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1 Social Prescribing for Frequent Attenders in Primary Care: An Economic Analysis

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8 **Keywords: Link Worker, Frequent Attendance, Primary Health Care, Social Prescribing,**
9 **Costs**

10 Abstract

11 Background: Social prescribing (SP) is a mechanism to link patients with community groups and
12 third sector organisations. It offers a complimentary approach to the traditional medical models to
13 address psychosocial needs of patients more effectively and in turn aims to reduce demand on the
14 NHS. The aim of this study was to explore the economic benefits related to changes in the use of
15 healthcare resources following a social prescribing intervention in four primary care practices in
16 Wales.

17 Methods: Quantitative data from routine healthcare usage was collected from the 78 participants pre
18 and post intervention. The participants were grouped into frequent attenders (FA) ($n=21$) and
19 frequent ($n=57$) non-attenders (FNA), and a cost analysis was conducted to estimate cost variances
20 based on healthcare unit usage over the length of the pilot intervention. These were then extrapolated
21 forward to identify potential healthcare savings.

22 Results: The SP as an intervention generated the largest cost saving for FAs. The cost variance when
23 FAs participated in the intervention shows there is a direct cost saving of £6,113 or £78.37 per
24 participant over the five months of the intervention.

25 Conclusions: Results suggest there may be a cost saving associated with SP interventions, however
26 caution should be exercised in interpreting the results due to the lack of control group in this study
27 The cost saving were largest for FAs, where the intervention reduced healthcare unit usage as well as
28 actual and inferred impact on associated healthcare costs. This suggests that in practice to generate
29 the maximum cost benefit SP interventions could be targeted at FAs.

30 Introduction

31 The health and social care budget in Wales is almost 50% of the devolved budget [1]. In Wales, the
32 number of people aged 65 and over is projected to increase by 37% in the next 20 years [2]. Poor
33 health is linked to social and economic disadvantage, resulting in health inequalities [3]. Wales has
34 the highest rates of long-term limiting illness in the UK, the most expensive facet of NHS care [4]
35 and there is a more prescribed medication in deprived areas coupled with a higher prevalence for
36 mental health problems [5]. The Welsh Government has put in place a number of legislations
37 recognising the role of non-clinical support as a key part of a social model of health and wellbeing.

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38 These are the Well-being of Future Generations (Wales) 2015 and Social Services and Well-being
39 (Wales) 2014 Acts and a National Primary Care Plan [6].

40 Social Prescribing (SP)

41 It has been argued that psychosocial issues and long-term conditions can be better managed in the
42 community [7]. Social prescribing (SP) is ‘a mechanism for linking patients with non-medical
43 sources of support within the community’ such as charities, the voluntary sector, and community
44 groups [8], all of which can offer an alternative to the traditional medical models and reduce the
45 burden on the NHS. SP is a current priority for all of the devolved Nations. The Welsh Government
46 ‘Social Prescription Model’ aims to improve the mental health support available to people with low
47 to moderate mental health issues. In England SP is referenced in the long-term plan with social
48 prescribers or ‘link workers’ embedded in primary care networks [9]. Social prescribing interventions
49 are often targeted at people in socioeconomically deprived areas, broadening the options available for
50 primary care when patients present with needs related to wider social determinants of health [10].
51 Our research has found that these patients are often the most frequent GP attenders with the greatest
52 complex needs [11].

53 There are multiple benefits for patients accessing social prescribing, including increased self-esteem,
54 confidence and sense of control, empowerment, improved psychological and mental wellbeing and
55 mood, and reduced symptoms of anxiety and depression. In addition to this, patients are able to
56 become more active in managing their conditions, resulting in less reliance on the NHS. This is
57 particularly the case for marginalised groups such as mental health service-users and older adults at
58 risk of social isolation [12, 13]. Accessing a broad range of community-based services can also help
59 patients’ self-manage long-term chronic conditions and reduce health inequalities, particularly for
60 vulnerable and socially deprived groups who face barriers to accessing appropriate health services
61 [14, 15].

