ($n = 3566$). Two reviewers (DJOS, JGMcV) independently assessed the eligibility of these studies and 12 studies were selected for this review. An updated search of the literature was conducted in December 2023 but did not identify any further studies. Figure 1 outlines the PRISMA flow chart.

Study characteristics

The selected studies were conducted in the United States of America ($n = 9$),[44,46,53,54] United Kingdom ($n = 1$),[47] Belgium ($n = 1$)[55] and Australia ($n = 1$)[52] and were heterogeneous in design. Cancer ($n = 1$)[46] and diabetes ($n = 7$)[48–54] were the main long-term conditions identified. Comparison groups included waiting list[52] usual care,[45,47,48,51,54,55] enhanced care,[46,49,50] or delayed access to the intervention.[44,53] Study duration ranged from 8 weeks[55] to 18 months[49,52]. The total number of participants included in the 12 studies was $n = 3566$, (female $n = 2179$, male $n = 1387$) with a mean age of 48 years.

Risk of bias

Overall, nine studies were judged to have a high risk of bias[44,45,46,47,49,52–55] and three studies were judged to have low risk of bias.[48,50,51] The 'measurement of the outcome' presented as the greatest risk of bias in eight studies and the 'missing outcome data' domain had the lowest risk of bias in all 12 studies, supplementary material. There was moderate level of agreement between the two independent reviewers' risk of bias judgements using the Kappa coefficient ($K = 0.488$).

Risk of bias summary judgements and judgements on outcome domains are available in supplementary materials.

Intervention characteristics

Community link-workers led the intervention in all included studies and were recruited from the community of interest. The duration of community link-worker training ranged from 4[55] to 160 h.[49] The social prescribing interventions utilised in the included studies were grounded in behavioural change theoretical frameworks and behavioural models such as social cognitive theory[45,46] self-

Table 1. Characteristics of the study and social prescribing intervention.

Study	Theoretical domains & constructs	Link worker training	Link worker backgrounds	Services provided	location, duration & follow ups	Intervention delivery& mode
1. Gray et al.[44]	Shaping knowledge, feedback and monitoring, goal setting, social support, advocacy, navigation	40 h of comprehensive training, including didactic sessions, In-class exercises and field practice. Health coaching and motivational interviewing.	High school or equivalent degrees and 5–8 years of experience as CLWs,	Education, social support, informal counselling, linkages to community resources, blood glucose monitoring, healthy eating, physical activity, smoking cessation	Home based, community resource locations Follow up: 12 months	CLWs meetings 0.5, 1.5, 3.5,7, 10-month Total interventions: At least four CLW visits. Mode: Face to Face
2. Bossche et al[45]	Social support, coaching, advocacy, navigation	2 online training modules of 2 h with entailed communication skills, signposting	NR	Presence to patients who were socially isolated or who felt lonely or anxious, information on social distancing, navigation to healthcare	Community sites 8 weeks duration Follow up: 8 weeks	8 contacts for 2 h per over 8 weeks Total interventions: NR Mode: Telephone, text, e-mails, park walks
3. Ramirez et al[46]	Community-based participatory research methods drawing on theoretical frameworks; social cognitive theory, stress and coping theory, health behaviour change	NR	NR	Social work and psychosocial services referrals, child /elderly care, transportation, financial services; appointment follow-up, fertility education, onward referral to community	Community sites 12 months duration Follow up: baseline, 3, 9, 15 months	PN-LCNS group 2.70 times; LCNS 2 times. PN-only survivors 2.69 times, 3 PN-only survivors accessed the LCNS services Total Interventions: NR Mode: Telephone
4. Mercer et al[47]	The Glasgow Deep End Links Worker Programme; theory of community-oriented primary care	NR	NR	Forge relationships between general practices and community organisations, and support patients to access the nonmedical services and encourage self determination	Clinics, home, Community sites 9 months duration Follow up:9 months	As required Total interventions: 868 Mode: One to one, face to face, telephone
5. Kangovi et al[48]	Participatory action research framework within the domains of coaching, social support, and advocacy	One month-long training that covers topics such as action planning and motivational interviewing.	High school diploma	Helped patients identify long-term supports, -facilitated exercise, social services; sourcing lower cost medication; referral to mental health care/ drug addiction	NR 6 months duration Follow up: baseline, 6, 9 months	Min 24 contacts; Total interventions: NR Mode: Individualised or group face to face; telephone
6. Spencer et al[49]	Community-based participatory research grounded in empowerment method to facilitate self-directed behaviour change	CLWs underwent 160 h of CLW training; 80 h of diabetes education; trained in empowerment-based Approaches; motivational interviewing and goal setting.	Spanish-fluent Latinas who had completed high school or had a GED	Improve communication skills, referrals to other service systems; set goals using the five-step goal-setting model	Community site 6 months duration Follow up: baseline, 6,	11 × 2-h sessions every 2 weeks; 2 × 60-min home visits monthly; phone calls Total interventions: NR Mode: Individualised, group face to face;

