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Can Treatment of Social Isolation and Loneliness Reduce Healthcare Utility? An analysis of Social Prescribing

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Can Treatment of Social Isolation and Loneliness Reduce Healthcare

Utility? An analysis of Social Prescribing

CAPSTONE PROJECT PAPER

A paper submitted in partial fulfillment of the Requirements for the degree of Master
of Public Health in the University of Kentucky College of Public Health

By

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Abstract

The paper focuses on the practice of social prescribing as it is currently implemented through the National Health Service (NHS) of the United Kingdom. Social Prescribing is an emerging healthcare intervention aimed at referring patients to community-based activities. NHS promotes social prescribing as a method of reducing healthcare utilization in chronically ill patients. Current evidence on social prescribing is subject to significant variation and has not supported NHS's claims. The potential link between feeling of social isolation, loneliness and chronic illness was further investigated through data from the National Social Life, Health & Aging Project (NSHAP). Data was tested for correlations between respondents' self-report of heart problems (chi-squared) and systolic blood pressure (Pearson's correlation), in relation to survey measures on subjects' level of social isolation and loneliness. To control for common comorbidities of cardiovascular disease, respondents were excluded if they reported current smoking status, diagnosis of diabetes, or waist measurements relating to obesity. Logistic and linear regression was then performed to identify predictive models for self-reported heart problems and systolic blood pressure respectively. The study provides limited evidence for to support the impact of social prescribing. This limitation is driven by the high degree of variation amongst reported outcomes. Future policy initiatives should focus on developing the body of literature and establishing clear expectations for patient prognosis.

Keywords:

Long Term Health Condition- Ongoing illnesses which cannot be cured, but can be effectively managed through healthy patient habits and medical intervention.

Loneliness- The subjective feeling of disconnection from those around you.

Social Isolation- The persistent absence of social contact.

Social Prescribing- The process of referring a patient to community-based activities.

List of abbreviations

CVD- Cardiovascular Disease

EHR- Electronic Health Record

GP- General Practice/Practitioner

NHS- National Health Service

NORC- Non-partisan and Objective Research Organization

NSHAP- National Social Life, Health & Aging Practice

OHCA- Out of Hospital Cardiac Arrest

USCB- United States Census Bureau

USD-United States Dollar

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Introduction

Social prescribing is an emerging healthcare practice targeting individuals experiencing social isolation and loneliness (NHS, n.d). Through social prescribing programs, healthcare professionals can refer patients to a variety of community activities. In the United Kingdom, the National Health Service (NHS) has begun developing infrastructure within general practices to facilitate social prescribing. The NHS suggests that social prescribing can benefit individuals experiencing an array of long-term health conditions (NHS, nd). However, the specific conditions that can be addressed remain unclear. There is also confusion regarding the directionality of potential interactions between social isolation, loneliness, and chronic health outcomes. Do these negative social experiences negatively impact one's health, or does poor health promote negative social experiences? There is value in understanding these dynamics when analyzing social prescribing's reported ability to decrease healthcare utilization (Sheffield, 2014).

The NHS's claims on the efficacy of social prescribing warrant further investigation. Genuine questions remain regarding who can benefit from the service. This paper will attempt to analyze this issue through two methods. The first is a comprehensive review of current literature and practice of social prescribing. The second is a statistical analysis of the relationships between social isolation, loneliness and outcomes associated with the long-term health condition, cardiovascular disease (CVD). Through this analysis the paper aims to determine whether CVD patients are at higher risk for experiencing social isolation and loneliness. Through assessing these items, the paper will attempt to describe the current understanding of social prescribing as an intervention for long term health conditions.

Social Prescribing Background

Social prescribing is an emerging practice targeting lonely and socially isolated individuals. Through social prescribing, healthcare providers refer clients to community-based activities. (Ewbank, 2020) The aim of social prescribing is to address patient care holistically. This means viewing a patient's health in the context of their specific needs and abilities. (Ewbank, 2020) Social prescribing patients attend community-based programs focusing on topics such as: volunteering, performing arts, group learning, cooking, and physical activity. The nature of the activities one attends is based heavily on the patients stated goals, abilities, and motivation.

