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An Assessment of the Efficacy of an Online Pain Management Programme During the Covid-19 Pandemic

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ABSTRACT

Background: Following the outbreak of the Covid-19 pandemic and associated social distancing requirements, Pain Services were no longer able to deliver face-to-face Pain Management Programmes (PMP). As an alternative, the Bury Integrated Pain Service developed an interactive, online programme, delivered via Microsoft Teams videoconferencing technology. However, the efficacy of such programmes is unclear. The aim of this project was to assess whether comparable results were observed with online PMPs as with face-to-face PMPs.

Methods: A non-inferiority study comparing patients attending an online PMP to a historical cohort of patients attending face-to-face PMPs. Analyses of variance were performed to assess between group differences and chi squared tests to compare the proportion of patients making clinically meaningful changes in pain, musculoskeletal health, anxiety, depression and self-efficacy.

Results: 24% of patients ($n = 9$) deemed suitable for the online PMP were unable to participate due to technological difficulties. This resulted in 28 people attending the online PMP. Greater mean reductions in anxiety (GAD-7 mean difference = 1.9; $p < 0.05$) and depression (PHQ-9 mean difference 3.3; $p < 0.05$) were observed with face-to-face PMP and a greater proportion of patients made clinically meaningful improvements in musculoskeletal health (face-to-face = 13; online = 5), anxiety (face-to-face = 7; online = 1), and depression (face-to-face = 11; online = 2).

Conclusions: Some patients appear to obtain significant benefit from online PMPs, but this appeared to be to a lesser extent than face-to-face PMPs. It is possible that factors related to the experience of the pandemic influenced these results. However, online PMPs appear to show some promise and further research is warranted to explore the value of online PMPs.

1 | Introduction

Chronic pain is a significant healthcare problem within the United Kingdom (UK), with prevalence estimated at up to 50% of the population (Mills, Nicolson, and Smith 2019). Up to 14.3% of those living with chronic pain are thought to be moderately to severely disabled by their symptoms. Current practice guidelines highlight the importance of recognising the multifactorial nature of pain and the identification of biopsychosocial barriers to rehabilitation (National Institute for Health and Care Excellence 2021). For example, chronic pain may contribute to depression, which in turn may exacerbate pain symptoms. Moreover, other factors such as elevated levels of pain-related fear and catastrophizing and low-self-efficacy beliefs have

been shown to contribute to disability in patients with chronic pain (Thompson, Antcliff, and Woby 2022). It has been suggested that addressing these factors may reduce barriers to rehabilitation and contribute to improvements in physical functioning and health (Thompson, Antcliff, and Woby 2022).

Patients with psychosocial risk factors are frequently treated in pain management programmes (PMPs). PMPs are multidisciplinary programmes which aim to optimise patients' management of their symptoms through a combination of interactive educational sessions, psychological therapies and graded exercise (Kamper et al. 2015). The group element of treatment has also been hypothesised to contribute to the efficacy of treatment through a combination of vicarious learning experiences, social interactions and peer-support (Scriven, Doherty, and Ward 2019).

In March 2020, widespread social distancing requirements were implemented in the UK following the pandemic outbreak of Covid-19. Consequently, the delivery of group-based PMPs was no longer feasible. As an alternative, online PMPs are increasingly used within pain services. Whilst some previous studies have supported the use of online PMPs, these studies have tended to explore self-guided PMPs with minimal supervision or clinical input (Dear et al. 2017; Hadjistavropoulos et al. 2018; Pimm et al. 2020). Such programmes may be appropriate for some patients. However, they may not be suitable for patients with more complex needs who require greater support and guidance to improve their pain management. Indeed, the current research team initially developed and implemented a self-directed PMP. Verbal and survey feedback was sought from both patients and clinicians following completion of the self-directed programme. Patients reported that the lack of feedback and support meant that self-directed treatment did not meet their needs. Similarly, clinicians felt that the lack of interactive content and tailored treatment meant that clinical outcomes were sub-optimal.