62 Evidence examining the impact of social prescribing on the health service is limited, and the research
63 that is currently available has found mixed results. For example, whilst some evaluations of social
64 prescribing schemes have found reductions in A&E attendance and demand for GP services [16],
65 others have generated little evidence of positive impact. For example, one study found no significant
66 difference in the frequency of GP visits or the number of repeat prescriptions before and after
67 completion of a social prescribing intervention [17].

68 Whilst there is a growing evidence base of the positive health and wellbeing outcomes of social
69 prescribing. The evidence for economic impact is mixed. This study aims to evaluate the cost
70 variances based on healthcare unit usage before and after a pilot social prescribing intervention.

71 Methods

72 The data for this economic evaluation of a pilot SP intervention was collected over 5 months across
73 four GP practices located in areas of high deprivation in Wales.

74 Patients were referred to two social prescribers by GPs at the practices. No strict inclusion and
75 exclusion criteria were given regarding which patients to refer. Rather, this was left to be determined
76 according to the discretion and clinical judgement of the GPs. The pilot was funded by the Welsh
77 Government to test a social prescription model.

78 The two social prescribers involved in the pilot saw a total of 78 patients over the 5 months of the
 79 intervention via face to face appointments. This cohort were subdivided into two groups: frequent
 80 non-attenders ($n=57$) and frequent attenders ($n=21$). Frequent attenders (FA) are expected to have on
 81 average 30 face-to-face GP consultations over 2 years [18]. Using this criteria and applying it to the
 82 sample in this study FAs are defined as participants who had attended 15 or more GP appointments
 83 over the previous 12 months. The rationale for taking this approach was that there is evidence that FAs
 84 are the most prolific users of healthcare resources, therefore we wanted to understand if there was a
 85 greater cost saving for this group of patients compared to standard usage.

86 Referring condition and routine clinical data; GP appointments, current condition, and details of any
 87 prescribed medication was extracted from Practice IT systems for each participant 12 months prior to
 88 and at the end of the intervention. Data was anonymised before extraction with unique ID codes. A
 89 cost variance analysis was undertaken.

90 Results

91 The referring conditions are displayed in Table 1. The largest proportion of participants (33%) were
 92 referred due to low mood and isolation difficulties, followed by anxiety and associated social issues
 93 (31%), depression and social difficulties (22%) and finally stress and associated social issues (14%).

94 **Table 1. Referring Condition**

Conditions by categories	N	Percentage
Anxiety and social issues	24	31%
Depression and social difficulties	17	22%
Low mood and isolation	27	33%
Stress and social issues	10	14%
Total	78	100%

95

96 The total number of GP appointments and prescriptions dispensed for all the 78 participants are
 97 presented in Table 2. Results are presented for 12 pre-intervention, monthly average per participant
 98 pre-intervention, total of all participants over the 5 months of the intervention along with the variance
 99 in healthcare unit usage. Results indicate that there is a reduction in GP appointments by 4.74 per
 100 participant.

101 This variance in the number of GP appointments pre and during intervention and if extrapolated over
 102 the next 12 months has a projected saving of approximately £4,823 per annum when applying the
 103 suggested unit costings of GP cost per clinic consultation lasting 17.2 minutes, which is £53 [19]. A
 104 similar trend was identified for prescriptions dispensed with associated cost savings of £1,290 per
 105 annum, based on prescription costs of £43 per consultation (net ingredient cost) when applying the

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106 suggested unit costings [19]. Examination of the cost variance when clients received the social
107 prescribing intervention shows that there was an overall direct cost saving of £6,113 or £78.37 per
108 participant. Extrapolating this variance over a 12-month period, should circumstances remained
109 constant there is a likely cost saving of £78.20 per participant or a total of £6,099.60 per annum. This
110 is compared with healthcare unit usage in the preceding 12-month period and represents the effects of
111 participating in the SP intervention. Healthcare unit usage and costs outlined in Table 3.

