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Integrating physical activity into the treatment of depression in adults: A qualitative enquiry

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Abstract

Around 246 million people globally suffer from depression. Physical activity (PA) can reduce the risk of depression by 30% and is recognised as an effective treatment for mild-to-moderate depression (MMD). However, a high proportion of patients with MMD are currently inactive and the implementation of PA as an adherent treatment for MMD is not well understood. This study contributes to a growing body of research exploring how to support people who are experiencing MMD to increase their PA levels (i.e. initiation and maintenance). It investigated which factors individuals with MMD perceived to be important for integrating PA into the treatment of depression in adults. In-depth interviews were carried out with individuals with MMD ($N = 6$), and data were analysed using thematic analysis. Two main theories of social capital that of Bourdieu and Putnam informed the discussion of findings. The initiation and maintenance of PA were linked to individual factors including health (i.e. nature of depression; comorbidities); abilities and tastes; socioeconomic status (e.g. financial position) and positive encouragement. In addition, maintenance emerged as dependent upon the choice, enjoyment, and meaningfulness of PA itself, and, for those who engaged in group PA, on social capital. PA interventions need to be personalised. This goes beyond a simple exercise prescription based on functional ability, but instead takes into account the needs, desires and capabilities of the whole person. The nature of MMD, the wider physical and socio-economic context and the social capital that is available to the individual also need to be harnessed.

KEYWORDS

depression, phenomenology, physical activity, qualitative research, social capital

1 | INTRODUCTION

Depression is the largest contributor to the global burden of non-communicable disease, with an estimated 246 million cases (World Health Organisation, 2020). Indeed, 4.4% of the world's population have a diagnosis of depression at any one time (World Health Organisation, 2017); of these, the majority will have mild-to-moderate depression (MMD; Shim et al., 2011). In a recent UK cohort, 24% reported

current or previous depression (Davis et al., 2018), indicating a high prevalence and demand which healthcare services are failing to meet. Common interventions for MMD, such as psychological therapies, have limited reach: in the UK, three-quarters of those affected do not receive treatment (The Health Foundation, 2020). COVID-19 brings new challenges, including deterioration of mental health (De Quervain et al., 2020). There is, therefore, an urgent need for cost-effective and scalable interventions which can reach a larger number of people.

Physical activity (PA) is defined as "any bodily movement produced by skeletal muscles that requires energy expenditure" (World Health Organization, 2018). It encompasses everyday activities (such as walking, housework, do-it-yourself or gardening), work-related activities and traditional exercise forms such as attending a gym, running, dancing or playing sports or active games (Department of Health, 2011).

The relationship between depression and PA is reciprocal; depression leads to decreased PA levels, and reduced PA levels exacerbate depression (Da Silva et al., 2012; Mammen & Faulkner, 2013; Teychenne et al., 2008).

Physical activity can decrease the risk of depression (Choi et al., 2019, 2020; Schuch et al., 2018), and has been identified as an effective therapy for depression (Brinsley et al., 2020; Schuch et al., 2014). By contrast, inactive individuals have an incidence of depression which is three times higher than the incidence in those who exercise regularly (Weyerer, 1992).

PA may be an effective treatment for depression through multiple mechanisms. For example, PA antidepressant effects have been linked to its ability to: (a) upregulate the anti-inflammatory marker interleukin-10 (Euteneuer et al., 2017); (b) reduce the pro-inflammatory marker interleukin-6 (Lavebratt et al., 2017); and (c) reduce the marker of oxidative stress, serum thiobarbituric acid-reactive substances (Schuch et al., 2014). PA also improves self-esteem (Firth et al., 2016), self-efficacy (Haller et al., 2018) and cognitive functioning (Ashdown-Franks et al., 2020). PA can amplify its antidepressant effects through providing opportunities for social engagement and support (Hallgren et al., 2017).