In response to the pandemic, we developed an interactive online PMP delivered via videoconferencing which included the same content as the usual face-to-face PMP (described in more detail below). It was not possible to perform a randomised controlled trial to assess the efficacy of this programme since no face-to-face PMP comparison group could be offered. However, data were routinely collected for the face-to-face PMP before and after treatment as part of ongoing service evaluation. Consequently, historical data existed for clinical outcomes for the face-to-face PMP, which enabled comparison between the usual programme and the online programme. The importance of publishing service evaluations comparing the efficacy of online versus face-to-face interventions was recently highlighted in a recent rapid review of the efficacy of PMPs via video conferencing (Walumbe, Belton, and Denneny 2020). The authors also highlighted the current lack of studies reporting clinical outcomes for such programmes and the importance of learning lessons from these programmes to inform future research agendas in this area.

Furthermore, establishing whether online PMPs are equally as efficacious as face-to-face PMPs may have important implications, even though social distancing restrictions related to Covid-19 have been lifted. Specifically, it is feasible that some patients may prefer to receive their treatment in an online format. For example, online treatment may be more convenient, reduce the need for travel and time off work, or allow patients who would struggle to engage with treatment to participate in the programme (Walumbe, Belton, and Denneny 2020; Willcocks et al. 2023). Moreover, online PMPs may also be appropriate for rural areas with low population density where pain centres cover large geographical areas. This evaluation therefore aimed to assess whether an interactive, online PMP was as effective as a face-to face PMP in improving pain, musculoskeletal health, anxiety, depression and self-efficacy beliefs.

2 | Methods

2.1 | Design

This evaluation was a non-inferiority assessment to establish whether online PMPs were comparable to face-to-face PMPs. Historical data regarding face-to-face PMPs were collected from the participating pain service's evaluation database. Clinical data from all patients referred to the participating pain service were routinely collected prior to commencing treatment and again on completion of treatment. Data were logged to an anonymised outcome database alongside the type of treatment received. This allowed the identification of patients who had previously attended face-to-face PMPs. For this evaluation, data were collected for all patients taking part in the online PMP. A comparison group of patients who took part in the face-to-face PMP prior to the introduction of social distancing measures was also identified. Analyses were performed to assess whether differences existed in mean changes in musculoskeletal health, pain, depression, anxiety and self-efficacy. Additionally, analyses were performed to assess whether differences existed in the number of patients making Minimally Clinically Important Changes (MCIC) in the above measures.

2.2 | Participants

Participants were those patients who were referred to the Bury Integrated Pain Service (UK) and who were deemed to be suitable for treatment in a PMP. Patients with any musculoskeletal or non-musculoskeletal pain condition were eligible to participate (e.g., low back pain or fibromyalgia) as long as all appropriate investigations had been completed and serious underlying causes for pain had been excluded (e.g., cancer, infection). All patients referred to the Bury Integrated Pain Service after the introduction of social distancing measures (March 2020 to January 2022) received only virtual treatment. All patients who were offered treatment in the online PMP were included in this evaluation. The face-to-face comparison group was formed by taking a consecutive sample of the most recent patients who were referred to the PMP prior to the introduction of social distancing measures (August 2019 to February 2020). An equal number of patients attending face-to-face PMPs was recruited as the final number of patients attending the online PMPs to ensure fair comparison.

2.3 | Data Collection Procedure

Prior to the Covid-19 pandemic, outcome data were routinely collected in person on the day of initial assessment and the day of completion of the PMP using a self-report paper questionnaire. Following social distancing requirements, data were collected at the same pre- and post-treatment time points via online self-reporting using the Microsoft Forms online application. Identical survey data were collected online as per the paper questionnaire, and the questions were ordered and formatted in the same manner. No personally identifiable data was included on the online form, with the outcome data being linked to the patient via the use of a unique code, which was also recorded on the patient notes. The online data were then transferred to the patient's notes and the online data were permanently deleted.

Basic demographic data (age, sex, pain duration), type of treatment received (online or face-to-face PMP), number of sessions attended and whether treatment was completed were entered into a service evaluation database on completion of treatment. No personal identifiable data, such as name, date of birth, or NHS number were recorded on the database, meaning that it was not possible to link outcome data to individual patients.

3 | Measures

3.1 | Musculoskeletal Health

Musculoskeletal health was measured using the Musculoskeletal Health Questionnaire (MSK-HQ). The MSK-HQ is a 14-item measure which assesses the impact of health conditions on levels of pain, functional ability, mental health, sleep and quality of life. Scores range between 0 and 56, with lower scores representing worse health. MSK-HQ demonstrates excellent test–retest reliability and strong convergent validity (Hill et al. 2016). A MCIC in MSK-HQ is defined as a 5.5-point increase in baseline score. However, since it is not possible for individual patients to make half point improvements, when calculating individual changes in MCIC, a criterion of a 6-point change must be applied to classify whether an individual made a MCIC or not (Scott et al. 2020).