(Continued)

Table 1. (Continued)

Study	Theoretical domains & constructs	Link worker training	Link worker backgrounds	Services provided	location, duration & follow ups	Intervention delivery& mode
					12, 18 months	
7. Carrasquillo et al[50]	Community-level framework of chronic care model; self-management support; clinical information; healthcare organisation and community resources	75-h training curriculum, type 2 diabetes clinical and behavioural interventions (20 h), including motivational interviewing training; basic research methods on human participants research (20 h); insurance navigation	Lead CLW were non-medical staff; CLW supervisor – MSc qualification	Health education, medication refills, health coaching; assisted with nonmedical services; housing, employment, legal, financial, food resources; linkages to community services, Bimonthly exercise groups.	Home; clinic; Community 12 months duration Follow up: baseline, 12 months	4 home visits, 12 calls during the 12 months & bimonthly exercise groups in parks Total interventions: home visits received- 5, Telephone calls- 20; Participants (126 (84%) received 12 CLW contacts per year Mode: Individualised, group face to face
8. Kangovi et al[51]	Individualised intervention to help low-income patients achieve health goals within the domains of coaching, social support, advocacy	Month-long college accredited training covering topics such as action planning and motivational interviewing. CLWs had on-the-job training with a senior CLW.	Recruited from community Qualifications: NR	3 stages: action planning, tailored support, and connection with long-term support, Weekly patient support group	Home; community 6 months duration Follow up: baseline, 6, 9 months	38.4 h with each patient over the 6-month intervention period. 35% had 3 meetings Total interventions: NR Mode: Face to face; group classes
9 .McDermott et al[52]	Diabetes case management approach by local community-based health workers supported by indigenous teams	Intensive 3-week training in diabetes and self-management skills, advice on medications, routine foot care, nutrition, smoking cessation	Recruited from community NR	Keep appointments, medications adherence effects of smoking; work with the family to support the patient in self-management.	Home; clinic 18 months duration Follow up:18 month	Delivery: NR Total Interventions: NR Mode: Individualised face to face
10. Spencer et al[44]	Using a socioecological model, family, health system, and community-level interventions were developed to address sources of diabetes disparities at each level	CLW were underwent more than 80 h of training in empowerment-based approaches; self-determination and autonomy motivation theory and interviewing	Ethnically matched with their assigned participants Qualifications: NR	Physical fitness activity- dance, walking); weekly community farmer's market; self-management skills; facilitated necessary referrals to other services	Home; community sites; clinic 12 months duration Follow up: baseline, 6, 12 months	Home visits (2 per month, 60 min); 11 culturally tailored 2-h sessions every 2 weeks; Daily calls every 2 weeks Total interventions: NR Mode: Individualised, group face to face
11.Spencer et al[53]	Using a socioecological model, family, health system, and community-level interventions were developed to address	CLW were underwent more than 80 h of training. CLW were trained in empowerment-based approaches including self-determination and	Ethnically matched with their assigned participants Qualifications: NR	Trained CLWs, known in this study as family health advocates, promoted healthy lifestyle and diabetes self-management activities as	Home; community resource locations; clinic	Home visits (2 per month, 60 min);11 culturally tailored 2-h group sessions of 8–10 participants every 2 weeks in community: Daily calls

(Continued)

Table 1. (Continued)

