

Exploring Predictors of First Appointment Attendance at a Pain Management Service

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Abstract:	<p>Background: Individual characteristics such as gender, employment, and age have been shown to predict attendance at pain management services (PMS). The characteristics of those who drop out of pain management programmes have also been explored but as yet no studies have analysed the characteristics of those who do not attend the service following referral.</p> <p>Purpose: To explore the characteristics and predictors of those who attend and those who do not attend their first appointment with a PMS.</p> <p>Method: Predictive factors in the two groups - attenders (n = 425) and non attenders (n = 69) - were explored using logistic regression.</p> <p>Results: Non-attendance was significantly predicted by the patient being a smoker and the appointment being in the morning. Non-attenders also scored higher on the modified somatic perceptions questionnaire, indicating higher levels of somatic pain.</p> <p>Discussion: Predictors of non-attendance were different from those for individuals who drop out of pain services. Implications and recommendations are made for PMS.</p>

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Key words: Chronic pain, non-attendance, pain management service, logistic regression, Retrospective cohort study

Background

Chronic pain is defined as lasting more than three months, persisting longer than the normal tissue healing time. Chronic pain can impact on individuals' physical, emotional and cognitive functioning, disrupting everyday social and professional life (1). It is estimated that in the United Kingdom (UK), between one-third and one-half of the adult population live with chronic pain (approximately 28 million of individuals) (1). A more global review (2) established that 10-55% of adults experience chronic pain worldwide. Chronic pain is universally found to have a negative impact on many health and social domains making it a significant and costly public health issue (3).

In the UK, individuals who experience chronic pain may attend a specialist pain clinic for assessment and pain management. There are approximately 300 multidisciplinary Pain Management Service (PMS) providers in the UK (4). One of the most significant limitations for PMS is that the health needs of people living with chronic pain are not clearly understood. A survey estimated that only a small proportion of people living with chronic pain (approximately 20% of the population in England and Wales) seek treatment (5). It is common that services in England have a waiting time of 18 weeks or longer (4). Chronic pain is often left unmanaged due to limited availability of specialist services that help people understand and manage their pain (6).

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Some studies have explored the characteristics of individuals who tend to be referred to a PMS. Women are more likely to be referred and attend a clinic, 80% of the service users were unemployed at the time of referral and the majority were between the ages of 35-49 years old. Three-quarters of those referred also presented with mood and/or anxiety disorders (7). Fewer studies have explored the factors that predict who does not attend services. One study (8) reported that attendance may be influenced by the type of pain experienced (i.e., lower back versus rheumatoid arthritis), but the data are inconclusive. However, the predictors of those more likely to complete treatment such as a Pain Management Programme (PMP) with a PMS have been more comprehensively explored. It has been found that on the Personality Assessment Inventory (9) service users with higher levels of difficulty, who are less responsive to intervention pre-treatment are less likely to complete PMPs (10). Research has also highlighted that those with less social support, physical ability, motivation, and openness to treatment are more likely to drop out. Also, those with higher levels of distress, pain severity, and feel pain interferes more with their life also struggle to engage with PMPs (11–14).

In the UK, the national figures for non-attendance at outpatient clinics generally is 12%, with variations between specialties and regions (15). It was concluded that the main predictors of non-attendance were being male, younger, financially disadvantaged, and length of appointment waiting time. Non-attenders were also found to be less likely to own a car or be in employment. Potential barriers for non-attenders have been found to be lack of transportation, time restrictions, varying beliefs in the severity of personal state, level of need for care, and poor communication skills (16). In general, lower income has been found to be the most important predictor of non-attendance to the National Health Service (NHS).

In summary, while characteristics of people who are referred to PMS have been explored and characteristics of those who are less likely to complete a PMP have been analysed, as yet there are no studies that have explored predictors of attendance and non attendance at a PMS. The present study set out to analyse data of a specific UK PMS to explore if there are any factors that predict this for a first assessment appointment.

Method

Design

An exploratory retrospective quantitative analysis based on observational data was carried out. The participants were divided into two groups: attenders and non-attenders.