3.2 | Pain

Pain intensity was measured using two eleven-point pain numeric rating scales (PNRS) (Jensen, Turner, and Romano 1994). The first PNRS measured average pain over the preceding 2 weeks and the second measured worst pain intensity over the same period. The scales were anchored at 0 'no pain' and 10 'worst possible pain'. The 11-point NRS is frequently used and has been found to have ease of completion, responsiveness and sensitivity to changes in symptoms (Ferreira-Valente, Pais-Ribeiro, and Jensen 2011). A two-point reduction in NRS score is considered to represent a MCIC in pain intensity (Kovacs et al. 2008).

3.3 | Depression

Depression was measured using the Patient Health Questionnaire (PHQ-9). PHQ-9 contains nine items that screen for and measure the severity of depression in the clinical setting. Each item is rated on a 4-point Likert scale (0–3) with a 2-week recall period. Total scores of 1–4 represent no depression, 5–9 mild depression, 10–14 moderate depression and 15–19 severe depression (Kroenke, Spitzer, and Williams 2001). PHQ-9 has demonstrated good internal consistency (Cronbach's alpha = 0.86–0.89), test–retest reliability (0.84–0.95) and construct validity against other measures of depression (Smarr and Keefer 2011; Cameron et al. 2008). A 5-point reduction in PHQ-9 score is thought to represent a significant reduction in depression (Löwe et al. 2004).

3.4 | Anxiety

Anxiety was measured using the Generalised Anxiety Disorder Assessment (GAD-7). The GAD-7 contains seven items that screen for and measure the severity of anxiety in a clinical setting. Items are rated on a 4-point Likert scale (0–3) over a 2-week recall period. Total scores of 0–5 represent mild anxiety, 6–10 moderate anxiety, 11–15 severe anxiety (Spitzer et al. 2006). GAD-7 demonstrates good reliability (Cronbach's alpha = 0.89–0.92), test–retest reliability (Intra-class correlation = 0.83) and construct validity against other measures of anxiety (Löwe et al. 2008; Toussaint et al. 2020). A 4-point reduction in GAD-7 score is thought to represent a significant reduction in anxiety (Nicholas 2007).

3.5 | Self-Efficacy

Self-efficacy was measured using the Pain Self-Efficacy Questionnaire (PSEQ). PSEQ assesses a person's confidence in their ability to perform activities despite their pain. Each of the 10 items is rated on a scale from 0 to 6, where 0 represents not at all confident and 6 represents completely confident. Scores greater than 40 are considered to represent high levels of self-efficacy and scores under 16 low self-efficacy (Miles et al. 2011). The PSEQ has been found to have high internal consistency (Cronbach's alpha = 0.92), test–retest reliability (r = 0.73, $p < 0.001$) and construct validity (Miles et al. 2011; Chiarotto et al. 2016). A 6-point change is thought to represent a significant change in self-efficacy (Chiarotto et al. 2016).

4 | Interventions

4.1 | Face-to-Face Pain Management Programme

Prior to the Covid-19 pandemic, the face-to-face PMP was delivered in small groups of 8–12 patients. It was delivered on six consecutive weeks, with each session lasting 3.5 h. The programme was delivered jointly by a specialist pain physiotherapist and senior psychological wellbeing practitioner. The programme was based around cognitive behavioural principles, including traditional CBT approaches and third wave therapies

such as Acceptance and Commitment Therapy and Mindfulness Based Interventions (Hayes and Hofman 2021). The programme aimed to facilitate patients to recognise the links between pain and function and their thoughts, beliefs and behaviours. Each session covered a different topic, such as activity pacing, understanding pain neurophysiology, the relationship between mood and pain, sleep and flare-up management. Psychological techniques such as mindfulness and relaxation are taught to support patients' self-management. In addition, each week the patients completed a supervised, structured exercise programme, which they were asked to continue at home. Finally, patients set valued goals to work towards over the following week. These goals were then reviewed in the next session and supportive problem solving was employed to help participants identify and overcome barriers to completing their goals.