Study	Theoretical domains & constructs	Link worker training	Link worker backgrounds	Services provided	location, duration & follow ups	Intervention delivery& mode
	sources of diabetes disparities at each level	autonomy motivation theory and interviewing		part of the 'Reach Detroit Community program'	12 months duration Follow up: baseline, 6 months	every 2 weeks Total interventions: NR Mode: Individualised and group face to face; telephone
12.Babamoto et al[54]	Cultural intervention composed of diabetes education and evaluated health behaviours	6-week training curriculum on roles and responsibilities, diabetes standards, self-management strategies incorporating patient cultural and spiritual beliefs, health behaviour change theory	High school degree or a GED degree Layperson recruited locally.	10-week ADA sessions tailored to needs; knowledge, identified problems, goals, and level of progress; routine follow-up calls to monitor self-management progress, review barriers	Home; clinic 6 months duration Follow up: baseline, 6 months	Weekly individual ADA educational sessions Total interventions: 11.3 mean Mode: Telephone; face to face

CLW: community link worker; NR: not reported; PN-LCNS: Patient Navigation-Livestrong Cancer Navigation Services; PN: patient navigation; PL: peer leader; EUC: enhanced usual care; ADA: American Diabetes Association; GED: general educational development test.

regulation theory[45]; stress and coping theory and health behaviour change theory.[46] The attrition rate across all studies was generally high and ranged from 9% to 29%. The characteristics of each study and the social prescribing intervention are summarised in Table 1.

Outcome measures used in the social prescribing intervention

Forty-one different outcome measures (self-reported, $n = 33$) were used to determine the effects of a social prescribing intervention on primary and secondary outcomes. The duration of social prescribing interventions ranged from 8 weeks[55] to 18 months.[49,52] Outcomes of interest were categorised as quality of life ($n = 12$), physical activity ($n = 2$), psychological wellbeing ($n = 8$), disease-specific outcomes ($n = 17$) and uncategorised ($n = 2$).

Effect of the social prescribing intervention on quality of life outcomes

There are short to long-term improvements in quality of life for those receiving social prescribing interventions,[46] particularly for those attending more

