

The impact of social prescribing on wellbeing, health, healthcare utilisation and costs for people with type 2 diabetes: multimethod SPRING_NE study (Social Prescribing in the North East study)

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Scientific summary

Background

Link worker social prescribing enables healthcare professionals to address patients' non-medical needs by linking patients into various services and is key to the personalisation agenda in the 2019 NHS Long Term Plan. Evidence for its effectiveness and how it is experienced is lacking.

Aims

To evaluate the impact and costs of a community-based link worker social prescribing intervention on the health and health care utilisation of adults aged 40-74 with type 2 diabetes mellitus (T2DM), to observe how link workers deliver the intervention, how patients engage with social prescribing and to capture the experiences of participants with LTCs in receipt of social prescribing during and immediately after the first COVID-19 pandemic lockdown.

Objectives

- To measure the impact of the social prescribing intervention for adults with T2DM on glycated haemoglobin (HbA1c, primary outcome), body mass index (BMI), blood pressure (BP), cholesterol, smoking and health-care utilisation.
- To examine differential intervention effects in sub-groups by gender, age, ethnicity, multi-morbidity, BMI and deprivation level.
- To measure self-reported health-related quality of life (HRQoL) as change in EQ-5D-5L at 12-month follow-up.
- To establish the cost-effectiveness of the social prescribing intervention for healthcare utilisation and outcomes.
- To examine the delivery of social prescribing by exploring link workers' daily practices.
- To examine patients' engagement with the social prescribing intervention.
- To examine the role of social prescribing during the early stages of UK lockdown.

Methods

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Study design

Multimethods evaluation comprising three work packages (WPs).

Study population

The study population comprised community-dwelling patients aged 40 to 74 years with T2DM in general practices where the intervention was offered between April 2015 and March 2019. A sub-study of HRQoL comprised individuals (irrespective of diagnosis) who completed a baseline assessment between June 2018 and July 2019.

Intervention

The intervention was a community-based link worker social prescribing intervention for people aged 40-74 who had at least one of eight LTCs (diabetes type 1 and 2, chronic obstructive pulmonary disease, asthma, coronary heart disease, heart failure, epilepsy, and osteoporosis, with or without anxiety and/or depression). Partially funded by a Social Impact Bond (SIB) and delivered by two not-for-profit providers, the intervention aimed to improve health-related outcomes and quality of life of people with LTCs. Referral was from 16 general practices. Initial (pre-COVID-19) contact comprised clients meeting a link worker to complete the Well-being Star™, a proprietary tool to help clients assess their state across eight parameters. Following this, the link worker and client co-produced a personalised action plan to address problems. Link workers supported clients to access a range of local services (e.g. physical activity classes, welfare rights) or to develop self-directed goals. Subsequent contact was either face-to-face, or via telephone, text, email or video-call. Clients could be engaged with the intervention for approximately three and a half years.

Work Package 1 Health outcomes and healthcare utilisation

Longitudinal analysis of Secondary Uses Service data and Quality Outcomes Framework (QOF) data. A range of estimated treatment effect values were derived for the following control conditions: i) study-eligible patients in intervention practices (n=16) in receipt of the intervention compared to study-eligible patients who received the intervention after a time interval; (ii) study-eligible patients in intervention practices in receipt of the intervention compared to those who did not receive the intervention; (iii) study eligible patients in intervention practices receiving the intervention compared with study eligible patients in non-

intervention practices (n=11); (iv) intention-to-treat (ITT) study eligible patients in intervention practices compared with study-eligible patients not in intervention practices.

Yearly data from April 01 2012 (four years pre-intervention) until March 31 2019 (four years post-intervention) were used with 8357 observations for the primary outcome.

Difference-in-differences two-way (individual and time) fixed effects models were compared for primary (HbA1c) and secondary (BMI, BP, cholesterol and smoking outcomes). To reflect the data distribution (considering density at zero and a long right-hand tail), a two-part model was used to estimate healthcare use and costs. Sub-group analysis was undertaken based on pre-treatment characteristics, by sex, age group (over or under aged 55), ethnic group (white or non-white), presence of obesity (BMI greater than or equal to 30), presence of co-morbidity (none, one, two or more) and area-level socioeconomic deprivation deciles. Statistical analyses were conducted using Stata software version 16.0.

