Arts on Prescription: Observed changes in anxiety, depression, and wellbeing across referral cycles.

Objectives: Arts on Prescription (AoP) interventions are part of mainstream social prescribing provision in primary health care. Whilst the body of evidence for AoP interventions has been developing, this has primarily focused on wellbeing.

Study Design: The present work is an observational longitudinal study on a community-based AoP social prescribing intervention in the South West UK.

Method: The present study assessed changes in anxiety, depression, and wellbeing in a cohort of patients participating in up to two eight-week cycles of AoP. The sample consisted of 245 individuals referred into the programme from 2017 to 2019, with a sub-sample of participants (*N*=110) with identifiable multimorbidity. Outcomes were measured pre- and post-intervention at both initial and re-referral.

Results: Anxiety, depression, and wellbeing were all significantly improved after initial referral, re-referral, and overall from initial to post re-referral for this intervention in the whole sample and multimorbid sub-sample. Multivariate analyses revealed that no participant variables appeared to account for the variance in outcome change scores.

Conclusion: The research provides further support for AoP interventions, finding associations with reduced anxiety and depression and increased wellbeing. Additionally, these outcomes are evidenced in those with multi-morbidity, as well as across initial- and re-referral cycles.

Keywords: Arts for health; Mental health; Primary care; Social prescribing; Wellbeing

Introduction

Social prescribing refers to the formal referral to adjunct non-clinical interventions to support wellbeing for primary care patients (1-3). Implemented to specifically address growing multi-morbidity within primary care settings (4), social prescribing programmes cover exercise on prescription, arts on prescription (AoP), book clubs, education on prescription, and green gyms to name just a few (1). In an ageing population, primary care patients are increasingly presenting to their General Practitioners (GPs) with complex needs; spanning physical, mental, and social health and wellbeing concerns (5). Social prescribing programmes are becoming mainstays of clinical commissioning groups across the UK, and are being integrated into the strategic plans of the UK's National Health Service (6). Referral into these programmes is provided as an adjunct to standard primary care for those patients that are identified as either having complex care needs (such as multi-morbidity), or have identified psychosocial morbidity such as loneliness or social isolation (7-9).

AoP interventions are popular schemes provided under the broad offer of social prescribing in primary care in the UK, and are increasing across the world, including in Europe, North America, and Australasia (1, 10-12). Unlike art therapy, AoP interventions provide opportunities for participants to engage in community-based arts classes to learn and engage with artistic skills (e.g. watercolours, singing, mosaics, ceramics). The intervention groups are led by artists from the local community, and participants are referred for holistic health reasons such as isolation or recent bereavement. This is in contrast to other schemes such as exercise on prescription where patients are commonly referred for specific clinical criteria (e.g. coronary care, diabetes). This mixed-group approach provides "medical anonymity", which has been cited as an important factor in their acceptability to participants in qualitative work (13, 14). Moreover, the locality-based organisation of these groups helps to provide social interaction that may be sustained beyond the intervention, by allowing members of the community to gain new social connections. Distinct from art therapy, there is no implemented therapeutic process involved with AoP interventions, rather participants are encouraged to engage in the activities for "art's sake" (13). Gaining traction across the world, AoP interventions are now supported by a solid and convincing evidence-base showing associations with improvements in wellbeing, even in those with complex medical needs (15). There is also a substantial evidence base from qualitative research that identifies positive benefits of engagement for perceived changes in wellbeing, self-confidence, social interaction and integration, and purposeful activity (13, 14, 16). Despite this evidence however, it has become apparent that there are some individuals for whom AoP interventions may not provide improvements in wellbeing. Recent work has sought to uncover the reasons for this, and has found that pre-intervention wellbeing appears to be a critical component of whether or not participants attend, engage, or experience increases in wellbeing, with observations of those lower in initial wellbeing having difficulty in attending and engaging, but also potentially having most to gain (17). Expanding on this, qualitative work has shown that there may be two distinct reasons that some may not experience improvements in wellbeing from such interventions (18). Firstly, there are some that find the social element of the interventions to be unduly challenging; citing difficulties in integrating into and interacting with their groups. A second reason appears to be that some participants feel anxious at the end of their intervention, having otherwise enjoyed their course. These individuals cite feelings akin to bereavement or abandonment that may obscure an otherwise positive and beneficial experience (18). Currently, there are no specific screening criteria or risk assessments involved with many social prescribing modalities and programmes, including the programme described herein.