While social prescribing programs have existed in the United Kingdom since the 1980s, the last decade has seen the NHS formally integrate these programs into General Practice (GP) systems (Ewbank, 2020). NHS's *Five Year Forward Review*, (NHS, 2014) laid out a roadmap for developing new models of care. The report emphasized the need for new, patient-centered programs. The NHS hoped to utilize this novel treatment intervention to reduce overall burden on the healthcare system. (NHS, 2014) The NHS review highlighted a social prescribing pilot program in Rotherham. The program was noted for its ability to reduce out-patient appointments and hospital admissions.

In 2019, the NHS under the Universal Personalized Care program, began incorporating social prescribing in its general practice system (NHS, nd.). The link worker is a non-clinical role, focused on connecting clients with appropriate social prescribing programs. Link workers typically receive clients through referral from a GP and meet with individuals over a 3-month period consisting of approximately 6 individual sessions. (NHS, nd.) During these meetings the

link worker helps the individual identify appropriate community programs based on their stated treatment goals. The NHS aims to recruit 1,000 link workers by 2021, with the goal of serving up to 900,000 patients by 2024. (NHS. Nd.)

Social prescribing programs can receive funding through a variety of sources. This can include funding through Clinical Commissioning groups, local governments, and grants (Polley et al., n.d.). There are no clear guidelines for how this funding should be deployed. Individual social prescribing schemes can make decisions on allocating funding based on the needs of their community. The current NHS contract secures five years of funding for primary care networks serving at least 30,000 patients to employ a full-time link worker (Ewbank, 2020). It is difficult to obtain clear estimates for the offsetting of cost through reduced healthcare utilization.

Additionally, £5 million (\$6.95 million USD) of funding has been allocated to establish a National Academy of Social Prescribing. The academy is tasked with developing standardized models of social prescribing, best practice standards and accreditation guidelines (Department of Health and Social Care, 2019).

Social prescribing in practice

The Rotherham pilot program was commissioned by NHS Rotherham in 2012. The pilot received £1.1 million (\$1.53 million USD) in grant funding through the NHS covering a period of two years. Approximately 56% of the program were allocated for developing a roster of Voluntary and Community Sector (VCS) activities. The remaining 44% was used for program cost related to developing and running the pilot. The pilot offered a total of 31 services provided by 24 unique organizations. A total of 30 GP sites participated in the pilot. The pilot cohort consisted of 1,607 patients, 87% of the pilot cohort were age 60 or older. Females comprised 61% of the pilot cohort (39% Male), while whites accounted for 91% of the cohort.

The most popular programs focused on information and advice (n=248), community activity (n=246), physical activity (n=172), and befriending (n=167). 1,118 patients were referred to a funded VCS and the remainder were referred to non-funded services.

After six months patients saw a 14% overall reduction in inpatient admissions. For patients who participated in the program for one year, overall inpatient admissions were reduced by 21%. 27% of patients referred to a funded VCS for six months saw a reduction in inpatient services. This reduction in inpatient admissions was seen in 48% of patients referred to a funded VCS for one year. For the six-month group 30% of patients referred to a funded VCS saw a reduction in outpatient appointments. In the one-year group, 55% of patients referred to a funded VCS experienced a reduction in outpatient appointments.

One shortcoming of the Rotherham pilot is the lack of reporting on patient diagnoses, and corresponding services utilized. The results were based on the entire cohort which received differing services for a multitude of reasons. One could argue that this heterogeneity supports the notion that social prescribing is responsible for the observed outcomes. However, there is also evidence that this heterogeneity could skew observed results as well. Another social prescribing program in South Devon (N=151) found that mean healthcare cost rose by 66.7%, despite overall measures of quality of life saw improvement. This result was attributed to 12 medically frail individuals who saw marked declines in health over the study period. This outcome highlight the fact that in heterogeneous samples, there may be underlying trends which influence the final results. The identification of such trends can help researchers understand when social prescribing is beneficial, and when it isn't. Following up on the South Devon data, one may ask whether the social prescribing program influenced the subject worsening health. Perhaps the social prescribing activity the individual attended was beyond their physical abilities.