Health-related quality of life (HRQoL)

Within-cohort comparison of EQ-5D-5L for all referred individuals who attended an initial meeting with a link worker between July 2018 and June 2019, with 12-month follow-up (July 2019-June 2020). Descriptive statistics were computed on demographic variables (pre-COVID and post-COVID groups), EQ-5D-5L dimensions, EQ-5D health state summary value and EQ-Visual Analogue Scale (VAS). Linear regression analyses explored whether participant characteristics could explain difference in EQ-5D values scores from baseline to follow-up; regression discontinuity design (RDD) was used to investigate the impact of COVID-19 on EQ-5D-5L and EQ-VAS.

Work package 2 Economic evaluation

Cost effectiveness analysis was undertaken from the perspective of the healthcare provider. Exploratory analysis was conducted using the UK Prospective Diabetes Study Outcomes Model 2© (UKPDS-OM2). The modelled population was sampled based on a combination of baseline data available from WP1 and from the literature. Outcome measures were incremental cost-effectiveness ratios demonstrating the ratio of differences in the costs between the intervention and comparator and the difference in benefits. Sensitivity analysis was used to ascertain robustness of the different estimates derived.

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Work package 3 Qualitative study

Qualitative research comprising (i) Link worker ethnography over a ten month period; (ii) client ethnography over 20 months with 19 purposively sampled individuals. Methods included participant observation, focus groups, shadowing, semi-structured interviews, photo-elicitation interviews and data collected by link workers during client contact were also obtained. During the initial lockdown period, semi-structured interviews were undertaken with 29 participants in the HRQoL study to explore the impact of COVID on their lives and the role of social prescribing. Thematic content analysis was achieved by line-by-line coding of all textual and visual data.

Results

Health Outcomes and healthcare costs

Consistently, the intervention was found to impact on glycated haemoglobin (HbA1c) and blood pressure. The size of the impact varied depending on treatment and control groups. ITT analysis estimated the overall impact on HbA1c was small and non-clinically significant, but statistically significant (-1.11mmol/mol); when accounting for the time varying nature on the treated, statistically significant reductions in HbA1c of -4.57 mmol/mol were observed. These represent reductions of between two and eight percent compared to the control group. Similar trends were observed for blood pressure with a fall of 1.5 percentage points (not statistically significant) in the ITT analysis rising to a seven point reduction for individuals three years post-treatment compared to the controls. For cholesterol, BMI and smoking, there was little evidence of an effect.

Sub-group analysis showed that improvements in HbA1c were higher amongst those living in areas of higher socioeconomic deprivation. Improvements in BP were greater for the ethnically non-white and, marginally, for people living in areas of greater socioeconomic deprivation.

Healthcare cost estimates ranged from +£18.22 (individuals with one extra co-morbidity) to -£50.35 (for individuals with no extra co-morbidity), the latter being approximately 16 per cent of the pre-treatment mean in-patient non-elective costs. For the treatment group, there was a shift from unplanned care (non-elective and A&E admissions) to planned care

(elective and outpatient care). Although not statistically significant, these may be economically significant changes.

Health-related quality of life (HRQoL)

No statistically significant differences were found between baseline and 12-month follow-up EQ-5D-5L for pre-COVID and post-COVID groups.

Economic analysis

The intervention was found to be, on average, more costly and more effective than current practice. The reduction in costs associated with clinical complications and improved health-related quality-of-life were minor. Mean cost for the intervention itself was £1,345 per participant, the incremental mean health gain was 0.004 quality-adjusted-life-years (95% CI – -0.022,0.029) and incremental cost-effectiveness ratio was £327,250 per quality-adjusted-life-years gained. These findings are based on the assumption that the intervention has a four-year duration of effect.

Link worker and client experiences of social prescribing

Link work was shaped and constrained by the requirement to meet targets and generate payments. The day-to-day delivery of social prescribing spanned a spectrum ranging from support work and supported linking though to focusing on motivating behaviour change, reflecting variation in both provider and individual link worker practices. The degree of link worker face-face work with clients was generally less than desired by link workers due to the pressures to ensure referrals and completion of the outcome metrics. Directly addressing the social determinants of health within this set of practices was often difficult.

The value of an effective and supported signposting and referral system in which link workers regularly liaise with the onward activity and the client was clearly demonstrated as was the wide-ranging and positive impacts of provider support groups. Multi-morbidity and complex social issues, coupled with reduced economic, social and health capital were key factors influencing the level of support required and there was huge variation in the circumstances of those referred into the intervention. However, the type and amount of support provided differed considerably, not always mirroring need and an interventional 'drift' was observed over time from supported to unsupported linking, more akin to signposting.