While social prescribing schemes are recognised to be effective in supporting and increasing patient wellbeing, studies examining clinical measures are lacking. One small study has observed reductions

in GP visits and hospital admissions (19). Another recent study in a small number of patients found a social prescribing intervention to be associated with improvements to self-esteem; however, in terms of general practice workload and polypharmacy prescribing, no improvements were attributable (20). Whilst wellbeing is being recognised as an important component and predictor of overall health (21), it is also important to establish whether such interventions may be associated with alleviations to clinical markers such as anxiety and depression. The present study was designed to establish whether participation in an eight-week AoP intervention was associated with changes to levels of anxiety and depression. To anchor the findings of the present study to existing literature, similar analyses were also carried out using wellbeing as an outcome. With a well-established AoP programme forming the intervention, the present study comprises an evaluation of changes to levels of anxiety and depression in primary care patients. Moreover, continuing prior work (15), the present study set out to examine these outcomes in those participants that are identifiable as having multi-morbidity. Finally, the study utilised data from two cycles of this AoP intervention, and tracked participants that were re-referred to assess their trajectory of change over time, providing a longitudinal analysis of the programme. This last aspect is of interest to the wider literature on social prescribing, where patients are now very frequently being re-referred either in to the same programme, or re-referred to another social prescribing programme in a bid to provide longer-term support (10).

Method

Design

This observational study draws on data collected from a continuing AoP intervention programme based in the South West UK as the intervention. Patients are referred into the intervention for a variety of reasons, but principally to support their health and wellbeing as an adjunct to standard primary care services. Within the specific location of the study, the intervention is part of mainstream social prescribing provision in primary care, and patients may elect for referral or not. Other types of social prescribing in the region include a variety of different community-based recreational activities, of which this specific AoP programme is one. The intervention itself provides up to two referrals of an eight-week course of arts, where participants may engage with visual (e.g. painting, ceramics, mosaics, photography) or performing (e.g. playwrighting, creative writing, singing) arts once per week. For more information regarding the intervention and its referral process, see Crone et al. (15, 22). The study set out to assess whether levels of anxiety and depression, as well as wellbeing, were improved after participating in community-based arts. The

study also sought to assess whether these changes were also present in those identifiable as multimorbid. Additionally, we aimed to assess these changes over time by examining more than one referral cycle, where data were available. Data were collected from participants from point of referral to post-participation feedback. Sociodemographic (e.g. age, sex, occupation status, postcode) and clinical (e.g. reasons for referral) data were recorded via anonymised referral forms completed by referring professionals (GPs, social prescribers, nurses, and other health care workers). Pre and post levels of anxiety, depression, and wellbeing were collected by participant self-report on the first and last day of the intervention in each referral cycle. Participants' data were linked through each referral cycle by anonymous codes specific to the scheme. The study methods were approved by the National Health Service Local Research Ethics Committee and the Gloucestershire Clinical Commissioning Group, R&D Reference: 08/GPCT01/SE.

Participants

Participants were eligible for inclusion in the study if they were referred for this AoP intervention from the Gloucestershire area, and provided consent at point of referral. Primary care patients can choose from a variety of different recreational activities throughout the county, the present programme being just one. Participants will choose which type of activity they feel they may wish to take part in, and therefore (despite being formally prescribed) self-select into a specific type of activity within the AoP offer where choice is available. The present study advances recent similar studies based on this intervention (15, 17) where only wellbeing was available as an outcome, and so only data subsequent to those analyses (2017 to 2019) were included. Primary care patients are referred to this intervention principally to increase overall wellbeing, to support either clinical or psychosocial needs.