Healthcare Utilization

While the Rotherham pilot program reported significant decreases in healthcare utilization, the broader body of evidence is less clear. Previous research has reported reductions ranging from 2% to 70% in care utilization (Polley et al., 2017). As described above, these results could be attributed to the wide variance in both patients referred and services offered. Furthermore, studies following individual cohorts from a single GP or social prescribing program are likely to have a low number of subjects. Even within these small cohorts, subjects are likely to be referred to a variety of activities for varying conditions (Mason et al., 2019). This limits our ability to draw meaningful conclusions from their data (Loftus et al., 2017). However, in one study was found (Polley et al., 2019) in which subjects were organized with a case-matched control groups based on diagnosis of cardiovascular disease, age and gender (N=105). Results of the study showed that GP visits were reduced by 40% for the social prescribing group.

What is Successful Social Prescribing?

The variability in program design and reported outcomes, leaves doubt regarding what “successful” social prescribing is. The NHS has designed its social prescribing initiatives around the guiding principle that patients should be active participants in the planning and delivery of their care. Central to this principle is an acknowledgement of the patient’s values and goals. Currently, the best practice for “successful” outcomes may be to focus on the patient-centered nature of the treatment. Evidence suggests that patients are more likely to participate in a social prescribing program when they enter with positive attitudes and expectations (Husk et al., 2019). Attitudes promoting participation include dissatisfaction with one’s current treatment

interventions and the belief that social prescribing could positively affect their condition. It could be that patients that enter treatment with positive expectations may be more aware of positive changes they experience.

Barriers

Given the novelty of social prescribing schemes, some GPs may lack the understanding or resources to begin referring patients. For example, GPs may be unfamiliar with their communities' resources. The role of the link worker is intended fill this gap in information, but some GPs may not feel confident with the link worker's level of training or expertise. Additionally, the lack of evidence-based standards may make conversations about treatment course and benefits difficult for GPs (Fixsen, et al., 2020). As a result, GPs may avoid discussing social prescribing in favor of more familiar medical interventions. The local contexts of social prescribing programs have hindered the development of standardized models of evaluation. (Husk et al., 2019) Social prescribing referrals are inherently limited to what is available in the community. As a result, patients can receive significantly different services at varied intervals.

Social Isolation vs. Loneliness

While social isolation and loneliness are at times used interchangeably, the two have meaningful differences. Social Isolation refers to the objective absence of human contact (Veazie et al., 2019). Alternatively, loneliness is the subjective feeling of alienation from those around them. Effectively, loneliness is the perception that one is socially isolated. (Donovan & Blazer, 2020) While both experiences can, and often do, occur simultaneously, they are not synonymous. One can interact with multiple people each day, but feel they have no one to “open

up to.” Conversely, an individual may spend long periods of time at home alone but are still satisfied with the time they do get to spend with friends and family.

From the perspective of healthcare, it is worthwhile to distinguish between the above experiences. Both experiences have the potential to negatively influence one’s health in unique ways. The lonely individual may be at higher risk for increased stress and worse mental health. The socially isolated individual may fail to get adequate physical activity. They could also struggle to meet their basic needs, when doing so requires travel outside the home. Each individual has unique needs that may be amenable to treatment.

Social isolation, Loneliness, and Health

Valtorta et al. (2018) examined Cardiovascular Disease (CVD) in the context of both social isolation and loneliness. The 6-year longitudinal study found that while social isolation was not associated with increased risk of CVD, self-reported loneliness was. This was true of any individual who reported loneliness over the 6-year period. The frequency of reported loneliness was not found to have a cumulative effect on CVD risk.

There is evidence linking social isolation and loneliness to mortality (Holt-Lunstad et al., 2015). The nature of their interaction is unclear. There is some evidence that individuals who are both socially isolated and lonely have a significantly higher risk of mortality, compared to individuals who endorse only one experience (Beller et al., 2018). Conversely, other literature supports that social isolation has the greatest risk of all-cause mortality (Steptoe et al., 2013). In the context of CVD, social isolation was not found to correlate with risk of developing CVD, but was found to increase the risk of mortality following a cardiac event (Smith et al., 2021). It is important to note that this trend was only present in individuals who were not admitted to the hospital following the event.