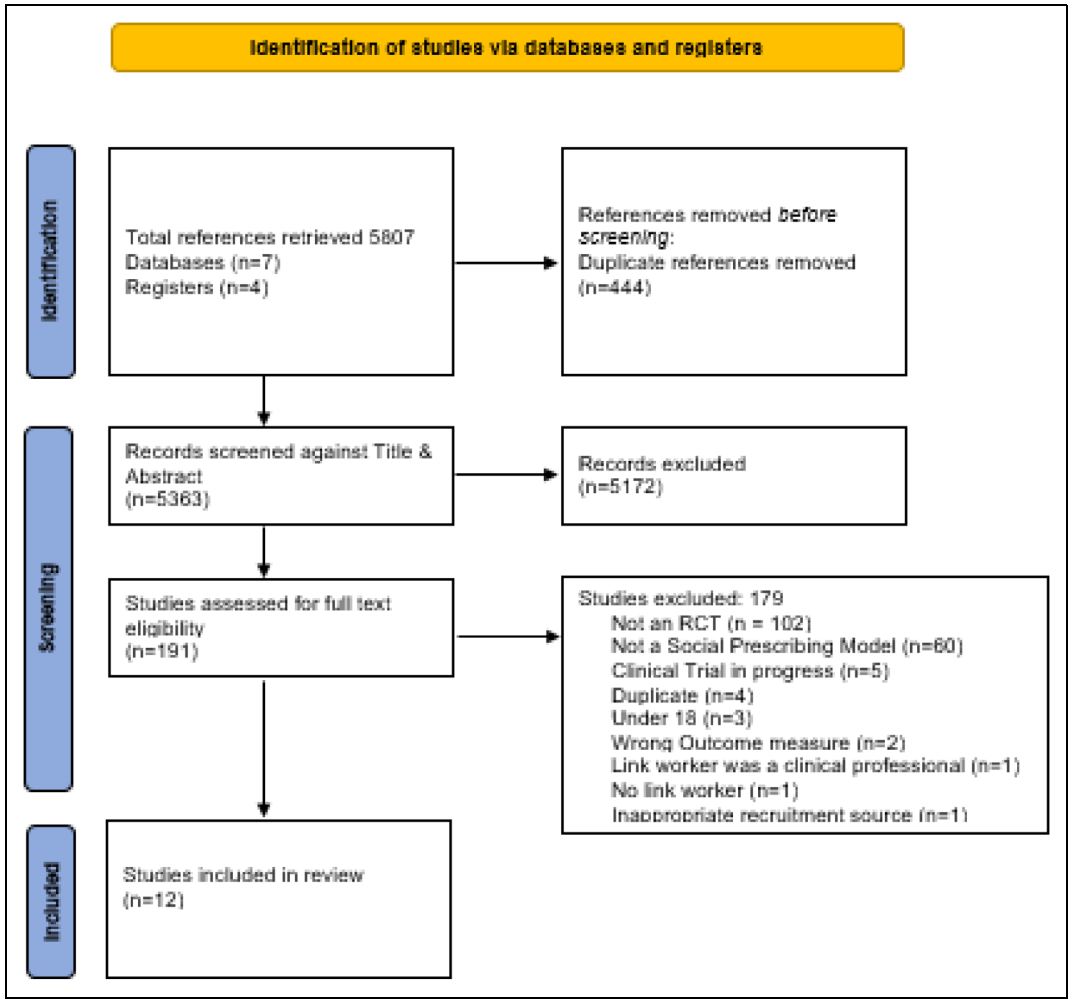


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow diagram.

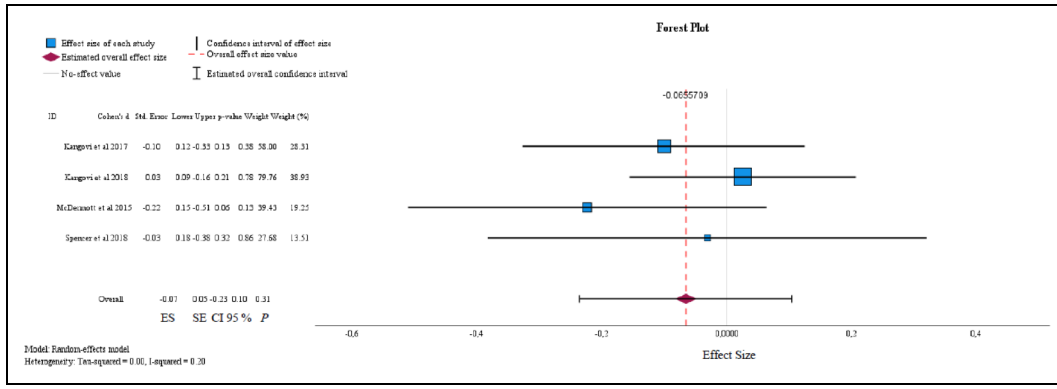


Figure 2. Meta-analysis of social prescribing intervention on haemoglobin A1C (HbA1c) levels in diabetic patients.

frequently (>3 visits).[47] Mercer et al[47] (high Risk of Bias) found significant improvements in quality of life with three or more face-to-face engagements with the community link-worker intervention as measured by the EQ-5D-5L questionnaire 0.071 (95%CI, 0.016, 0.126); $P < 0.011$). Male and female participants with similar cancer presentations responded differently after an enhanced community link-worker led intervention.[46] Female colo-rectal cancer survivors in remission derived up to 15 months health related quality of life improvements when measured by the Functional Assessment of Cancer Therapy – General Scale (FACT – G Scale): 0.171; (95% CI, 0.025–0.317; $P = 0.021$) compared to males who had only short term improvement in health-related quality of life (3 months): 10.074 (95%CI, 2.030–18.119; $P = 0.014$).