112 **Frequent non-attenders (FNA)**

113 The FNA subgroup of the sample consisted of 57 participants all had attended less than 15 GP
114 consultations in the previous 12 months. When monthly averages of healthcare unit usage and costs
115 are examined per FNA, there is a slight upward trend in cost average per month related to healthcare
116 unit usage. Results suggest an average cost of £47.35 per FNA in the previous 12 months compared
117 to a monthly average of £53.44 over the 5 months of the intervention. Once costs are extrapolated
118 and inferred for the 12 months following the intervention, there is an increase in costs from £568.24
119 to £635.40 per annum and a projected increase in costs of £67.16 per frequent non-attender or £3,828
120 for all 57 FNAs. These estimates suggest that the intervention is not as effective and efficient in
121 reducing healthcare unit consumption for the FNA participants and indicates that, following an SP
122 intervention, they are likely to increase their healthcare unit usage and the associated costs of this.

123 **Frequent Attenders (FA)**

124 For comparison the healthcare unit usage (GP appointments and number of prescriptions) for the 21
125 FAs pre intervention was examined and indicated that they had a total of 535 face-to-face GP
126 consultations in the previous 12 months, equating to a monthly average of 44 appointments or FA's
127 an average of just over 25 appointments per person. Therefore over the 5 months of the intervention
128 there is an overall direct cost saving of £6,113 or £78.37 per FA there is a significant reduction in GP
129 appointments and prescriptions dispensed. Application of the recommended unit costings of GP
130 appointments [19], and a variance in GP appointments would have a projected total cost difference of
131 approximately £8,109 or £1,621.80 per month or £77.22 over the 5 months of the intervention or
132 £497 per FA per annum. A similar downward trend was identified with prescriptions dispensed pre
133 and during the intervention with associated cost difference of £1,677 when applying the suggested
134 unit costings [19].

135 Inferred costs over a 12-month period post intervention based on the reduction in healthcare usage
136 and should all things remain equal the likelihood there could be a cost of a reduction to £1,154 per
137 FA per annum. When compared with costs per FA in the previous 12 months of £1,651 per annum
138 per FA there is a reduction of £497 per FA per annum. Therefore, should all things remain equal in
139 the subsequent 12 months post intervention there is inferred cost difference, which is total cost for all
140 FA over 12 months minus the projected healthcare usage cost in the next 12 months (£34,676 –
141 £24,247 =£10,429) as outlined in Table 4.

142 **Discussion**

143 The pilot SP intervention in this study was delivered over 5 months and involved a total of 78
144 participants. In order to examine the effect of the intervention and estimate its impact, participants
145 were divided into two subgroups FAs and FNAs. Associated costs were then calculated based on
146 healthcare unit usage defined as GP consultations and prescriptions dispensed.

147 Results indicate for all of the patients who participated in the intervention there was a direct cost
148 saving of £78.37 per participant or £6,113 for the total cohort over the 5 months of the intervention.
149 Extrapolating these reduced costs over a 12-month period shows that there could be potential cost
150 saving for the entire cohort (n=78), of £6,099.60 or £78.20 per participant in reduced healthcare unit
151 usage per annum.

152 Conversely, when the cohort were subdivided into two distinct groups, FAs and FNAs, results
153 indicated variances between the two. Estimation of monthly average costs for each FNAs while on
154 the intervention and inferred for the following 12 months, the estimates suggest that per annum there
155 would be an *increase* in costs. However, among the FA's group (n=21) results suggest that the
156 intervention had a considerable influence on *reducing* healthcare unit usage and costs. Twelve month
157 projections taking account of potential changes in unit of healthcare usage suggests that, should all
158 things remain equal, there should be a cost reduction of £497 per FA patient per annum. Hence,
159 should all things remain equal in the following 12 months post intervention there would be a
160 contingent cost reduction of £10,429 for all of the FA's as a result of reduced healthcare unit usage.

161 One possible explanation for the results is improved Patient Activation (PA). PA has become a
162 popular construct in public health and management of long-term conditions in recent years. PA is
163 defined as knowledge, "skills and confidence a person has in managing their own health and health
164 care" [20]. Having the skills and knowledge of one's own conditions can lead to a better level of
165 activation [21, 22] and having higher levels of PA positively contributes to patients' management of
166 health conditions [23].