These results suggest that social isolation may not directly impact the development or progression of CVD. Instead, socially isolation may increase risk for complications from CVD due to a lack of access to immediate help. If an individual spends large amounts of time alone, they are less likely to have someone near to administer aid during a cardiac event. Out of Hospital Cardiac Arrest (OHCA) accounts for 70% of all instances of cardiac arrests in the United States. (Heart.org, n.d.) Immediate intervention through bystander Cardiopulmonary Resuscitation is a significant predictor of survival. (Vierek, 2017) Socially isolated individuals are less likely have someone available to administer these services in the event of an acute cardiac event.

Methods

Data Source

The data used in this study originated from the National Social Life, Health & Aging Project (NSHAP) (NSHAP, nd). NSHAP is conducted through the non-partisan and objective research organization (NORC) at the University of Chicago. NSHAP is a multidimensional longitudinal study focused on older adults in the United States. Data from three cohort waves have been collected thus far, Cohort One Wave One (C1W1) 2005-2006, Cohort One Wave Two (C1W2) 2010-2011, and Cohort One Wave Three (C1W3) 2015-2016. This study used data obtained from C1W3 consisting of 4,777 total subjects. Data was collected through in-person interviews, recording of biological measures, and supplement leave behind questionnaires. The R data file, and corresponding code book were downloaded from the NSHAP website <https://www.icpsr.umich.edu/web/NACDA/studies/36873/datadocumentation#>.

Demographics

The mean age for all participants was 67.63. For males the mean age was 67.57. For females the mean age was 67.69. The study consisted of 2,374 female participants and 2,003 male participants. 3,194 participants identified as White, 719 participants identified as Black, and 452 identified as Asian, Pacific Islander, American Indian or Alaskan native. 2,755 participants reported being married (Male=1,461, Female=1,294). 149 unmarried participants reported living with a partner (Male=66, Female=73). For the purpose of the statistical analysis, individuals who reported current smoking status, diagnosis of diabetes, or waist diameter above a certain threshold (males=40in, females=34.5, males & females combined=37.25). After adjusting for these variables the analysis consisted of 256 females, 235 males, and 547 for the combined male and female group.

Variable Selection

Dependent variables were categorized as relating either to social isolation or loneliness. Items that referenced objective measures regarding frequency of interaction with others and daily levels of activity, were categorized as pertaining to Social Isolation. These measures included items such as, marital or relationship status, and frequency of attending organized events (Table 1). In total 7 items were categorized as relating to social isolation. Social isolation items were presented as ratings of the frequency of an activity, ranging from 0 (never) to 6 (several times a week). Exceptions to this format were marital status which ranged from 1 (married) to 6 (never married). Items that referenced the subject's subjective feelings on their relationships were categorized as pertaining to loneliness (Table 2). All loneliness variables were also presented on a Likert scale ranging from 0 (never) to 3 (often).

Two measures relating to participants' cardiovascular health were used as dependent variables. The first was the subject's self-report of having been told by a doctor that they have a

heart problem. This measure did not ask the subject to disclose the exact nature of the heart problem. The definition of “doctor” excluded chiropractors, dentists, nurses, and nurse practitioners. The second variable was the participants systolic blood pressure. Blood pressure was in two separate instances. For this analysis the systolic blood pressure from the second reading was used. To account for comorbidities associated with CVD, three control variables were identified, weight, diabetes diagnosis, and smoking status.

Social Isolation Variables	
Variable	Definition
Marital Status	Current Marital Status
Romantic Partner	Current Relationship Status (if unmarried)
Volunteering	Frequency of volunteering in the past year
Attending groups/events	Frequency of attending organized meetings in the past year
Socializing	Frequency of socializing with friends and/or family in the last year
Attending services	Frequency of attending religious services in the past year

Table 1 The variables categorized as addressing social isolation, and corresponding definitions

Loneliness Variables	
Variable	Definition
Left Out*	How often do you feel left out?
Isolated **	How often do you feel isolated?
Companion*	How often do you feel you lack companionship?
Family openness	How often can you open up to family?
Friends openness	How often can you open up to friends?
Family Understanding	How often does family understand how you feel?
Friends Understanding	How often do friends understand how you feel?
Happiness	Self-rated happiness

Table 2 The variables categorized as addressing loneliness. (*) Variables comprising the UCLA loneliness scale. (†) Refers to the subjects' subjective feelings of isolation, thus was coded as relating to loneliness.