Participants

The data of the participants analysed for this study were from the patients referred to a PMS, between July 2014 and March 2015. Patients could be referred by a variety of sources, including their GPs. This initial appointment was provided by a consultant anaesthetist who explored several factors, including their suitability for a PMP. If the

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consultant considered the patient to be suitable for a PMP, the patient was provided with another assessment. Patients were often hopeful that a new treatment was available to them. Their expectations were managed during this first contact. This study focused exclusively on the initial appointment and not on the PMP related assessment. The service followed the guidelines for PMP for adults provided by the British Pain Society for its inclusion and exclusion criteria (36). Individuals presented with a range of pain conditions including arthritis, fibromyalgia, neuralgia, neuropathy, chronic regional pain syndrome, and back pain. When clients were referred to the service, they completed several questionnaires, gave consent for their information to be shared, and were provided with a first assessment appointment. When clients either attended or missed this appointment, data were collected and included in a database. The data were obtained. The sample size used in this project before data analysis was 596, which reduced to 523 participants once the data of individuals who were unable to attend the first appointment, but were rescheduled, were excluded (making the sample's binary classification of groups independent). Approximately 6% of participants were excluded from the study as they presented with a considerable amount of missing data across all measures. This process reduced the data size to 494 individuals (425 attenders, 69 non-attenders). The data of individuals which presented with missing data just in specific questionnaires were maintained, consequently the amount of participants for these measures decreased. Among the sample, the mean age was 54.64 years ($SD = 15.89$), 33.84% of the service users were male, and 14% of the sample did not attend the service (see tables 1 and 2).

Insert Tables 1 and 2 around here please

Measures

The service routinely collects the information that was analysed in this study. The following questionnaires were routinely administered to clients.

- Attendance. Considered as the dependent variable of this study, this measure described whether the client attended their first appointment or not. Data of participants who were unable to attend but were re-scheduled and attended were excluded
- Measures routinely collected by the service. Clients provided the following data.
 - Gender.
 - Pain type. The client was asked which kind of pain they experienced. Given the high percentage of individuals with back pain, this variable was dichotomised and described whether the person was diagnosed with back pain or any other kind of pain.
 - Smoking. Whether the person was a smoker or not.
 - Time of the day. Whether the person was due to attend in the morning or in the afternoon. Clients were assigned to either a morning or afternoon appointment based on the next available slot according to their position on the waiting list. Morning appointments were considered to occur between

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8.00am and 11.30am while the afternoon ones took place between 12.00pm and 16.30pm.

- Employment. Whether the person was employed or unemployed.
- Use of alcohol. Whether the person consumed alcohol or not.
- Adapted version of the McGill Pain Questionnaire (17). Clients were presented with a list of words taken from the short form of the test; the number of words circled to describe pain can range from 0-14 and include somatic (e.g., throbbing, aching) and affective words (e.g., fearful, punishing/cruel). While in the original version of the test patients weigh the level of intensity for each kind of pain, in this simpler version patients only choose the words that apply to them. **As this was an adapted version, validity and reliability were not explored.**
- Severity of pain scores. Clients were asked to give a score between 0 and 10 (where 0 = no pain and 10 = worst pain imaginable) to describe their pain level currently, at its worst in the last month and at its best in the last month. A fourth score was also taken as an average of these three scores as highly distressed service users tended to provide less variability in their scores. This measure, while routinely taken by the service, is not based on any previously used questionnaire, therefore validity, reliability and utility data are not available.
- Zung Depression Questionnaire (18). Possible scores range from 0-69 with the following cut-offs: under 17 equals normal, 17-33 equals at risk of psychological distress, over 33 equals highly distressed/depressed. This questionnaire contains 23 statements worded either positively or negatively. Clients rated how highly each statement applied to them: Never, now and then, quite often, and most of the time. A score between 0-3 is possible for each question. A high score indicates high-level depressive symptoms. This questionnaire has been found to be a valid and sensitive measure of clinical severity in people who have depression (19).
- Modified Somatic Perceptions Questionnaire (MSPQ) – range 0-39 with the cut off of under 12 considered normal, over 12 considered distressed. This measure was specifically designed as a clinical screening instrument and research tool for chronic back pain. The questionnaire contains 22 items but only 13 are scored. Items include ‘heart rate increased’ and ‘stomach churning’. Each item is ranked on a 0-3 scale where 0 = not at all and 3 = extremely/could not have been worse. A high score indicates a very high level of somatic pain symptoms. The questionnaire has been found to be reliable, with adequate construct and discriminant validity, and showed evidence of clinical utility (20).
- Pain Self Efficacy Questionnaire - range 0-60 (21). This measure explores beliefs held by clients regarding their ability to perform a range of activities while facing obstacles and adversity, such as persistent pain. There are ten items, including statements such as, “I can do most of the household chores (e.g. tidying-up, washing dishes, etc.) despite the pain”. Participants rate each item on a seven-point scale, where 0 equals ‘not at all confident’ and 6 equals completely confident’. Higher scores indicate stronger self-efficacy beliefs (22). A number of studies have supported the construct validity and the high degree of reliability of the questionnaire (21).