4.2 | Online Pain Management Programme

During the Covid-19 pandemic/social distancing, the supported online PMP was delivered to small groups of up to 12 participants. It was delivered by a physiotherapist and Senior Psychological Wellbeing Practitioner entirely virtually using the Microsoft Teams teleconferencing application. The same content was covered as per the face-to-face PMP, with Microsoft PowerPoint presentations being utilised in lieu of the usual interactive written presentations. Patients were able to interact with clinicians either through the 'raise hand' function or by submitting written questions via the Teams messaging function. Messages were monitored by the clinician not currently delivering the interactive presentation and were fed into the discussion. Patients continued to exercise as part of the programme. A pre-recorded video of the exercises was played, and clinicians monitored patients' performance and safety via a webcam. Finally, patients set and reviewed goals as per the usual programme.

4.3 | Sample Size

The required sample size was calculated using the non-inferiority criteria suggested by Julious and colleagues (Julious 2004). According to this methodology, criteria must be established as to the degree of difference which would constitute a treatment being classified as inferior to another. For the purpose of the sample size calculation in this study, an MCIC difference of 6 points on the MSK-HQ was used since the MSK-HQ was the main outcome measure in our PMPs (Scott et al. 2020).

All available outcome data from the face-to-face PMP ($n = 97$) were used to calculate the standard deviation of the change in musculoskeletal health (SD = 8.79). On this basis, a minimum sample size of 27 patients per group was required to assess the non-inferiority of the online programme, assuming a power level of 80% and a significance level of 5% (Sealed Envelope 2023).

5 | Statistics

5.1 | Preliminary Examination of the Data

Analyses were performed to establish whether significant differences existed between the two groups with respect to baseline scores on the clinical outcome measures and demographics. For continuous data *t*-tests were performed, and for interval data chi-squared tests were employed (Field 2005).

5.2 | Primary Analyses

Analysis was performed to establish whether significant differences existed in mean changes in musculoskeletal health scores. Shapiro–Wilk tests were performed to establish whether musculoskeletal health data were normally distributed. If results were normally distributed Analysis of Variance (ANOVA) was performed to establish whether significant differences existed between the face-to-face and online programmes. If data were not normally distributed, Kruskal–Wallis tests would be performed (Field 2005).

5.3 | Secondary Analyses

Analyses were also performed to assess between group differences in mean change in average and worst pain, anxiety, depression and self-efficacy beliefs (post-treatment minus pre-treatment scores). The analyses were performed in the same manner as the primary analysis.

Secondary analyses were also performed to establish the percentage of patients making an MCIC in musculoskeletal health, average pain, worst pain, anxiety, depression and self-efficacy beliefs. Dummy coding was used to document whether individual patients made an MCIC for each of the outcome measures. Chi-squared tests were then performed to establish whether the proportion of patients making an MCIC on the outcome measures differed between those treated in the face-to-face programme and those completing the online programme.

Data were also collected from the service evaluation database to establish the number of patients who completed treatment in the face-to-face and online PMPs. Chi-squared tests were performed to establish whether treatment completion rates differed significantly between the groups.

5.4 | Missing Data

Intention to treat analyses were performed. In instances where patients did not provide data, it was assumed that no improvement was made, and the last known value was carried forward. In instances where two or fewer data points were missing for individual items on a questionnaire, the average score for the remaining items on the questionnaire was inputted in its place. In instances where it was not possible to calculate

whether an MCIC was made, it was assumed that no clinically important change occurred.

6 | Results

6.1 | Attendance

Thirty-seven patients were eligible for treatment in the online programme. Nine patients (24%) declined to engage with the programme due to either lack of appropriate IT equipment or lack of IT skills and confidence to engage with treatment. Twenty-eight patients (76%) went on to engage with the online PMP; however, data were only available for 26 patients. Clinical analyses were therefore performed on these 26 participants and the last 28 participants to complete the face-to-face programme. Table 1 shows demographic characteristics and baseline clinical outcomes. No significant differences existed between the groups in any baseline demographic and/or symptom data. There were no significant differences in the proportion of patients completing the programme between the two groups (online 54%; face-to-face 64%), although it should be noted that this analysis does not include the patients who were unable to engage with the programme due to IT issues. When these patients were included, 46% of patients identified as being suitable for treatment in the online PMP completed treatment, compared to 64% in the face-to-face programme. However, this difference remained statistically non-significant ($p = 0.14$).