Statistical Analysis

Chi-squared tests were used to analyze the relationship between subjects' self-reported heart problems and the designated social isolation and loneliness variables. Pearson's correlation was used to compare the variable of systolic blood pressure to the social isolation and loneliness variables. Analysis was performed for the entire sample, as well as male and female subgroups. To control for cardiovascular disease comorbidities, smokers, diabetics, and respondents above a certain waist size were removed. Logistic and linear regression were used to identify potential predictive models for variables that reached statistical significance in the previous analysis. Statistically significant variables underwent logistic regression or linear regression for self-reported heart problems and systolic blood pressure respectively. All statistical analysis was performed using R Studio version 1.2.5033 run on MacOS version 10.15.7.

Results

Heart problems and social isolation

The chi-squared analysis for the male and female group revealed significant relationships between physical activity ($X^2(5) = 16.90, p = 4.69e^{-3}$), volunteering ($X^2(6) = 18.33, p = 0.01$), and self-reported heart problems. A logistic regression analysis was performed to assess the relationship between physical activity and self-reported heart problems for both females, and the combined male and female group ($p = 1.38e^{-3}$) with $R^2 = 0.08$. Males and females predicted likelihood of a reported heart problem is equal to -1.18-1.12(<once per month)-16.39(1-3 times

per month)-1.11(1-2 times per week)-1.07(3-4 times per week)-1.36(≥ 5 times per week). A significant linear model for volunteering and self-reported heart problems was not identified.

Chi-squared results Heart Problems and Social Isolation			
Variable	df	χ^2	p-value
Male and female			
Physical Activity	5	16.9	4.69E-03
Volunteering	6	18.33	0.01

Table 3 Measures of social isolation which reached significance after controlling for confounding variables.

Heart problems and loneliness

The chi-squared analysis revealed several significant interactions between self-reported heart problems and measures of loneliness, happiness for males ($X^2(4) = 11.05, p = 0.03$), feelings of isolation for females ($X^2(3) = 11.80, p = 0.01$), and feelings of isolated for both males and females ($X^2(3) = 17.95, p = 4.52e^{-04}$). A logistic regression analysis was performed to assess the relationship between self-reported feelings of isolation and self-reported heart problem for both females, and the combined male and female group. A significant logistic equation was identified for males and females, ($p = 0.01$) with an $R^2 = 0.05$. Males and females predicted likelihood of a reported heart problem is equal to $-2.56 - 0.022(\text{Hardly ever feels isolated}) + 0.54(\text{Sometimes feels isolated}) + 2.09(\text{Often feels isolated})$. A logistic regression analysis for self-reported heart problems and males' happiness failed to reach significance. Likewise, the logistic regression for females self-reported feelings of isolation and self-reported heart problems failed to reach significance.

Chi-squared results Heart Problems and Loneliness				
Variable		df	χ^2	p-value
<i>Male</i>				
	Happiness	4	11.05	0.03
<i>Female</i>				
	Feeling Isolated	3	11.8	0.01
<i>Combined</i>				
	Feeling Isolated	3	17.95	4.52E-04

Table 4 Loneliness variables which reached statistical significance after controlling for confounding variables.

Systolic blood pressure and social isolation

Results of the Pearson's correlation analysis revealed two significant relationships for systolic blood pressure. For males, marital status was found to be significant ($r= 0.16, p=0.02$). For both males and females, attending religious services was found to be significant ($r=-0.009, p=0.05$). Neither variable was able to produce a statistically significant linear model.

Pearson's correlation results for Systolic Blood Pressure and Social Isolation			
Variable	r	p-value	
<i>Male</i>			
	Marital Status	0.16	0.02
<i>Combined</i>			
	Attending Services	-0.009	0.049

Table 5 Social Isolation variables that reached statistical significance.