Effect of social prescribing intervention on physical activity

Seven studies used physical activity[45,47,48,50,51,53,54] as a primary ($n = 4$)[45,47,48,54] or secondary outcome ($n = 3$).[50,51,53] Two high Risk of Bias studies[45,54] reported significant increments in the frequency[54] of physical activity (3 times per week) from baseline $n = 21$(28%) to 6-month follow-up $n = 47$(63%) $P < 0.05$) and the duration of physical activity[45] (mins/week) by 141 min (95% CI 46.4, 236.4) ($p < 0.004$) in the community link-worker intervention group (baseline: 12 months: 271.3(mins) (421.6) to 344.2 (mins) (455.6) (+72.8) compared to controls (baseline: 12months; 240.1 (mins) (364.1) to 199.9 (mins) (350.0) (−40.2)) who regressed during the 12-month intervention. The remaining three low-Risk-of-Bias studies[48,50,51] and two high-Risk-of-Bias studies[47,53] reported significant within-group improvements only in physical activity levels. There is some evidence from a subgroup analyses conducted in one high Risk of Bias study[47] that participants attending the 'Glasgow Deep End' community link-worker intervention more frequently (>3 in person visits) showed small but significant within-group improvements only in self-reported exercise levels over time 0.339 (95%CI, 0.071−0.607); $P < 0.013$).

Effect of the social prescribing intervention on psychological wellbeing outcomes

Three studies[47,48,55] two high Risk of Bias[47,55] and one low Risk of Bias[48] used indicators of psychological wellbeing as either primary[55] (emotional support, social isolation, anxiety measured by the PROMIS score) or secondary outcomes[47,48] (Short Form 12-Mental[56] and Hospital Anxiety Depression Scale (HADS-Anxiety / HADS-Depression)[57])). Two studies[48,55] did not demonstrate any significant between-group improvements in psychological wellbeing for participants of a community link-worker intervention. However, participants from Mercer

et al[47] study that met face-to-face with the community link-worker more than three times did show significant between-group improvement in their HADS-Anxiety score (−1.380)(95%CI, −2.339, −0.421); $P < 0.005$) and HADS – Depression score (−1.280)(95%CI, −2.209, −0.352; $P < 0.007$) but overall, did not demonstrate any significant effects on this outcome at the end of the trial.

Effect of the social-prescribing intervention on disease-specific measures

HbA1c test measures the percentage of haemoglobin proteins in the blood that are saturated with glucose (normal: <42 mmol/mol (6%)). The HbA1c test is a direct indicator of long-term glycaemic control that correlates well with complications arising from diabetes.[58] Seven studies[48–54] explored the effect of a community link-worker intervention on HbA1c blood levels in patients with diabetes as a primary outcome ($n = 6$)[49–54] or as a secondary outcome ($n = 1$).[48] Four studies[49,50,52,53] reported significant between-group improvements in HbA1c levels at 6 months;[49,53] 12 months[49,50] and 18 months[49,52].

Due to the heterogeneity of the intervention and outcome reporting, it was only possible to conduct a meta-analysis on the pooled data from four studies ($n = 1329$), 2 low Risk of Bias[48,51] and 2 high Risk of Bias[49,52] to compare the effects of community link worker interventions on individuals' HbA1c levels from baseline to 18 months. The respective calculated effect sizes are displayed in Figure 2. The forest plot (red dashed line) indicates a small non-significant effect of −0.07 (95% CI −0.23, 0.10): $P = 0.31$. The Tau-square test represented the variance of the effect size across the studies, the value of 0 means that there is no significant between-study variance beyond what would be expected by chance alone.