The Shapiro–Wilk test revealed that musculoskeletal health data were normally distributed and therefore ANOVA was performed. Table 2 shows pre-post changes in outcome measures and significant differences between the groups. Significantly larger mean changes in anxiety (GAD-7 mean difference = 1.9; $p < 0.05$) and depression (PHQ-9 mean difference 3.3; $p < 0.05$) were observed in the face-to-face PMPs compared with the online PMPs.

Analyses of the proportion of patients making a MCIC in outcome (Table 3) revealed that significantly more patients made MCIC changes in musculoskeletal health ($n = 13$ vs. $n = 5$), anxiety ($n = 7$ vs. $n = 1$) and depression ($n = 11$ vs. $n = 2$) in the face-to-face PMPs ($p < 0.05$) compared with the online PMPs.

7 | Discussion

This study aimed to establish whether treatment in online PMPs was comparable to treatment in a face-to-face equivalent. A notable finding was that 24% of patients who were eligible for treatment in the online PMP could not access this form of treatment, even though there was no face-to-face alternative.

TABLE 1 | Baseline demographic characteristics and clinical outcomes for all participants ($n = 54$).

Measure	Face-to-face PMP mean (SD)	Online PMP mean (SD)	All patients mean (SD)
Age (years)	55 (14.3)	48.3 (16.6)	52 (15.8)
Sex (female)	24 (86%)	26 (100%)	50 (93%)
Pain duration (months)	115 (117)	83.1 (80.1)	100 (101)
Average pain (NPRS)	7.5 (2.0)	7.3 (1.6)	7.4 (1.8)
Worst pain (NPRS)	8.8 (1.4)	8.8 (1.3)	8.8 (1.4)
MSK-HQ	19.4 (8.3)	17.0 (8.3)	18.3 (8.3)
PHQ-9	15.6 (6.1)	16.1 (6.3)	15.8 (6.1)
GAD-7	10.3 (6.1)	10.0 (6.4)	10.2 (6.2)
PSEQ	24.9 (15.0)	20.4 (11.4)	23.1 (13.7)

Abbreviations: GAD-7 = General Anxiety Disorder (0–21), MSK-HQ = Musculoskeletal Health Questionnaire (0–56), PHQ-9 = Patient Health Questionnaire (0–27), PNRS = Pain Numeric Rating Scale (0–10), PSEQ = Patient Self-Efficacy Questionnaire (0–60).

TABLE 2 | Pre to post changes in clinical outcomes.

	Face-to-face mean change (SD) ($n = 28$)	Online mean change (SD) ($n = 26$)	Between group difference (sig)
Average pain (NPRS)	0.6 (1.5)	0.4 (1.1)	0.2 (0.65)
Worst pain (NPRS)	−0.7 (2.2)	−0.6 (2.5)	0.1 (0.87)
MSK-HQ	6.5 (7.2)	2.9 (6.4)	3.6 (0.08)[a]
PHQ-9	−4.1 (4.9)	−0.8 (2.2)	3.3 (0.01)[a]
GAD-7	−1.9 (4.2)	0.0 (1.6)	1.9 (0.04)[a]
PSEQ	5.1 (12.0)	3.4 (6.4)	1.7 (0.56)

Abbreviations: GAD-7 = General Anxiety Disorder, MSK-HQ = Musculoskeletal Health Questionnaire, PHQ-9 = Patient Health Questionnaire, PNRS = Numeric Pain Rating Scale, PSEQ = Patient Self-Efficacy Questionnaire.
[a]Statistically sig at $p < 0.05$.

TABLE 3 | Minimal clinically important changes (MCIC) in clinical outcomes.

	Face-to-face MCIC (%) (n = 28)	Online MCIC (%) (n = 26)	Between group difference (sig)
Average pain (NPRS)	5 (18%)	2 (8%)	0.24
Worst pain (NPRS)	3 (11%)	2 (8%)	0.54
MSK-HQ	13 (46%)	5 (19%)	0.03[a]
PHQ-9	11 (39%)	2 (8%)	0.01[a]
GAD-7	7 (25%)	1 (4%)	0.03[a]
PSEQ	8 (29%)	5 (19%)	0.4

Abbreviations: GAD-7 = General Anxiety Disorder, MSK-HQ = Musculoskeletal Health Questionnaire, PHQ-9 = Patient Health Questionnaire, PNRS = Numeric Pain Rating Scale, PSEQ = Patient Self-Efficacy Questionnaire.
[a]Statistically sig at $p < 0.05$.