With regard to dosage, higher levels of PA are associated with lower risk of developing depression (Schuch et al., 2018). The UK's National Institute for Health and Clinical Excellence (NICE) guideline on treating MMD and persistent subthreshold depression (NICE, 2020) recommends that individuals engage in up to three, 45–60 min PA group sessions per week, over 10–14 weeks. With regard to PA type, aerobic (cardio-respiratory), anaerobic (intense PA of short duration, e.g. muscle strengthening) and activities which improve flexibility and co-ordination (e.g. yoga) have all been found to have positive effects on depression (Bennie et al., 2019; Brinsley et al., 2020; NICE, 2020). Interventions delivered by exercise professions have been found to have larger effect on depression (Schuch et al., 2016). NICE highlights the importance of patients' preferences for PA type(s) (NICE, 2020).

Despite being efficacious in the treatment for depression (Morres et al., 2019), it is less well known how to support patients with depression to initiate and sustain PA. This has significant implications for implementation efforts. Exploring the perceptions of individuals with depression on how PA could be implemented into depression management is likely to inform future interventions. Specifically, a greater understanding of what matters most for people with depression will further understanding of how PA can be initiated and sustained in this population. The distinction between PA initiation and maintenance is important here, as the two functions engage different mechanisms and require separate psychological processes and skills (Voils et al., 2014).

What is known about this topic

- Physical activity (PA) is effective in treating and preventing mild-to-moderate depression (MMD).
- The current national guidance highlights the cost-effectiveness of exercise as a component of management of depression.
- Nonetheless, a large population of patients with MMD are currently inactive.

What this paper adds

- To support individuals with MMD into more physically active lifestyles, interventions need to be personalised beyond a prescription that is based on their physical fitness. Instead, a person's wider physical and social context needs to be given appropriate consideration.
- This study suggests that, in relation to PA maintenance, a focus on the individual-level motivational theory and/or biomedical factors does not provide sufficient basis for explaining the PA behaviour of those with depression.
- Capturing social capital perspectives seems to account for a more comprehensive picture of factors that might contribute to PA maintenance.

2 | METHODOLOGY AND METHODS

2.1 | Phenomenology

This study adopted a descriptive phenomenological approach (Husserl, 1982), which has often been applied in studies on depression where the meaning of tacit experience is little explored and requires analysis (Drew, 2004; Matua & der Wal, 2015). Digitally recorded in-depth interviews with adult individuals who have experienced depression were used to elicit their experiences and perceptions of integrating PA into the treatment of depression. The data would offer insights into the relationship between individual engagement and management of depression in adults.

2.2 | Sampling method

Purposive sampling was used to maximise the diversity of the sample (Mason, 1996, 2002). The only limits placed on selection were

the age of participants (≥18 years) and whether they have been diagnosed with depression by a general practitioner. The maximum number of participants (n = 12) was determined by the study protocol, available funding and having a practical sample with which to conduct an in-depth and thorough study (Mason, 2002).

2.3 | Study setting and recruitment

Participants were recruited via local mental health charity organisations in a city in the north of England. Charity managers applied the inclusion criteria to identify eligible individuals, who were given a participant information sheet. If they expressed interest in taking part, their contact details were passed to a member of the research team (KM), who then contacted them to provide more information about the study and answer questions.

Twelve individuals were invited to participate. Each was given at least 5 days to consider taking part. The most common reasons provided by those who declined were lack of time and interest. One person reported being too unwell to participate.

Six participants aged between 38 and 62 were interviewed. Five were women. Two participants were self-employed and working full-time; four were unemployed. All but one participant lived alone.

Two participants were previously referred by a health professional to a PA intervention; others were self-referred or else were directed to group PA by third parties (usually peers). All participants were physically active at the time of the interview.

2.4 | An interview schedule

The interview schedule was based on the aims and objectives of the study. The majority of items on the schedule concerned participants' experiences and perceptions of integrating PA into management of depression. The schedule was piloted on one Patient and Public Representative (SH) and one peer researcher. Prior to testing the schedule was subjected to scrutiny by the ethics review panel. No changes to the schedule were requested.