Sample characteristics

The anonymised referral forms for the intervention listed the participants' age, sex, occupation, and postcode. Postcode was used to derive participants' Index of Multiple Deprivation (IMD) from the latest available government data (23), which were then sorted into quintiles from "highest" to "lowest" level of deprivation (Table 1 provides a categorical breakdown). Additionally, the referral form provided information as to the reason for the referral: reduce stress/anxiety/depression; improve self-esteem/confidence; improve social networks; help alleviate symptoms of chronic pain or illness; distraction from behaviour related health issues; improve overall wellbeing; support following loss or major life change. Participants could be referred for as many reasons as the referring practitioner deemed appropriate, and so they are treated as one continuous variable of "number of referral reason" for the purposes of the present analyses. Additional supporting

information was used to identify whether or not individuals presented with multimorbidity, using methods reported elsewhere (15).

Psychological measures

Anxiety was measured using the Generalised Anxiety Disorder Scale (GAD-7: 24), which has been validated for use in general and clinical populations (25, 26). The scale ranges from zero to 21, with scores of ≥5, ≥10, and ≥15 indicating mild, moderate, or severe anxiety symptomology (25). Here, the GAD-7 exhibited excellent internal consistency for both pre- and post- measurements at T1 (α=.83, .87) and T2 (α=.91, .93). Depression was measured using the Patient Health Questionnaire eight-item version (PHQ-8), a scale validated for use in the general population (27). The scale was developed to assess eight of the nine diagnostic criteria of depression as outlined by the fourth edition of the Diagnostic and Statistical manual of Mental Disorders (DSM-IV), ranges from zero to 24, and has score cut-offs of: 0 to 4 indicating no significant depressive symptoms; 5 to 9 indicating mild symptoms, 10 to 14 for moderate, 15 to 19 for moderately severe, and 20 to 24 indicating severe (27). The scale provided excellent internal consistency in both pre- and post- measures at T1 (α=.84, .85) and T2 (α=.83, .89) in the present cohort. Wellbeing was assessed using the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS: 28). This is a 14-item measure that has been used widely in similar research, and is validated for use in general population samples of participants and is sufficiently sensitive for application in intervention evaluation (29). The scale ranges from 14 to 70, and provided an excellent internal consistency in the present sample at both pre- and post-measurement points at first referral (T1: α=.91, .90) and second referral (T2: α=.90, .92).

Data analysis

Study outcomes (anxiety, depression, and wellbeing change) were explored using paired-sample *t*-tests. For initial referral (R1) and re-referral (R2), pre and post measures for that specific referral (R1: T1, T2; R2: T3, T4) cycle were used in the tests. To assess change from point of initial referral to the end of re-referral, another batch of tests were run using the pre measure of initial referral (R1: T1), and the post measure of the re-referral (R2: T4). Comparisons between anxiety and depression score categories were carried out between data collection points using X^2 analyses with two-tailed significance, and relationships between the outcomes at each time point were assessed using two-tailed Pearson ρ correlations. Linear regression models were fit for a change metric of each outcome (pre score subtracted from post score) for initial referrals. Each model included age, sex, occupation, IMD quintile, and number of referral reasons as predictors. As indicated in prior research (17), baseline levels of wellbeing are associated with wellbeing outcome, and so were included in the regression model for wellbeing change. To account for potentially similar patterns, both anxiety and

depression pre scores were also included in their respective models. Analyses were undertaken using SPSS version 23 (IBM).

Results

Sample characteristics

Initial referral and re-referral

The sample comprised 245 primary care patients from Gloucestershire that received an AoP intervention between 2017-2019. The cohort were mostly female (*N*=196, 80%), had a mean age of 50.5 years (SD=15.71), were not currently working (*N*=184, 75.1%), and the lowest deprivation quintile was slightly over-represented (*N*=64, 28.3%) although a reasonably even representation across all quintiles was observed. The mean number of reasons for referral was 3.9 (SD=1.56), and participants had a mean baseline wellbeing (WEMWBS) level of 36.2±9.97, mean baseline anxiety (GAD-7) level of 12.4±5.58, and mean baseline depression (PHQ-8) level of 14.1±6.43. These baseline measures indicate the participants have suboptimal wellbeing compared to population norms, and clinically recognisable, moderate levels of anxiety and depression (25, 27, 30). Of those referred for the intervention, a further 96 (39.2%) were re-referred to this programme (R2) during this timeframe. Examining differences between the re-referred and those that were not revealed significant differences only in employment status ($X^2(2)=7.14$, $p=.028$), where there were larger proportions of working (29.5% versus 15.3%) and smaller proportions of not working (67.7% versus 80.0%) individuals in the re-referred subgroup compared to those not re-referred[1]. Mean time between initial referral and re-referral was 119.9±44.83 days. A summary of the demographic and clinical characteristics of the sample can be found in Table 1.