Interestingly, in their evidence review, the Digital Poverty Alliance (2023) highlighted that 1.7 million households in the UK have no internet access at all and 11 million people lack the digital skills required for everyday life. Moreover, in the report, 69% of those without internet access said that nothing would make them go online in the next year, with 47% stating that this was because they were not interested or saw no reason to use the internet. This highlights that online-only treatment risks excluding a significant proportion of the population from the treatment deemed most appropriate. This is especially true given that access to online resources is not equal across all groups. For example, access to the internet is much lower in older adults, adults with disabilities and those who are most financially vulnerable (Digital Poverty Alliance 2023).

Interestingly, Williams et al. (2022) also reported that over half of eligible participants declined to participate in their online PMP, even though there was no alternative at the time due to pandemic restrictions. Whilst some authors have reported that single-session telehealth interventions can be delivered successfully (Ziadni et al. 2021), a recent rapid review highlighted that there is a paucity of evidence specifically assessing the efficacy and acceptability of online PMPs (Walumbe, Belton, and Denneny 2020). Moreover, a pre-Covid-19 pandemic study examining patients with chronic pain perceptions of telerehabilitation service reported that patients place great value on face-to-face interventions and expressed concerns about the lack of peer relationships and supportive environment (Cranen et al. 2012). This is further supported by a study reporting patient experiences of online PMPs during the pandemic, in which patients found online delivery stilted the conversation, was less personal and was therefore perceived to be less effective than face-to-face care (Willcocks et al. 2023). Together, these findings highlight that, whilst online treatment may be a feasible treatment option for some patients, it is likely to exclude a significant number of people from treatment and alternative modes of treatment are also likely to be required.

It is also noteworthy that, although overall there were no significant differences between the proportion of participants completing the programmes, there appeared to be a significant change in attendance of the online programme once social distancing restrictions were lifted. Post hoc analyses were performed exploring attendance in each programme. The first programme was delivered whilst all social distancing restrictions were in place and no group mixing was permitted. This group was well attended, with 66% of participants attending at least four of the six sessions. In contrast, the final online programme was run once most social distancing requirements had been lifted. At this point, patients were able to mix socially in large groups outside of clinical environments. For this group, the proportion of patients attending at least four sessions dropped to 33%. It is possible that the group was better attended when there were no clear alternatives to treatment; however, once patients were able to resume normal activities outside of healthcare, they may have been less willing to engage in online treatment. This suggestion is supported by Fauville et al. (2021), who suggested that many people experienced 'zoom fatigue' following 2 years of social distancing requirements, and this may have accounted for the worsening attendance rates.

With regard to clinical outcomes, analyses were somewhat hampered by the poor return rate in outcome measures from patients who participated in the online programme. It is unclear precisely why return rates were lower than those in the face-to-face programme. This may have been due to the different method of collection (i.e., via online form vs. paper copy). Indeed, Ebert et al. 2018 demonstrated lower response rates with digital questionnaires versus mailed copies. Moreover, in the face-to-face programme, participants were given a questionnaire to complete in the department before they returned home. In the online group, patients had to purposefully respond to the text link to complete the questionnaire. Feasibly, a combination of time pressures, lack of IT literacy, 'digital fatigue', other distractions, or simply forgetting to complete the questionnaire may have played a part. Alternatively, it may have been that patients were dis-satisfied with treatment and therefore opted out of completing the questionnaire.

Regardless of the reason for the lower response rate, the results regarding clinical outcomes must be interpreted with some caution. It is possible that the efficacy of the online programme may have been under-estimated due to the larger proportion of data carried forward and thus patients were assumed to have made no improvement in outcome. Notwithstanding this concern, there are two interesting conclusions to be drawn from the data reported in this study. Firstly, at least for some participants, attending the online PMP resulted in clinically meaningful improvements in musculoskeletal health, anxiety, depression, and to a lesser extent pain.