2.5 | Interviews

In-depth interviews (Boyce & Neale, 2006) were digitally recorded between December 2017 and March 2018. One interview was conducted by telephone and five at university premises. Participants were interviewed by the first author, a researcher with experience in interviewing individuals with mental ill health. Before the interviews commenced, participants were put at ease with general introductions and a brief background to the study (Adams & Cox, 2018). They were also provided with details on confidentiality (Adams & Cox, 2018). Interviews lasted from 65 to 100 min (with an average length of 90 min); all were transcribed verbatim.

2.6 | Data analysis

Interview data were given a thematic analysis (Braun & Clarke, 2006; Merton, 1975) and independently coded by two researchers (KM and PA). Thematic analysis was selected as it is compatible with descriptive phenomenology (Sundler et al., 2019).

The data analysis commenced by KM and PA jointly developing an initial coding framework and code units, which were subsequently used to code all interview transcripts. The initial framework was then refined further through integration as coding progressed and new codes emerged from the data. To establish the credibility of the findings, the reliability of the coding was assessed (Tuckett, 2005), through calculating the percentage of matching coding decision made using the final version of the coding framework. The inter-coder agreement ranged between 83% and 93% with a mean score of 88%. Any discrepancies in judgement between the researchers were resolved through discussion. Reflexivity was maintained throughout the data analysis process (Sundler et al., 2019).

3 | ETHICS

Ethical approval was granted by the Sheffield Hallam University Ethics Committee (ref. 2017-8/HWB-HSC-05). Written informed consent was obtained from participants for the use of evidence from interviews. The ethical principles and practices adhered to were those identified by the U.K. Public and Patient Involvement Advisory Group: NIHR INVOLVE.

4 | FINDINGS

This section examines the participants' views of features important for the integration of PA into the management of depression, including factors important for PA initiation and maintenance. An overview of the key findings is provided in Table 1.

4.1 | The integration of PA into depression management

4.1.1 | Personalisation

Participants stressed the importance of personalising the integration of PA into the management of their depression. Personalisation was characterised as encompassing components related to several factors, as set out below.

Nature of disorder

Narratives indicated that PA initiatives and programmes need careful planning to weave in elements targeting the nature of depression. Participants reported experiencing days when they struggled to get out of bed and engaging in PA would be inconceivable. PA initiatives need to account for the cyclical nature of depression, planning

TABLE 1 Key findings

Theme	Key findings
Nature of disorder	Depression is a long-term condition (typically, recurrent and relapsing) and any attempt to increase and sustain greater levels of physical activity in this population requires long-term support PA initiatives need to account for the cyclical nature of depression, planning for when people are at their lowest point in the cycle. This also implies the need for flexible schemes Cognitive and psychological consequences of depression (e.g. negative thought patterns) can present a significant barrier for individuals with MMD wishing to increase their PA levels
Individual factors	Comorbidities, individual abilities and willingness to initiate PA, and their preferences for PA need to be taken into account It is important that individuals are encouraged to choose physical activities which are enjoyable and meaningful to them Individuals should be given an opportunity to choose between mainstream activities and activities designed specifically for individuals with mental ill health Unobtrusiveness and flexibility in allowing people the opportunity to make their own choices are important attributes of such support
Social factors	Social support plays a significant role in supporting individuals with depression to increase and sustain greater levels of physical activity The importance of a trusted connector in facilitating physical activity initiation and maintenance Feelings of group achievement can reinforce a sense of gain and encourage continuation
Socioeconomic factors	Inadequate financial resources and fees can be a significant barrier to activity participation. Some individuals may therefore require other types of support, such as help to find a job, before physical activity can be introduced There is critical need for a more holistic, whole-person approach, which takes account of depression, comorbidities, and at the same time looks at the social context in which people live and their community-level socioeconomic status The importance of multiorganisational and multidisciplinary input

for when people with MMD are at their lowest point in the cycle. All participants thought that an essential component of intervention was being offered PA at the right time:

> …and I know for me personally, if someone said to me when I am very low physically, mentally, and said, oh you can get down to the gym, you know, I would have told them where to go
>
> (Participant 2, Female, Age 45).