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Complex health and social problems could result in setbacks that required ongoing and sometimes intensive support to address. Some clients responded to the intervention as anticipated and a relatively straightforward linear trajectory to better health was observed, primarily amongst those in stable contexts with access to a range of resources. A linear pathway to better health was not always possible for those experiencing uncertain contexts due to a combination of factors including, poverty, unemployment, discrimination, multi-morbidity and poor mental health. The need to intensively address the social determinants of health was most apparent when more intensive support was required, but such support was often limited due to the performative pressures driving link work and the focus on behavioural change.

The COVID-19 pandemic had a profound effect on the lives of some study participants and caused the intervention to switch to remote provision. The focus at the start of the first UK lockdown was on supporting people to cope and ensuring that medicines and food were supplied. Those with complex health problems who were shielding and living in socio-economically deprived circumstances experienced the greatest difficulties, as many lacked the social, economic or environmental capital needed to make life bearable during the lockdown. Support from a link worker was very important to some during the lockdown, although contact with link workers was variable.

Discussion

Interpretation of findings and relationship to prior knowledge

This is the first large-scale multimethods study to combine quasi-experimental methods, economic evaluation, qualitative and ethnographic research to evaluate the impact of a social prescribing intervention on people with T2DM. The effectiveness analysis suggests that the intervention has a small, non-clinically significant, but statistically significant impact on glycated haemoglobin, a small effect on blood pressure, accompanied by a (non-statistically significant) shift from unplanned care to planned care that may be economically significant. The intervention was effective, but not cost-effective. Detailed qualitative data highlighted the multiple pressures on link workers in generating referrals and meeting targets and how this conflicted with delivering a personalised intervention. When client need and the type and amount of support offered was aligned, the value of the intervention was clearly visible. However, setbacks were common and intensive support to overcome particularly

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challenging circumstances or setbacks was not always provided. Holistic social prescribing, fully embedded within primary care, that provides supported linking to navigate social determinants of health and which acknowledges the non-linearity of health improvement is challenging to deliver, but offers opportunities for improvements in health and wellbeing.

Strengths and limitations of the methods

The study was rigorously, ethically and legally conducted to internationally acceptable standards, adhered to accepted reporting protocols and was overseen by an independent Study Steering Committee. The strengths of the study lie in the use of multimethods comprising robust quantitative and qualitative methods that allow the intervention to be examined from different perspectives, as well as in the particular strengths of our quantitative and ethnographic approaches.

The quasi-experimental design included large numbers of observations with sufficient power to detect effects and the ITT approach overcomes a number of problems associated with observational data.

The application of a well-established T2DM simulation model to provide a cost per QALY gained is a key strength.

The use of participant observation, complemented by interviews and focus groups, over an extended period of time enabled the intervention to be viewed from the perspectives of both link workers and clients rather than relying on self-report. The amount of data generated afforded a considerable degree of triangulation and assurance about reliability of our interpretation.

Key limitations were (i) reduced sample size due to non-participation of seven general practices; (ii) incompleteness and unreliability of some of the QOF data; (iii) unavailability of accurate data on intervention intensity and patient co-morbidity; (iv) reliance on an exploratory analysis with significant sensitivity analysis; (v) limited perspectives from VCSE.

Implications for the delivery of social prescribing

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The intervention evaluated in this study is a particular model of social prescribing, funded via a social impact bond (SIB) and operating with specific targets. Nevertheless, the findings have wider implications for the rapidly developing social prescribing policy and practice landscape across the UK: (i) embedding social prescribing within primary care requires careful planning and health care professional ‘buy in’ cannot be assumed; (ii) social prescribing needs to be well-integrated with local community infrastructure, and for this to be successful, well-funded public and voluntary sector services are essential; (iii) sufficient capacity to provide supported linking requires careful consideration of link worker caseload; (iv) identifying measurable and relevant outcome measures reflecting the breadth and scope of social prescribing is unattainable, although there may be scope in using robust measures to examine health care usage; (v) claims that social prescribing can reduce health inequalities are premature, but social prescribing can mitigate upstream pressures.

Recommendations for further research

1. Qualitative research to explore primary care engagement with social prescribing to explore how NHS social prescribing is being operationalised and embedded within primary care networks.
2. Research into the integration of NHS social prescribing with voluntary and community sectors, particularly onward referral mechanisms, capacity and costs.
3. Further evaluation of the impact of social prescribing on health care usage and costs, including medication.
4. Research on wider effects of social prescribing.
5. Further research exploring the capacity required for social prescribing to address social determinants of health.

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