Procedure

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This project was approved by the relevant NHS and university ethics committees (SE0441, FHMREC16004). Only data of clients who gave consent for their data to be used for Service Evaluations were included. Data were anonymised and collected into a password-protected database. Those who did not attend their appointment and did not contact the service within 24 hours after their appointment to rebook were considered non-attenders. The first data entry of those who could not attend considered them as a non-attender. Individuals who successfully attended when rebooked, had this first data entry deleted. Therefore, only the data of those who attended or did not attend (and were not re-booked or failed to attend when re-booked) were included in this study.

Statistical Analysis

The data were analysed using IBM SPSS statistics version 22.0 (23). Logistic regression was carried out in order to identify the main predictors of the two groups (attenders versus non-attenders). Differences between attenders and non-attenders were also explored using chi-squares, T-tests, or U Mann-Whitney tests, depending on the characteristics of the data. Power analysis for logistic regression was conducted using the software G*Power 3.1.9.2 (24) to determine sample size, using an alpha of .05, a power of .80 and a medium effect size. A conservative odd ratio of 1.86 was used, following guidelines established by (25). With these assumptions, a sufficient sample size was around 345.

Results

The results of the MSPQ demonstrate the number of participants scored above the cut-off of 12, which indicated that their level of somatic pain symptoms caused high distress. The Zung results demonstrated how participants were likely to be experiencing depression when considering a cut-off score of 50 (26). The PSEQ showed how both groups were likely to have poorer self-efficacy beliefs (the cut off for a severe impairment is 20). Participants presented with high levels of pain when asked to express their pain quantitatively. The average wait time to be seen was 23 weeks. Table 2 shows the frequencies for the dichotomous data.

As can be seen in Table 1, women were more likely to be represented in both groups – attenders and non-attenders - with men representing around one-third of the referrals. While slightly less than one-third of the attenders were smokers, over half of the non-attenders were smokers. Attenders were provided with more afternoon appointments compared to non-attenders. For both groups, there were more individuals who were employed or students than unemployed and almost half of the sample reported occasional alcohol consumption.

A correlation matrix, using Spearman's correlation given the nature of the variables included, was constructed. Table 3 shows the correlations.

Insert table 3 here please

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As can be seen from this matrix (Table 3), attendance was significantly correlated with the MSPQ, $r = -.13$, with smoking, $r = -.18$, and with the time of day in which the appointment was given, $r = .12$ ($N = 494$, all $ps < .01$). These negative correlations indicate that non-attenders were more likely to have higher levels of somatic pain (based on the MSPQ) and to be smokers. The positive correlation between attendance and time of day indicated that non-attenders were more likely to have received an appointment in the morning. Surprisingly, no other variables correlated with attendance. In general, effect sizes were small (27).