The narratives highlighted the challenge presented by the nature of depression as a cyclical long-term condition with varying symptoms, e.g. some people feel stuck and do not eat, whereas others feel constantly anxious; many withdraw from people and activities:

> The main thing when somebody is depressed is to withdraw. The first trigger is, I won't go, I won't meet with my friends, I will cancel that appointment, and to withdraw from everything. And even if you know that this will make you feel better, you keep postponing it, you are not doing it
>
> (Participant 5, Male, Age 62).

Such responses reveal negative thought patterns linked to withdrawal, with some participants reporting significant hurdles to beginning PA.

Individual factors – Health, abilities, tastes and PA preferences

Participants stressed the importance of taking into account comorbid mental and physical health conditions associated with depression, which could limit individuals' capability:

> Quite often people have a dual diagnosis of mental and physical illness, it's not just one or the other, there are multiple things
>
> (Participant 3, Female, Age 38).

Individual abilities and willingness to initiate PA were linked to setting realistic and accessible goals. The narratives provided evidence that effective PA encouragement, including professional advice and referral mechanisms, should be flexible to enable people to find their own starting point:

> I think helping people change small things would be more helpful than asking them to go to the gym three times a week…
>
> (Participant 3, Female, Age 38).

Participants expressed activity preferences such as walking, swimming or yoga:

> There might be other activities. Things like yoga, mindful walking, which aren't traditionally seen as exercise… Like Tai Chi, for example… it isn't cardiovascular, but it's about movement and about mindfulness…
>
> (Participant 4, Female, Age 42).

Another participant strongly dismissed walking groups as a personal option; implying that initial uptake of PA may hinge directly on prior (perhaps stereotypical) perceptions of the appropriateness of various forms of PA:

> I don't know whether there are things like that [walking groups] where I live, there probably are, but I see them as for older people, churchgoers or ramblers
>
> (Participant 4, Female, Age 42).

Other preferences for participation in PA could be grouped as *mainstream activities* and activities *designed specifically for individuals with mental ill health*. Participants who preferred mainstream activities appeared to require support to overcome barriers to initiating or re-establishing physical activities but did not seem to require the support of healthcare practitioners. They did not want others to know that they had mental health problems, which was attributable to fear of being stigmatised. They wanted to feel that they are engaging in an activity that is 'normal/typical' for their peers rather than being part of formal agencies.

The nature of some PA, such as exercising in the gym, was regarded as a barrier:

> It's just my opinion, but I feel gyms are quite anti-social. It's like you've got to go on treadmill for ten minutes, then you've got to do that for ten minutes. You know, if you play tennis, even if you're doing it in an inside environment, you're with other people and you've got social aspects, it boosts your mood as well
>
> (Participant 4, Female, Age 42).

Two participants were concerned about their body image and reported feeling too self-conscious to go to the gym. One participant worried that she would stand out because of a lack of stamina. As a whole, participants felt that it was imperative that people are encouraged to choose activities that are enjoyable and meaningful to them.

Social factors

Having a trusted connector (a peer, community support worker, healthcare practitioner or others) to support someone to be more active was identified as a desirable and helpful factor in relation to PA initiation and maintenance:

> ...helping people to do that exercise, very slowly, gradually working through it
>
> (Participant 4, Female, Age 42).

Unobtrusiveness and flexibility in allowing people the opportunity to make their own PA choices were important attributes of such support:

> There is a balance between a bit of support and a bullying text
>
> (Participant 5, Male, Age 62).

Attempts to facilitate an increase in and sustainment of PA in people with MMD were identified as requiring long-term support; with change towards increasing PA levels being gradual and slow, with inevitable setbacks:

> For the majority of people, it's going to be a very staggered, with a few blips, you know, the ladder thing, coming down, going up again and everything else and having to work with that
>
> (Participant 3, Female, Age 38).

Given these challenges to starting PA for those with MMD, a positive encouragement to boost self-efficacy (the belief that one can perform the behaviour) was thought to play a particularly important role in creating the atmosphere, motivation and environment in which to sustain engagement:

> A few kind words of encouragement, even when you are underperforming, can make a difference... the opposite is also true
>
> (Participant 5, Male, Age 62).