Multi-morbidity

Using methods reported elsewhere (15), it was possible to ascertain whether participants had multiple medical complaints across categories (e.g. cardiovascular disease, neoplastic conditions, neurological conditions, mental health/psychiatric conditions, musculoskeletal disorders). From these data, we were able to identify 110 (44.9%) of the whole sample as having multi-morbidity, although it is conceded that others within the sample may also be multi-morbid but may not have presented identifiable data. Similar demographic and clinical patterns were observed for the multi-

Table 1 Demographic profile of patients referred for the AoP intervention at initial- and re-referral, including multimorbid sub-sample

		Initial referral (R1) (T1, N=245)				Multimorbid R1 (N=110, 44.9%)				Re-referral (R2) (T2, N=96)				Multimorbid R2 (N=50, 56.2%)			
		N	%	M	SD	N	%	M	SD	N	%	M	SD	N	%	M	SD
Age				50.5	15.71			51.3	15.92			52	15.18			52.1	15.42
Sex (F)		196	80			94	85.5			79	82.3			42	84		
Art type	Visual	203	82.9			95	86.4			82	85.4			44	88		
	Other	42	17.1			15	13.6			14	14.6			6	12		
Occupation	Working	51	20.8			22	20			28	29.2			15	30		
	Not working	184	75.1			86	78.2			65	67.7			35	70		
	Not stated	10	4.1			2	1.8			3	3.1						
IMD Quintile	Highest	30	13.3			15	14.3			13	14.6			7	14.6		
	High	40	17.7			22	21			14	15.7			9	18.8		
	Medium	44	19.5			20	19			15	16.9			6	12.5		
	Low	48	21.2			19	18.1			15	16.9			10	20.8		
	Lowest	64	28.3			29	27.6			32	36			16	33.3		
N Referral reasons				3.9	1.56			4	1.57			3.8	1.59			4	1.58
Reduce stress/anxiety/depression (yes)		198	86.8			93	84.5			80	86			42	85.7		
Improve self-esteem/confidence (yes)		151	66.2			74	70.5			63	67.7			35	71.4		
Improve social networks (yes)		152	66.7			69	62.7			62	66.7			32	65.3		
Help alleviate symptoms of chronic pain or illness (yes)		99	43.4			60	54.5			45	48.4			33	67.3		
Distraction from behaviour related health issues (yes)		52	22.9			24	23.1			21	22.8			11	22.9		
Improve overall wellbeing (yes)		169	74.4			77	74			62	67.4			33	68.8		
Support following loss or major life change (yes)		56	24.7			24	23.1			22	23.9			11	22.9		
Anxiety (GAD-7) pre				12.4	5.88			12.8	5.93			12.0	5.91			11.8	5.73
Anxiety post				9.6	5.80			9.7	5.45			9.5	5.98			9.6	5.75
Anxiety change				-2.3	3.98			-2.2	4.68			-2.2	4.59			-2.2	5.16
Depression (PHQ-8) pre				14.1	6.43			15.4	6.11			13.2	6.42			13.8	6.14
Depression post				11.4	6.46			11.6	6.06			10.7	6.13			10.8	5.51
Depression change				-2.0	4.97			-2.6	4.99			-2.5	5.18			-3.0	5.70
Wellbeing (WEMWBS) pre				36.2	9.97			36.1	9.29			37.8	10.29			38.0	9.84
Wellbeing post				42.0	10.32			43.3	8.89			42.5	10.11			42.6	10.12
Wellbeing change				4.8	7.45			5.7	6.88			3.8	6.92			4.2	7.36

[1] Note that Table 1 provides data for all participants referred in the first column rather than just those referred only once, hence the discrepancy in N and % reported here.