Secondly, the results seem to suggest that a greater proportion of people make meaningful improvements when treated in a face-to-face programme. It is possible that not all patients respond in a similar manner to online treatment. Plausibly, some patients may engage well with remote treatment and thus find it a convenient and efficacious option. In contrast, others may find that the lack of physical interaction and difficulties with IT mean that online treatment is difficult to engage with and therefore is not an effective option for them. Both of these viewpoints were supported in the study of Willcocks et al. (2023), whereby some patients expressed a clear preference for face-to-face care, whilst others stated that they would only attend the online programme, irrespective of the pandemic.

There are a number of components which may have contributed to the apparent inferior outcomes in the online programme. Firstly, the lack of interaction when performing the exercise component may have been an important factor. Exercise has been shown to be a key component in managing long term pain (National Institute for Health and Care Excellence 2020, 2021) and has also been shown to have a positive effect on mental wellbeing (National Institute for Health and Care Excellence 2023; Singh et al. 2023). In the face-to-face programme, the usual practice was to exercise in a supervised group environment to allow the exercises to be adapted and refined to meet individual needs and therefore maximise engagement. In the online programme, therapists reported that participants frequently turned off their cameras when the exercise component of the programme was being delivered and it was therefore unclear to what extent participants were engaging with exercise. Interestingly, other groups have reported similar findings, with only 36% of participants in an online PMP reporting that participation in exercise was easy or very easy when delivered this way. Moreover, patients expressed a preference for face-to-face care when engaging in exercise (Wilcocks et al. 2023). Studies in other health conditions that have demonstrated equal efficacy of telehealth versus face-to-face care have often employed more elaborate and intensive interventions than their face-to-face counterparts (Dias et al. 2021) and it may be that future studies of online PMPs may need to employ such methods to ensure comparable exercise engagement when PMPs are delivered online.

In addition to the role of exercise engagement, exposure to activity and the subsequent reductions in fear-avoidance beliefs and catastrophizing have also been shown to be related to improvements in disability (Thompson, Antcliff, and Woby 2022). It is possible that the online nature of the programme, meant that exposure to feared activities was less than in the face-to-face programme, thus reducing the efficacy of this component of treatment. This may have been further exacerbated by the social distancing restrictions in place at the time. A key component of the PMPs was to use structured goal setting to support patients in returning to a valued activity. However, it is possible that patients could not implement this strategy as their valued activity was prohibited due to pandemic restrictions. Moreover, studies have suggested that levels of anxiety, stress and depression were significantly higher following the outbreak of the pandemic, both in the general population (World Health Organisation 2022) and among patients with chronic pain (Kleinmann et al. 2021). It is therefore plausible that pandemic restrictions and pandemic-induced anxiety and distress directly influenced outcomes following treatment. Therefore, it is important to re-assess the efficacy of online programmes outside social distance restrictions to precisely delineate the factors which impacted their efficacy.

7.1 | Strengths and Weaknesses

There are some weaknesses to this evaluation, most notably the relatively small sample size, differences in data return rate and different societal conditions during which the online programme was conducted. However, there are some notable strengths. The study was conducted in a real-world environment, including all eligible patients, giving an accurate reflection of the locally treated population. Whilst it is important to conduct a randomised controlled trial to fully assess the efficacy of the two approaches utilised in the study, the current study highlights that steps should be taken to ensure that eligible participants are not excluded due to lower levels of IT literacy and digital poverty. Moreover, the current study highlights that positive outcomes can be achieved, at least for some patients, despite challenging societal circumstances and lack of face-to-face contact.

8 | Conclusion

In response to the Covid-19 pandemic and a period of social distancing, an online PMP, as a substitute for a face-to-face PMP, resulted in positive outcomes for some patients. However, the efficacy of the online PMP appeared to be inferior to that of face-to-face programmes in terms of attendance of the programme and improvement in symptoms. The current findings suggest there is potential in online approaches to pain management, but further larger-scale trials are warranted to formally explore the relative efficacy of these approaches.

Author Contributions

Dave P. Thompson initially conceived the study. All authors were involved in the design of the article, data extraction, analysis drafting and final approval of the article.

Ethics Statement

No ethical approval was required according to the Medical Research Council/NHS Health Research Authority 'Do I need NHS REC review' tool. The study was reviewed, approved and registered with the Northern Care Alliance NHS Trust Research and Innovation Committee (NCARI) (Ref: P21HIP42). It was not possible to obtain informed consent from patients as all data were collected from the anonymised service evaluation database, meaning that data could not be linked to individual patients. This procedure was reviewed by the NCARI committee described above.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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