167 PA is also a suggested key mechanism in ensuring the effectiveness of SP interventions in achieving
168 improved outcomes for patients [24]. This has also been found in qualitative evaluations of SP
169 interventions [25, 26]. SP emphasises patient choices and empowerment by using a range of
170 therapeutic and behavioural change techniques such as coaching, motivational interviewing and
171 empathetic listening skills in order to create the core conditions needed to promote behaviour change
172 [27]. This is a key feature that supports patients in their journey towards activation and behaviour
173 change. SP has also been shown to significantly improve PA scores for over 50s with long terms
174 conditions, yet no economic or healthcare utilisation benefit was identified in this study [28].
175 Therefore, it can be hypothesised FAs increased their PA through taking part in the intervention
176 resulting in better self-management of their presenting health conditions leading to less healthcare
177 usage, reduced GP appointments and prescriptions. Conversely findings for the FNAs a marginal
178 increase in health care unit usage and associated costs can still be explained by increased PA in this
179 group of patients. If those patients become more activated, they may visit the GP more as a way of
180 actively managing their health condition.

181 This economic evaluation of this pilot SP intervention demonstrated there are cost savings
182 particularly for FAs taking part in a SP intervention. Extrapolation of estimates and forward
183 projection indicates that the SP intervention in this study could potentially yield greater cost savings
184 and benefits if delivered over a longer period, particularly when aimed at specific cohorts. The cost
185 information may be of use to decision makers in determining the allocation of finite resources, whilst
186 also providing information on the benefits of alternative non-clinical services that have both health
187 and wellbeing effects and a positive impact on resource use.

188 Whilst FAs may have the largest number of needs and represent the biggest burden on GP practices,
189 they are also the group that produced the biggest savings in the current study, both in terms of
190 reduced GP appointments and demand on practice staff time. These patients' issues require more than

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191 a ‘quick fix’, and they require a much more person-centred approach. This could be a challenge for
192 social prescribers, who may not be trained nor have the competence to deal with such complex
193 issues. Further research should investigating if different SP delivery lengths are more appropriate for
194 FAs and explore “dose–response” relationship “minimum duration for maximum benefit” to
195 maximise patient outcomes and the cost benefits.

196 Although it is widely acknowledged that social and economic factors affect health outcomes, and
197 there is limited evidence on the economic benefits of SP intervention addressing public health needs.
198 The cost analysis findings in the present pilot SP intervention are consistent with previous studies
199 which have demonstrated a cost reduction following SP as a result of fewer GP appointments and
200 reduced use of prescription medication [29]. Furthermore, social prescribing alleviates immediate
201 time, infrastructural and monetary pressures from GPs, the NHS and other parties involved in
202 primary care [30]. Evidence also suggests that social prescribing positively impacts upon GP time
203 and therefore has a cost saving in this way. The freeing up of GP capacity can have positive effects
204 on patient safety and staff morale, along with reductions in stress [31]. Ultimately, taking alternative
205 approaches to meet the needs required in primary care can reduce pressure for GP appointments and
206 services [32], and future studies should undertake a comprehensive cost benefit evaluation which
207 would allow for a more objective assessment of the value of SP and explore whether there is an
208 association with increased PA and positive health outcomes for patients.