Four studies,[44,49,53,54] three of which were from the same author[44,49,53] and all having high Risk of Bias[44,49,53,54] used eight separate diabetes-specific patient-reported outcome measures to determine the effectiveness of a community link-worker intervention on diabetes-related distress, depression, self-management and self-efficacy required to control diabetes. Spencer et al[44,49,53] examined the levels of distress experienced by people with diabetes using the Problem Areas in Diabetes Scale in two early studies[44,53] and later the Diabetes Distress Scale.[49] The first of these studies[53] did not find any significant change between the community link-worker group and the control. However, in the later 12-month study,[44] after adjusting for demographic variables the authors reported significant changes in the intervention group ($n = 72$) at baseline 23.8 (95% CI, 18.7, 29.0) and six months −6.5 (95% CI, −11.2, −0.04); $P < 0.05$) and 6–12 months −7.8 (95% CI, −12.5, −1.4); $P < 0.05$) compared to the delayed intervention group ($n = 92$) at baseline 25.9 (95%CI, 21.2, 30.6) and six months (−1.7 (95% CI, −7.0, 5.3); $P > 0.05$) and 6–12 months −6.2 (95%CI, −11.0, 0.2); $P > 0.05$). These findings are again supported in another later study[49] using the Diabetes Distress Scale which demonstrated significant reduction in diabetes-related distress of −0.4 (95%CI, −0.7, −0.1); $P < 0.05$) for up to 18-months in the community link-worker group only. Spencer et al[44,49] also examined the effectiveness of a community link-worker intervention on diabetes-related depression using the Patient Health Questionairre-9.[59] In the latter of these two studies individuals randomised to the extended peer-led community link-worker intervention (6–18 months) demonstrated significant decrements in depressive episodes at 18 months −2.2 points (95% CI −4.1, −0.3) $P < 0.05$) compared to the enhanced usual care group. The effectiveness of Community link-worker interventions on diabetes self-management was measured in three studies[49,53,54] by the Diabetic Care Profile,[60] Summary of Diabetes Self-Care Activities Measure[61] and the Diabetes Knowledge Scale.[62] The Diabetic Care Profile[60] used by Spencer et al[49] which assesses a patients' understanding of the social and psychological factors related to the self-management of diabetes reported the extended peer-led community link-worker group demonstrated a significant between-group improvement of 0.3 points (95% CI, 0.1, 0.6); $P < 0.05$) after 12 months against the enhanced usual care group but not the community link- worker only group. The Diabetes Knowledge Scale was used in one study only[54]. Significant between-group results were reported at the 6-month follow-up for community link-worker intervention

versus case management versus standard care ($P < 0.05$). Spencer et al[49,53] were the only studies to examine the effectiveness of community link-worker interventions on diabetes-related self-efficacy utilising the Perceived Competence of Diabetes Scale[63] and Diabetes Social Support,[64] respectively. At 6 months' time point diabetes self-efficacy was significantly improved 0.5 (95%CI, 0.2,0.8); $P < 0.01$) in the community link-worker group only[49].

Five studies[48,50,51,53,54] investigating the effect of a community link-worker intervention on body mass index,[50,51,54] cholesterol[48,50,53] and blood pressure[48,50] did not report any significant within group or between group changes across the trial periods.

Discussion

The aim of this systematic review was to determine the effectiveness of social prescribing in the management of long-term conditions in community-based adults. To the best of our knowledge, this is the first systematic review to conduct a meta-analysis of the data on the effectiveness of social prescribing focusing on outcomes that reflect the multifactorial nature of long-term conditions. Twelve randomised controlled trials across different geographical locations, in areas of socio-economic deprivation, were included in this review. Most studies included in this review utilised a tailored social prescribing model directed at improving diabetes self-management. This review found some evidence to support the effectiveness of social prescribing in improving quality of life and disease-specific outcome measures. There is some evidence that adherence to a social prescribing intervention may result in positive outcomes for the participant. Most significant improvements were in reducing diabetes-related distress; diabetes-related depressive episodes and improving diabetes self-management efficacy. Given the heterogeneity of the included studies and outcome measures and like previous review conclusions[19,36,37] it is not possible to determine the effectiveness of social prescribing in the management of long-term conditions in community-based adults.

The results of this review suggest that an enhanced social prescribing intervention with increased uptake of support services provided over a longer duration will lead to improvements in both short and long-term quality of life outcomes.[47,65] As females reported longer-term improvements (15 months) there may be other factors influencing the gender response to the social prescribing intervention. This contrasts with previous evidence that found men with poor health, anxiety, and social networks had greater benefit from social prescribing interventions than women[66] and may be explained by the possible gender differences in coping strategies of cancer patients.[67] It is unclear if there is a gender response to social prescribing which is a possible area for future research.

There is some evidence from this review that participating in a social prescribing intervention can significantly influence a participant's uptake of physical activity in the short term[54] and also the weekly duration of physical activity in the long-term[45] helping participants with controlled diabetes meet recommended physical activity guidelines[68] with minimal support.[45] Other studies within this review[48,50,51,53] also demonstrated significant improvements in physical activity but within group only. The control groups also receiving physical activity advice and access to free services e.g., dance classes, exercise classes and walking groups may explain these improvements. No study in the present review utilised external activity monitors e.g., pedometers that would provide objective measures of activity and eliminate response bias. Social prescribing interventions did not demonstrate any significant between-group changes in psychological well-being in participants experiencing anxiety and depression[44,47] or in patients with limited social network.[55] High dropout rates and lack of reporting on intervention adherence makes it difficult to interpret these results with confidence.