A logistic regression analysis was conducted in order to ascertain the most powerful predictors of attendance at the first appointment with the PMS. The variables MSPQ, smoking, and time of day, which were significantly correlated with the variable attendance, were inserted into the logistic model with the outcome variable being attendance. A test of the full model against a constant-only model was statistically significant, indicating that two independent predictors – smoking and time of day – as a pair, reliably distinguished between attenders and non-attenders of the PMS ($\chi^2 = 22.248$, $df = 2$, $p < .001$); with a small effect (Nagelkerke's $R^2 = .79$). Prediction success was 86%. The Wald criterion (Smoking = 14.14, time of day = 5.52) demonstrated that the predictive variables were smoking and time of day contributed significantly to the prediction (respectively, $p < .001$ and $p = .019$). However, the MSPQ was not a significant independent predictor. Exp (B) value indicates that when the individual was a non-smoker, the odds ratio is 2.73 times as large and therefore the individual is 2.73 times more likely to attend the service. If the appointment is offered in the afternoon, this adds 0.46 to the likelihood of attending. In summary, the logistic regression log, $(p/1-p) = 1.787 + 1.003*\text{smoking} - .772*\text{time of the day}$, indicates a statistically significant model, but with relatively low variance explained. Tests to check whether the data met the assumption of collinearity indicated that multicollinearity was not a concern (smoking: tolerance = .96, VIF = 1.04; time of day: tolerance = .96, VIF = 1.04).

In order to explore further the experiences between attenders and non-attenders, the results of the MSPQ as the variable that significantly correlated with attendance, besides smoking and time of day, were compared to attendance. An independent-samples Mann-Whitney U test between attenders ($M = 14.10$, $SD = 8.51$) and non-attenders ($M = 17.38$, $SD = 8.83$), comparing MSPQ, revealed significant differences between attenders and non-attenders ($U = 11495$, $p = .004$), demonstrating how non-attenders present with significantly higher scores on this test.

Discussion

The overarching aim of this study was to explore the predictors of attendance at a PMS and determine the differences between attenders and non-attenders. No hypotheses were introduced given this was very much an exploratory study. While significant correlations between attenders and non-attenders were found for smoking, time of the appointment and score on the MSPQ, the only significant predictors of non attendance in a combined model were smoker status and to have been provided with an appointment in the morning.

Individuals who were referred to this specific service showed similar characteristics to those in previous research (7). Being a woman, being middle-aged and presenting with

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3 additional psychological difficulties were prominent characteristics in the sample.
4 However, unemployed people were not more likely to be referred to this specific service.
5 Despite the similarities between the sample analysed and the characteristics of the pain
6 population as examined by past research, most variables did not seem to impact
7 attendance. Although factors predicting non-attendance might be expected to mirror those
8 of individuals more likely to drop out of pain management programmes, this did not
9 appear to be the case. For example, levels of depression (27) did not affect attendance.
10 This could be due to the fact that the decision to attend a service or not is based on
11 different factors from those involved in maintaining a commitment to a programme.
12 Similarly, it was found that the main predictors of non-attendance for general NHS
13 outpatient services, such as being male, younger, financially disadvantaged and the length
14 of waiting time for their appointment (15), did not result in predicting non-attendance for
15 a PMS after a referral was made. This shows that the characteristics of individuals who
16 do not attend a PMS might be specific to the chronic pain population. Perhaps this
17 represents the fact that individuals referred to PMS were more likely to have already
18 experienced many failed treatments, compared to NHS referrals as a whole (28).
19 After analysing the regression model, it was found that people who were provided with
20 an appointment in the morning were less likely to attend their first appointment. While
21 time of the day is often considered a factor explaining attendance rates, as arguably
22 people with chronic pain may find it more difficult to attend centres in the morning, it has
23 been found that this is not always the case (29). Therefore, the time of the appointment
24 may become a predictor of attendance because of different variables intrinsic to the
25 specific centres analysed as well as a characteristic of patients with chronic pain.
26 Practical issues, such as parking or public transport accessibility, may explain this.
27 Furthermore, the regression model showed that smokers were less likely to attend the
28 service when an appointment was provided. This result was surprising, as one would
29 argue that since smokers are more likely to experience a number of other health
30 difficulties, particularly chronic illnesses (30), this would make them more motivated to
31 seek treatment. It is noteworthy that, in this study, smoking correlated with each formal
32 questionnaire provided, indicating that, in general, smokers from this sample presented
33 with higher levels of distress in terms of both pain and other areas. It could then be that it
34 is the level of pain disability which is the determining factor rather than smoking status
35 per se.