Participants discussed the reasons why they might find PA meaningful and worthwhile; in some cases, it might be the sociability of the activity, and the possibility of finding new friends and networks:

> ...it's not just about getting your heart rate going and its benefits... you might meet some people you've never met before...
>
> (Participant 3, Female, Age 38).

> I was isolated... but you can build relationships, even if it's only 'see you next week' and you look forward to seeing them next week, and you get suggestions about going to a gardening group or another group... and slowly... you aren't isolated
>
> (Participant 6, Female, 43).

The narratives suggested some fluidity in terms of preferences for group or lone activities, indicating that the two should not be seen as a binary choice but depended on individuals' moods and preferences on a given day:

> I may want to go and join a class, or I may go on my own, it depends on my mood
>
> (Participant 5, Male, Age 62).

For individuals who reported that PA helped them overcome isolation, improved their social interactions and helped them bond with others, the positive effects of PA seemed to evolve organically through spending time together and sharing experiences. Despite the major initial barrier concerning fear of social interaction, participants in group-based PA found emotional connections and a strong sense of duty and responsibility towards others were crucial to the maintenance of their engagement:

> I always felt uncomfortable as I don't mix easily. I met the woman who did bowling and… it has been my saviour. I can mix with people without talking to them, not because I am antisocial, but I play the game and I am concentrated and I do not think about my troubles …Sometimes I enjoy bowling and sometimes I do not, but I go… If I would do it just for me, I could easily not do it, but if I'm doing it for the team, I would be there, because I do not want to let them down…
>
> (Participant 1, Female, Age 48).

Additionally, feelings of group achievement seemed to reinforce a sense of gain and encourage continuation.

Participants discussed how PA might help to combat depression through links to other activities and outcomes, such as providing practical support for conservation work or gardening, which in addition to providing physical enjoyment and spending time with others offers skill-building experiences:

> …To say actually, to go down into, I don't know the woods etc. and do some conservation work that's chopping down bushes or whatever, it is exercise. That's physical activity. But at the same time, it is different. I'm going down to do my eco-therapy, I am doing stuff, I am socialising, I am with people
>
> (Participant 3, Female, Age 38).

Activities such as hobbies done in groups, including reading or a range of craft activities such as knitting, were also identified as useful for those who might not be able because of poor physical health to engage in more physically demanding modes of PA. These activities seem low in physical demand but require individuals to get out of the house. Additionally, they involve social bonding and are associated with the psychological benefits of interacting with others:

> For some people where they are just being able to get out, get on the bus, go to somewhere and maybe do an activity, I don't know, maybe a craft for instance or something like that…
>
> (Participant 3, Female, Age 38).

Socioeconomic and other factors

Inadequate financial resources and fees were identified as a significant barrier to activity participation:

> We can't sort of say well go there but you've got to pay…
>
> (Participant 2, Female, Age 45).

Financial considerations and fees also featured among reasons for not joining the gym. Two participants thought that purchasing a gym membership would likely increase their general anxiety, and they may experience prevarication due to anxiety at the point of leaving the house to go to the gym:

> I'm physically active, but I don't go to gyms and I can't sort of commit to big things like that. That would be just me, I'd feel too much pressure, or I'd probably feel anxious about I've got a gym membership, so I feel under pressure that I need to go to the gym
>
> (Participant 2, Female, Age 45).

Sometimes participants' place of residence limited access and affected the affordability of PA opportunities:

> Accessibility is a huge issue… It's like a postcode lottery… what you get… some people will think oh yeah, I've got these opportunities… And other people will go well, I've got nothing. I'm isolated because I'm stuck over here… accessibility is a massive issue
>
> (Participant 3, Female, Age 38).

The participants felt, therefore, that while for some it might be both appropriate and important to introduce PA early on in the treatment, others might benefit from different types of support (e.g. help with finding a job) before PA could be introduced. The need to embrace a more holistic, whole-person approach, which takes account of depression, comorbidities, and at the same time looks at the social context in which people live and their community-level socioeconomic status (SES), was apparent in the narratives. The participants recognised that providing such support requires a whole system with multiorganisational and multidisciplinary input:

> Chucking the boxes away, just thinking very holistically about where people are. Thinking about what is needed for the individual and really working on that, but there has to be multilayers of activity, support and organisations that are actually doing this stuff
>
> (Participant 3, Female, Age 38).