The results from individual studies[44,45,49–54] within this review suggest that targeted disease-specific community link-worker interventions can significantly improve HbA1c levels in patients with diabetes in the short (six months) and long-term (18 months) to those recommended by the American diabetes guidelines.[69] However, when the data from suitable studies[48,49,51,52] were pooled in a meta-analysis the results showed social prescribing interventions had only a small non-significant impact on HbA1c levels at six months ($P = 0.31$). This finding is contrasted in a recent large-scale study[70] which found a small statistically significant reduction in HbA1c (−1.11 mmol/

mol) (95% CI: −1.878, −0.342); $P < 0.05$), however, the authors concluded this was not sufficient to be clinically significant, thus echoing our results. Psychological co-morbidities are common in people with physical long-term conditions[71,72] and may influence the lifelong trajectory of their illness.[73,74] This review has highlighted some evidence to support the role of social prescribing in significantly improving disease-related distress,[49] depression,[44] self-management knowledge[54] and self-efficacy[53] which play an integral role in patient empowerment.[75,76] The heterogeneity and unblinding of outcome measures ($n = 41$) used to measure the effect of the intervention on quality of life, physical activity, psychological wellbeing and disease-specific parameters lessens the credibility of their findings and made evidence synthesis challenging. Outcome reporting bias and inconsistency in the measurement of outcomes could be minimised through the development[77,78] and reporting[79] of standardised core outcome sets with established Minimal Clinical Important Difference values similar to other areas.[80] This review has identified key factors that may influence future clinical practice; targeted and enhanced social prescribing interventions improve self-management and self-efficacy of long-term conditions; the use of technology in the measurement of physical activity should support self-reported measures of physical activity in social prescribing interventions.

It should be noted that there are some limitations with this review. Firstly, only studies published in the English language were considered for inclusion, it is possible some studies published in another language were missed. Secondly, while the search strategy was comprehensive, including nine databases, three trial registries and the grey literature, it could be argued that the range of keywords used could have been more extensive. It is possible that using specific conditions and outcome measures may have resulted in a more focused search and perhaps additional papers. Notwithstanding this, we are confident we have identified all relevant papers.

This comprehensive systematic review only includes quasi-randomised and randomised controlled trials whose study design matches the current definition of social prescribing[23] and is the first review of social prescribing to use a meta-analysis to analyse the data. The studies included within our review were heterogeneous in terms of patient populations, interventions delivered, and outcome measures used, which substantially influences the ability to make meaningful comparisons. This review suggests that social prescribing interventions designed to target specific long-term conditions, i.e., cancer and diabetes, demonstrated significant improvements in quality of life and disease-specific psychological outcomes respectively. There was some evidence for improvement in physical activity levels, but most findings were within-group changes only. Social prescribing interventions did not demonstrate any significant changes in psychological well-being. The findings from this review suggest it is not possible to determine the effectiveness of social prescribing in the management of long-term conditions.

Clinical messages

- Tailored social prescribing interventions improved quality of life in cancer remission patients.
- Social prescribing interventions improved diabetes-specific psychological outcomes.
- Social prescribing interventions may improve the frequency and duration of physical activity in people with diabetes.

Author contributions

Concept/idea/research design were done by D.J OS., J.M H., L.M B., and J.G McV. Writing Review and Editing were done by D.J OS., J.M H., L.M B., J.G McV., and J.R C. Data collection was done by D.J OS. and J.G McV. Data analysis was done by D.J OS., J.G McV. and J.R C. Project management was done by D.J OS. and J.G McV. Providing institutional liaisons was done by J.G McV. Consultation (including review of manuscript before submitting) was done by J.M H, L.M B., J.G McV. and J.R C.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Systematic review registration

The protocol was registered with the Open Science Framework https://osf.io/p5vf9/

Supplemental materials

Please find the following supplemental material visualised and available to download via Figshare in the hyperlink below. Where there are more than one item, you can scroll through each tab to see each separate item 10.6084/m9.figshare.24099798

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