Table 2 Inter-correlations of GAD-7, PHQ-8, and WEMWBS at each timepoint (T) in the referral (R) cycles.

	R1						R2					
	T1			T2			T3			T4		
	1	2	3	1	2	3	1	2	3	1	2	3
1. GAD-7		.79***	-.64***		.84***	-.63***		.84***	-.71***		.86***	-.64***
2. PHQ-8	.79***		.68***	.84***		-.69***	.84***		-.70***	.86***		-.71***
3. WEMWBS	-.64***	.68***		-.63***	-.69***		-.71***	-.70***		-.64***	-.71***	

* p <.05
**p <.01
***p <.001

Table 3 Anxiety and depression scale category membership across timepoints (T) and referral cycles (R), with tests of difference

		R1					R2					T1-T4 Test of difference
		T1		T2		Test of difference	T3		T4		Test of difference	
		N	%	N	%		N	%	N	%		
GAD7	Not categorised	19	9.5	32	23.2	$X^2(9) = 94.74$, p<.001	10	20.3	15	20.3	$X^2(9) = 57.06$, p<.001	$X^2(9 = 37.96$, p<.001
	Mild	54	22.5	39	28.3		21	23.9	25	33.8		
	Moderate	57	28.5	38	27.5		24	27.3	17	23.0		
	Severe	79	39.5	29	21.0		33	37.5	17	23.0		
PHQ8	No significant depressive symptoms	21	10.2	23	16.9	$X^2(16) = 101.50$, p<.001	9	10.5	11	14.9	$X^2(16) = 51.89$, p<.001	$X^2(16) = 58.79$, p<.001
	Mild	33	16.1	36	26.5		16	18.6	24	32.4		
	Moderate	41	20.0	27	19.9		24	27.9	20	27.0		
	Moderately severe	60	29.3	35	25.7		21	24.4	12	16.2		
	Severe	50	24.4	15	11.0		16	18.6	7	9.5		

morbid cohort, at both initial referral and re-referral (Table 1). Tests of difference (X^2 or one-way ANOVA as appropriate) did not determine any significant differences between the classified multi-morbid subgroup, and the "non" multi-morbid subgroup at T1 or T2, aside from comparisons for the referral reason "Help alleviate symptoms of chronic pain or illness" (X^2 (1)=11.74, p=.001; X^2 (1)=11.94, p=.001; at T1 and T2, respectively), suggesting that this sub-group benefited as much as all referred and re-referred participants.

Wellbeing, anxiety, and depression

Participants were observed to have significantly improved levels of anxiety, depression, and wellbeing after completion of this AoP programme. Both anxiety (GAD-7: 11.9 ±6.00 vs. 9.6 ±5.80, t=6.55, df=128, p<.001, d=0.39) and depression (PHQ-8: 13.4 ±6.46 vs. 11.5 ±6.45, t=4.54, df=129, p<.001, d=0.29) significantly decreased; and wellbeing (WEMWBS) significantly increased following participation (37.1 ±9.71 vs. 41.9 ±10.40, t=-7.86, df=147, p<.001, d=0.48). The scales at each measurement time (T) in each referral (R) cycle were highly inter-correlated, with very little fluctuation in relationship effect size across time points. Table 2 provides an overview of the intercorrelations of the measurements at each time point for the outcomes.

Examining the minimal clinical important difference (MCID) for the GAD-7, the threshold of four points on the scale (31) was not met from this single referral cycle. However, examining pre-post differences in clinical categorisation of the scale (as outlined above, and including those <5 as "not categorised"), shows a significant difference at R1 (X^2 (9)=94.74, p<.001). Similarly, the available MCID for the PHQ-9 (the 9-item version of the PHQ-8: 32) of five scale points was not met here. However, a significant difference was observed when comparing the category membership in post-scores compared to pre-scores (X^2(16)=101.50, p<.001). Table 2 provides an overview of these categories at each referral point and their tests of difference. Linear regressions were used to assess whether any participant or clinical characteristics were associated with the variance in outcome change scores (calculated by subtracting the pre- from the post-intervention scores for each scale). Only baseline measures of the outcome variable were significantly associated, indicating that the other measured participant and clinical variables were not associated with the outcome.