5 | DISCUSSION

Physical activity has been shown to both reduce the risk of MMD and act as an efficacious treatment (NICE, 2020). The implementation of PA as an adherent treatment is not well understood. Exploring PA with individuals who have depression is likely to provide valuable insights to help shape future interventions. This qualitative enquiry elicited a number of factors that might be useful for the integration of PA into the routine treatment of depression. Data identified predisposing factors for the initiation and maintenance of PA among individuals with depression with both personal and community factors being identified as important. Personal factors were related to health (e.g. the nature of depression (a long-term condition typically with a remitting and relapsing course, comorbidities Vancampfort

et al., 2016; Way et al., 2018), abilities and life circumstances (e.g. SES; Happell et al.., 2012; Machaczek et al., 2018); tastes and social factors, including social capital.

Data reported here concur with previous findings that MMD can be hypothesised to interfere with both motivation and volition (i.e. the ability to turn motivation into action; Krämer, Helmes, & Bengel, 2014; Krämer, Helmes, Seelig, et al., 2014). This will be particularly evident when individuals are at the lower point in the depression cycle, which can easily render interventions unsuccessful. Offering PA at the right time, i.e. before they start experiencing physical symptoms of depression, will therefore be an essential component of interventions (Machaczek et al., 2018). Also, for some individuals, it might be more appropriate and important to introduce PA early on in the treatment whereas others may require other types of support (e.g. psycho-social interventions), to help them overcome negative thought patterns that might prevent them from becoming more active. For example, strategies such as situational analysis, goal setting, self-monitoring, homework activities and supportive follow-up can enhance PA participation (Otto et al., 2007). In one study, a CBT-based intervention reported significant increases in the participants' self-efficacy for increasing PA at a follow-up compared to the control group (Piette et al., 2011).

To account for the long-term and cyclical nature of the condition and comorbidities, flexible, less structured interventions without a definite end-point are likely to: (a) be more appealing to this patient group and (b) facilitate PA maintenance (Crone et al., 2005; Grant, 2000). For example, individuals may need to be able to drop in and out of PA interventions should their MMD symptoms fluctuate, and be encouraged to return (Crone et al., 2005, 2008; Grant, 2000). Inflexibility of schemes has previously been identified as a barrier to PA initiation and adherence among people with MMD (Crone et al., 2005; Grant, 2000). For instance, exercise referral schemes which include a motivational component, but are largely generally generic schemes for patients with a range of long-term conditions, have proven specifically ineffectual in people with MMD (Crone et al., 2008). Those who engaged in the schemes (4% of all referrals) did experience short-term health benefits (Crone et al., 2008), but uptake and sustained participation are generally low (Duda et al., 2014; Littlecott et al., 2014; Murphy et al., 2010). Further reasons for poor uptake of exercise referral schemes included difficulties in access, financial constraints (Crone, 2007), lack of social network (Crone et al., 2008) and a lack of acceptability.

Our findings add to the previous evidence review (Machaczek et al., 2018) that community and socioeconomic factors implicated in issues about access, logistics, social/community networks, community type, costs and the use of PA as an intervention for MMD require identifying intervention components or models that avoid or reverse those factors. This implies that PA interventions should embrace the whole person, a holistic approach to individuals' health and well-being. This approach could include connecting people to statutory services for practical support (Allmark & Machaczek, 2015; NHS England, 2020), and to a wide range of activities and community groups. The holistic approach, such as that seen in social prescribing (Friedli et al., 2008; NHS England, 2020), would also act as a vehicle for social engagement and opportunities that may encourage people to get out in the community (Chatterjee et al., 2018). It would also facilitate the selection of activities that are meaningful to individuals, enhancing autonomous motivation (i.e. consistent with intrinsic goals and outcomes) and increasing the likelihood of PA initiation and maintenance. Indeed, people with affective disorders (e.g. major depressive disorder) have been shown to be more physically active when they have higher levels of autonomous motivation (Vancampfort et al., 2015).