209 **Limitations and Implications**

210 This was a 5-month pilot, which was determined by limited funding scheme rather than the clinical
211 need of patients or the available evidence regarding the most effective length of time to run a social
212 prescribing intervention. Because of this, there was not enough time for the programme to be
213 embedded within all practices, leading to peaks and troughs in referrals as practices got more
214 engaged. It is recommended that future pilots are extended to at least 12 months to allow the
215 intervention to fully embed in GP practices. Due to the necessity of needing to provide the
216 intervention to all eligible patients there was no control group therefore conclusions can only be
217 tentative. Based on the need to evaluate the intervention in situ and the reliance on practice staff to
218 add the correct information to the system, and to download the relevant information, this resulted in
219 incomplete data sets for intervention participants therefore confidence intervals around estimates
220 could not be conducted. This is an ongoing challenge in ‘real-world’ cost analysis where researchers
221 are reliant on doing post hoc evaluations on the best data available. As a result, we were unable to
222 gather detailed data and other quality indicators, cost analysis was conducted at the end of the
223 intervention, therefore the researchers were not able develop a data collection protocol prior to the
224 intervention being conducted therefore the criteria for the Equator CHEERS checklist could not be
225 met. Future studies should where possible ensure that economic evaluation quality guidance such as
226 (CHEERS) is followed for study development and set up prior to conducting the evaluation to
227 improve the data quality. However, despite these limitations even in the short time of the intervention
228 the data does appear to demonstrate that there is a reduction in healthcare unit usage and a cost
229 saving. However, without further data it is difficult to know whether the frequent attendance is
230 temporal rather than persistent and continuous over time. A longer timeframe would mean that more
231 patients could be referred to the intervention, allowing more data to be collected and the testing of the
232 assumption that it does indeed improve patient outcomes and reduce the frequency of attendance.
233 Finally, controlled trials are also needed to observe causality, and to explore whether the outcomes
234 found in the current study are replicable.

235 1 Conflict of Interest

236 The authors confirm the following statement:

237 *The authors declare that the research was conducted in the absence of any commercial or financial*
 238 *relationships that could be construed as a potential conflict of interest.*

239 2 Author Contributions

240 Conceptualization, C. J., and M.L.; methodology, M.L., C.J.; resources, C. J. formal analysis, M.L.;
 241 writing plus review and editing, M.L. and C.J.; All authors have read and agreed to the published
 242 version of the manuscript.

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 246 services in order to prototype and test innovations to improve services. The I2S fund operates
 247 alongside the Welsh Government Invest to Save fund, a repayable, interest-free, loan which
 248 successful I2S projects can apply for.

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252 8 References

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343 **Data Availability Statement**

5 **Social Prescribing for Frequent Attenders in Primary Care: An Economic Analysis**

344 The processed data required to reproduce the above findings cannot be shared at this time due to
345 ethical reasons.

Tables

Table 1. Referring Condition

Conditions by categories	N	Percentage
Anxiety and social issues	24	31%
Depression and social difficulties	17	22%
Low mood and isolation	27	33%
Stress and social issues	10	14%
Total	78	100%

Table 2. The number of GP appointments and prescriptions dispensed

	N	Total for 12 months pre-intervention for all participants	Average per participant per annum pre-intervention	Total for all participants over 5 months of intervention	Average per participant over 5 months of intervention	Variance in healthcare unit usage
GP appointments	78	979	12.55	370	4.74	91
Prescriptions dispensed	78	342	4.38	130	1.67	30

Table 3. Healthcare Unit costs for entire cohort

	N	Total for 12 months pre-intervention for all participants	Total cost per annum pre-intervention for all participants	Total monthly average cost	Cost for all participants over 5 months of intervention	Total monthly average cost	Average cost per participant over 5 months of intervention	Projected costs per participant over 12 months post intervention	Projected costs for all participants over 12 months post intervention
GP appointments	78	979	£51,887	£4,323	£19,610	£3,922	£251.22	£602.92	47,027
Prescriptions	78	342	£14,706	£1,225	£5,590	£1,118	£71.81	£172.34	13,442

dispensed									
Total	78	1,321	£66,593	£5,548	£25,200	£5,040	£323.03	£775.26	60,469

Table 4. Pre and post intervention cost analysis for FA

	N	Total for 12 months pre-intervention for FA	Total cost per annum pre-intervention for all FA	Total monthly average cost	Average per FA per annum	Average cost per FA over 5 months of intervention	Projected costs per FA over 12 months post intervention	Projected costs for all FA over 12 months post intervention
GP appointments	21	535	£28,355	£2,363	£1,350	£401.28	£963	20,223
Prescriptions dispensed	21	147	£6,321	£526.75	£301	£79.85	£191.64	4,024
Total	21	682	£34,676	£2,889.75	£1,651	£481.13	£1154.64	24,247