For those that were re-referred, these changes were observed again at re-referral when considering the pre- and post-intervention scores at R2 (anxiety: 11.7±5.87 vs. 9.5±6.02, t=4.08, df=72, p<.001,

d=0.37; depression: 13.2±6.23 vs. 10.7 ±6.21, *t*=4.02, *df*=71, *p*<.001, *d*=0.40; wellbeing: 38.6±9.92 vs. 42.4±10.16, *t*=-4.79, *df*=75, *p*<.001, *d*=0.38). When follow-up at re-referral (T4) is contrasted to the pre-intervention scores at initial referral (T1), the pattern remains. For this extended timescale, anxiety (11.8±6.05 vs. 9.9±6.02, *t*=2.73, *df*=57, *p*=.008, *d*=0.29) and depression (14.0±6.37 vs. 11.28 ±6.07, *t*=4.09, *df*=61, *p*<.001, *d*=0.43) both significantly decrease, and wellbeing significantly improves (37.4±9.77 vs. 42.3±10.17, *t*=-5.22, *df*=74, *p*<.001, *d*=0.50). Here, the MCID threshold relating to the GAD7 and PHQ-8 for R2 or across both cycles was not met. Significant differences in category membership for anxiety (X^2(9)=57.06, *p*<.001**)** and depression (X^2(16)=51.89, *p*<.001) were observed again for re-referral (R2), and across both referrals (T4 to T1: anxiety: X^2(9)=37.96, *p*<.001; depression: X^2(16)=58.79, *p*<.001), these are detailed in Table 2.

In the multi-morbid subgroup at initial referral, again both anxiety (12.0± 5.99 vs. 9.8±5.33, *t*=3.54, *df*=54, *p*=.001, *d*=0.40) and depression (14.3±6.00 vs. 11.7±6.10, *t*=3.92, *df*=57, *p*<.001, *d*=0.42) decreased; and wellbeing increased (37.3±8.84 vs. 43.0±8.89, *t*=-5.66, *df*=66, *p*<.001, *d*= 0.64). At re-referral (R2), all changes were statistically significant when comparing to R2 pre-intervention (T3) means (anxiety: 11.7±5.77 vs. 9.5±5.81, *t*=2.69, *df*=40, *p*=.010, *d*=0.38 ; depression: 13.9±6.12 vs. 10.8±5.57, *t*=3.40, *df*=40, *p*=.002, *d*=0.52; wellbeing: 38.4±9.94 vs. 42.6±10.12, *t*=-3.75, *df*=42, *p*=.001, *d*=0.42). Examining over the broadest timescale (i.e. re-referral (R2) at T4 compared to initial intervention T1), the same pattern of significant change is observed (anxiety: 12.1±6.44 vs. 9.8±5.74, *t*=2.19, *df*=31, *p*=.036, *d*=0.64; depression: 14.5±6.29 vs. 11.2±5.36, *t*=3.48, *df*=32, *p*=.001, *d*=0.56; and wellbeing: 36.6±8.6 vs. 42.4±10.11, *t*=-4.40, *df*=41, *p*<.001, *d*=0.61). The intervention appears to be as effective for those with multi-morbidity as those without, including when re-referred.

Discussion

The present study set out to assess the changes in anxiety and depression, alongside wellbeing, following an eight-week AoP intervention in a cohort of primary care patient participants. Extending previous findings (15, 22), the present study reconfirms the associations participating in this intervention has in improving wellbeing, but adds new information showing improvements in levels of anxiety and depression. Critically, and importantly for public health, the intervention appears to be associated with a reduction in anxious and depressive symptomology for many that attend as evidenced by the changes in symptomology categorisation at each assessment point. Further, multivariate analyses indicate that there are no particular groups of patients that may be more likely to benefit than others, providing good support for such interventions across broad primary care and demographic cohorts. Moreover, the present study supports the utility of an AoP intervention in improving anxiety, depression, and wellbeing in patients with multi-morbidity. Mental health is an important

component of physical health, both as an outcome in itself and as a contributor in the biopsychosocial paradigm of health (33), and so the present study not only provides additional clinically relevant evidence for AoP and social prescribing more broadly, but adds further understanding of how such programmes may contribute to health in a more mechanistic sense.