While everyone on their behaviour change journey will experience lapses and setbacks, how they are experienced, and the decisions about participation in PA made in consequence, might be different for those with MMD. The exacerbated feelings of guilt, worthlessness and helplessness that often accompany depression can lead to disengagement from goals (Nekanda-Trepka & Bishop, 1983) and impede maintenance. When lapses occur, individuals with MMD are more likely to be affected by *abstinence violation effect* where they dramatise the event (Marlatt et al., 1995) and become more depressed.

Weaker perceptions of control and high levels of guilt due to lapses in non-depressed exercisers were identified in a previous study as being linked to decreased PA during follow-up (Stetson et al., 2005). Interventions including approaches to enhance individuals' recovery self-efficacy (returning to PA after a setback; Marlatt et al., 1995; Schwarzer, 2008), such as action planning or reinforcing effort towards behaviour (Williams & French, 2011), might improve adherence. Furthermore, it is key to set realistic expectations so that disappointment with performance and/or outcomes does not impede maintenance (Norman & Conner, 2015; Sears & Stanton, 2001).

Heightened expectations can be detrimental to the maintenance of health behaviour (Rothman, 2005). Additionally, the perceived satisfaction from PA participation will play a role in creating positive feedback loops, essential in activity maintenance (Rothman, 2005). Participants here highlighted the importance of positive encouragement on sustained increases in PA and the provision of social networks and support, reinforcing findings from previous research (Crone et al., 2005; Jeanes et al., 2019).

The availability of a trusted connector was identified as desirable and helpful in relation to PA initiation and maintenance. This finding is consistent with previous studies, indicating that the availability of social supportive relationships during an exercise intervention has a significant effect on maintenance of PA, as well as on reducing the severity of a patient's symptoms (Hallgren et al., 2017). Other research has reported that, for individuals with severe mental illness (SMI), and those with low self-esteem and confidence, in particular, social support from others with SMI facilities the formation of feelings of togetherness that reinforces shared identities (Crone, 2007; Quirk et al., 2020; Soundy et al., 2012, 2015), having a positive effect on participation. There is, however, the possibility of reverse causality, with PA being a normalising experience through providing an environment and opportunities for socialisation (Mourão et al., 2019; Zurawik et al., 2019).

Several theories in psychology might help to provide insight into the findings reported here. The five-factors model of personality

attributes an individual's adherence to an activity, to consciousness (Courneya & Hellsten, 1998; Hagger et al., 2010; Rhodes & Smith, 2006; i.e. a sense of responsibility towards others), with 'stable' contexts such as those provided by a structured group (e.g. bowling club) leading to PA becoming habitual (Norman & Conner, 2015). Social cognitive theory, on the other hand, sees the effect of social support as being enacted directly or indirectly via changes in self-efficacy (Norman & Conner, 2015). Positive feedback on performance can boost self-efficacy and, hence, activity adherence. Self-efficacy has been identified as a mediator between PA and depression scores (Pickett et al., 2012), and a predictor of both initiation and maintenance of health behaviours (Norman & Conner, 2015). *Action self-efficacy* being important for intentions and initiation (Norman & Conner, 2015) and *recovery self-efficacy* playing a key role in behaviour maintenance (Marlatt et al., 1995; Schwarzer, 1992). The theory of interpersonal behaviour (Triandis, 1977, 1980) contributes the role of social factors to individuals' intentions through the internalisation of a group culture and interpersonal contracts made with group members. Social support might be a component of a bigger supportive environment, which facilitates PA maintenance (Orleans, 2005). While all of the above theories offer some explanation of the behaviour, the social capital perspective provides a much more comprehensive picture of contributors to maintenance.