Systolic blood pressure and loneliness

Results of the Pearson's correlation analysis revealed two significant relationships for systolic blood pressure. For males, happiness was found to be significant ($r = -0.18, p = 0.01$). For females, feeling isolated services was found to be significant ($r = -0.17, p = 0.01$). No significant relationships were found within the male and female groups. A simple linear regression was calculated to predict Systolic blood pressure based on males' happiness. This model failed to reach statistical significance. A second linear regression was calculated to predict systolic blood pressure based on females' feelings of isolation. For this relationship a significant regression equation was found ($F(3,204) = 3.265, p = 0.02$), with an R^2 of 0.03. Females' predicted weight is equal to $126.32 - 6.96(\text{Hardly ever isolated}) - 9.60(\text{Sometimes isolated}) + 0.43(\text{Often isolated})$.

Pearson's correlation results for Systolic Blood Pressure and Loneliness			
Variable		r	p-value
<i>Male</i>			
	Happiness	-0.18	0.01
<i>Female</i>			
	Isolated	-0.17	0.01

Table 6 Loneliness variables that reached statistical Significance.

Limitations

This study had a number of limitations. The self-reported measure of heart problems may have been too broad. The only criteria offered to respondents was that they had been given this information from a medical doctor. Respondents could have under or over reported heart problems based on how they interpreted the question, and information they received from their GP. A more conclusive comparison could use specific diagnoses from medical records or claims. The Likert scale ratings for loneliness are also subject to interpretation. Phrases such as

‘often’ and ‘some of the time’ could be interpreted drastically differently from subject to subject. A more effective measure may reframe the items in terms of satisfaction with these interactions.

Discussion

The results of the data analysis offered inconsistent support for a relationship between cardiovascular disease and measures of social isolation and loneliness. Males showed limited correlation between social isolation and loneliness measures and both heart health variables. Furthermore, variables that were found to be significant typically focused on measures such as marital status and general happiness. Variables which included more specific measures of time spent on social activities and feelings on one’s relationships were predominately non-significant. The only exception to this trend was the relationship between volunteering and self-reported heart problems, prior to accounting for controls, and one’s families’ understanding their feelings after accounting for controls. Prior to accounting for controls women’s measures of heart health correlated with a wider range of social isolation and loneliness measures.

These data, along with the existing body of literature, suggests the greatest barrier to implementing effective social prescribing is the lack of consistent, validated evidence. The current evidence provides the strongest support for utilizing social prescribing only as a supplement to traditional care when it aligns with the patient’s goals. GPs should be cautious not to overstate the potential health benefits to the patient.

NHS should take steps to improve the quality of evidence surrounding social prescribing. Funding and resources may better spent on policy initiatives such as the National Academy of Social Prescribing, than in the development of individual programs. A greater body of evidence

would help government and healthcare officials make more informed choices regarding future funding initiatives. Under the NHS's current trajectory, there is a risk of developing infrastructure and resources that ultimately do not fulfil their intended purpose. The NHS may find that considerable funding has been spent on resources that fail to produce benefits in patient outcomes or cost control.

This goal could be further aided by establishing a national database of social prescribing Patients through electronic health records (EHR). This database could help fill in gaps of information which limit current research. An effective database should account for information including, demographics, geographic location, diagnosis, program referrals, and program attendance. Such a database could improve research design by allowing for larger cohorts matched across factors such as diagnosis and program.

Conclusion

Social prescribing is a novel form of healthcare that attempts to address patients' health issues while promoting socialization and general well-being. The NHS has made considerable efforts to build-out social prescribing infrastructure. While GPs are being encouraged to promote the practice with their patients, the poor evidence base remains a barrier to effective utilization. Questions remain regarding whether chronic illnesses can be positively impacted by social prescribing. The efficacy of individual social prescribing activities also requires further analysis. The NHS has ambitious goals for expanding its social prescribing programs. However, these efforts appear premature given the lack of evidence supporting them. To develop an effective social prescribing program, current efforts should be focused on refining the means of data collection and developing a more robust body of literature.

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