Contextualised against the growing literature on arts for health, the present work provides quantifiable support for mental health outcomes in addition to previously cited improvements in motivation, self-confidence, and aspiration (3, 8), finding purpose and empowerment (9), and overall improvements in mental health (16).

The observation of changes in each of these outcomes over the referral points is a finding that will likely be of interest in AoP, and more generally in the social prescribing literature. It can be seen from Table 1 that whilst at each post-intervention data collection point the relevant outcome (anxiety, depression, or wellbeing) has improved, by the time participants are re-referred, their pre- intervention level of each of these variables has almost rebounded to that of pre- initial intervention. This finding is similar to that observed in other longitudinal analyses of other AoP programmes in the UK (34) supporting the notion of rebound between intervention cycles. It may suggest that whilst these interventions are associated with improvements in these patient outcomes, that they may not necessarily be sustained post-intervention. Although this is difficult to assess with these data, as time between pre- initial referral (T1) and pre- re-referral (T3) is not standardised, this raises questions for the field in AoP and beyond into social prescribing. The observation of significant levels of anxious and depressive symptomology observable in the participants at programme onset (T1) is of note. Whilst social prescribing modalities are not provided instead of formalised primary or secondary care, and whilst the scales themselves were not administered diagnostically, nor are they recommended for use to that end (25, 27), it does raise questions as to whether screening may to an extent be appropriate for these referrals. It is arguably those that exhibit lower wellbeing have more to gain from such programmes, as we have seen previously with levels of wellbeing (17), there is also the element of not wanting to set patients up to fail that must be addressed in the broader practice and literature surrounding social prescribing. This is particularly of concern when contextualised against prior qualitative findings that have highlighted participants' anxieties concerning certain aspects of such programmes and how this may impact their overall outcomes (18).

Whilst the present study provides information into important clinical mental health outcomes in AoP, there are limitations that need to be considered when interpreting the findings. Firstly, as is the case for all studies of similar interventions, we cannot claim cause and effect with the results herein,and so randomised controlled trials are recommended to significantly advance the field. Regarding the analyses with the multimorbid subgroup, *N*s were too low to carry out multivariate analyses to assess the variance in outcome change, so this would be beneficial for future studies to assess.

Whilst the demographic profile of the cohort is somewhat typical for AoP studies, and for the geographic area in which the study was set (15, 17), further research in more diverse cohorts would be beneficial, particularly when considering whether demographic factors may play a part in the variance in outcome change. The finding of

rebound between referral cycles whilst not surprising, should be confirmed with future work, with careful control over the period of time between referrals to assess whether this is an artefact of time, or whether it may be associated with the feelings of caution and trepidation in exiting the intervention as reported elsewhere (18). The addition of examining multi-morbidity herein is an important addition to the literature, however sample size restrictions prevented multivariate analysis, and so further exploration of this particular subgroup when further data are available is needed. Finally, in keeping with recent developments in the literature (17), an examination of those factors associated with anxiety and depression level change in AoP participants would also be an important future direction to consider when sufficient data are available to support such analyses.

In summary, the present study set out to provide an assessment of whether participation in an AoP intervention is associated with improvements in anxiety and depression. To this end, we have found that this intervention is not only associated with improvements to levels of anxiety, depression, and wellbeing; but that it is also associated with a reduction in anxious and depressive symptomology. Importantly, we show that anxiety and depression can also be improved in those that present with complex medical needs as indexed by reported multi-morbidity. The study supports prior findings of improvements in wellbeing, in both the full sample and multi-morbid subsamples. We extend previous findings for this programme to provide a longitudinal analysis of more than one referral cycle, evidencing some degree of rebound between cycles in those variables assessed. Whilst the present study adds to the overall picture of understanding the utility and potential benefits associated with AoP interventions in primary care, there are still areas of assessment that are needed in order to provide further evidence for the efficacy of these programmes, in particular the nuances in patient response and patient perspectives on the role of these programmes for anxiety and depression symptom management.

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