'Social Capital' (SC) has been defined as "features of social organisations, such as networks, norms, and trust, that facilitate action and co-operation for mutual benefit" (Orleans, 2005, p. 35). This includes a structural component (the form of social networks) and a cognitive component (the quality of social interactions within the network; Bourdieu, 1986; Foxton & Jones, 2011; Harper, 2002; Stafford et al., 2008). The cognitive component of social capital includes people's feelings of attachment to an area, and, inter alia, their ability to call on or give practical help to others as well as develop and maintain social relationships with them (Friedrich & Mason, 2017; Lamont et al., 2017). All of those factors were identified in the data here as important, either as 'unintended consequences' of PA or as the reason for its maintenance.

Social Capital' is further subdivided into bonding, bridging and linking. Family ties are a good example of the former – these are ties between similar types of people. Bonding social capital can reinforce health promotion initiatives and programmes (Kawachi & Berkman, 2000). For example, active commuting and walking in the neighbourhood is encouraged if neighbours engage in such activities (Kawachi & Berkman, 2000). Bonding has also been found to facilitate activity initiation (Gilbertson & Batty, 2011).

Similarly, as illustrated here and in previous studies, bonding capital, through evoking a sense of attachment, obligation and unwillingness to let others down by not showing up for PA, can enhance activity maintenance (Grant, Machaczek, et al., 2017; Grant, Pollard, et al., 2017). For those who participated in group PA, meeting and bonding with others seemed to contribute to a sustainable increase in PA.

Bridging ties are between people of different types in a wider community, e.g. by ethnicity, class or health condition. They tend to be more inclusive and encompass people across social groups (Gittell & Vidal, 1998). Bridging SC has the potential, therefore, to sustain participation in mainstream health interventions, e.g. bowling in a community centre. Further examples of how PA can contribute to bridging capital also emerged in this study. For example, our findings illustrated how PA could contribute to enhancing wider civic virtue through, for example, PA participants' role in helping another community organisation (e.g. a bowling or ecotherapy group) to increase recruitment, activities as well as maintaining programmes (Bruggen et al., 2020; Clatworthy et al., 2013; Soga et al., 2016).

Linking social capital, which can be conceptualised as networks across power differentiated individuals (Szreter & Woolcock, 2004), can enhance respondents' receptiveness to government messages about healthy lifestyle. The present study, therefore, reiterates that PA can contribute to building social capital in communities (Gilbertson & Batty, 2011; Grant, Machaczek, et al., 2017; Grant, Pollard, et al., 2017). PA offers for individuals with MMD need to be personalised in a way that takes that person's wider physical and social context into consideration. This includes making use of whatever social capital is available to the individual.

The most appropriate approach to support PA initiation and maintenance among individuals with MMD is therefore likely to span across the public and clinical models, involving both, healthcare (where the initial encouragement to initiate PA could be made) and non-healthcare organisations, such as local authorities and third sector organisations (which provide PA opportunities). Such an approach is in line with existing policy initiatives, including the NHS Long Term Plan (NHS England, 2019), which identifies personalised, holistic provision as a priority for the NHS, and Five Year Forward View (NHS England, 2014) for Mental Health, envisaging a whole systems, whole person approaches which bring together the NHS and community organisations to provide improved care for patients.

6 | STRENGTHS AND LIMITATIONS

While this was a small study in terms of the number of participants, a major strength is the richness of the data yielded by the in-depth interviews, which produced a wealth of relevant insights from the perspective of people with direct experience of the impact of depression but also of factors that had made a difference to their own activity levels.

The findings of this study should be considered in light of the following limitations. Although we placed importance on engaging people from different backgrounds, time and financial limitations meant that there is a potential selection bias in the recruitment of our sample. For example, we have no data from individuals outside the White British group. Future research needs to explore if the themes identified here are consistent across a greater diversity of population, including ethnic minorities and socioeconomic status.

This study was conducted before COVID-19 and it would not be possible to have a clear picture of the rapidly changing socio-economic circumstances during and post-crisis. It is likely that factors such as fear of infection, social distancing measures and the accessibilities of

parks and community amenities (e.g. sport facilities), will significantly affect potential for group activities. Our next steps are therefore to translate our findings into the current public health context.

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DATA AVAILABILITY STATEMENT

The datasets generated and analysed during the current study are not publicly available due to confidentiality agreements with the participants.

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