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41 However, previous research argued that smokers should be given special attention to
42 avoid drop-outs in cardiac rehabilitation programmes, as rates were higher than non-
43 smokers (31). The authors reported that this might be due to the cognitive dissonance
44 caused by the emphasis of having to quit smoking due to being in the programme.
45 Similarly, by attending a pain management service, those individuals who feel that
46 smoking could be a factor contributing to their difficulties, but are unwilling to quit,
47 might experience cognitive dissonance and decide to avoid exposure to the potential
48 professional advice to quit smoking in order to improve general health. This might be a
49 sign that an individual is less focused on caring for their health in an active manner, such
50 as using less active coping strategies, so they might be at greater odds with the ethos of a
51 PMS rehabilitation approach to coping with their pain. Furthermore, it has been found
52 that individuals with chronic pain are likely to experience other physical conditions (32),
53 of which smoking may be a contributing factors. Smokers therefore may be more likely
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to experience higher levels of physical discomfort, which in turn may impact on attendance.

In analysing mean differences, similar conclusions can be drawn on the differences found between attenders' and non-attenders' scores on the MSPQ. This showed that individuals with higher scores, and therefore individuals demonstrating behaviours indicative of physical symptoms of anxiety, were more likely not to attend. Focusing on physical symptoms is likely to both maintain anxiety processes and cause individuals to experience heightened physical discomfort. This is indirectly in line with previous research, confirming that presenting with high levels of pain negatively correlates with service engagement (12).

Anxiety related to physical symptoms may also be a sign that a patient is concerned that pain is a sign of harm/disease and may be seeking further treatment, which would not be provided by a PMS. Patients with chronic pain may have also often had a number of physical health appointments (before being referred to a PMS) where they feel they have been unheard, treated as frauds, or been left feeling hopeless as no cure or treatment has been found, so a new appointment can heighten anxiety, and in turn avoidance, based on poor previous experience (33)

Recommendations

In agreement with current UK policy, the Chronic Pain Policy Coalition (34) recognised that there is a need for redesign of NHS support to ensure that a person-centred approach to care is utilised; however, an understanding of the difficulties that this population experiences when accessing health and care services is essential. Furthermore, research at all levels of care should be implemented in order to refocus interventions. This would favour the production of guidance for the best value care in chronic pain management. Research should identify the unmet needs of the groups most affected by pain (4).

The results of this research may help in understanding these needs. First, the model can help identify individuals who are more likely to attend. Broadly, potentially the use of the MSPQ and consideration of the smoking status of the clients can aid in exploring service delivery system problems or barriers by providing useful information on clients who failure to attend an appointment, Furthermore, these results provide opportunities for implementing local changes. Centres may find it difficult to change appointment time due to staffing needs. However, when a client is more likely not to attend, based on the results provided, they could be provided with flexibility in the time of the appointment, such as being able to choose an afternoon appointment instead of a morning appointment. This should allow all suitable appointments slots to be filled rather than centres having to change their times. Furthermore, considering that morning appointments were consistently associated with poor attendance, appointment letters or phone calls can address this issue directly by including, for example, multiple appointment options (e.g., both morning and afternoon).

These clients might also benefit from a reminder, in terms of a phone call or text message, which might increase their motivation. This reminder might include an acknowledgement of the distress they are experiencing, as described by the MSPQ, normalising the experience of the client thus improving their chances of attending. As difficulties with anxiety seem to play a role in non-attendance, identifying the possible

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urge to avoid attendance and making it explicit in the reminder/appointment letter may be helpful. Reminders have been found to be effective in addressing non-attendance (35). Lifestyle characteristics that are more likely to have an impact on pain can be acknowledged and addressed properly at the time of referral, emphasising that service personnel will not be judgmental or blaming.

Limitations of the Study and Future Research

Currently, data on attendance at PMS in the UK are not held centrally so local evaluations are the only possible route to conduct research. As the data utilised were taken from a single centre, specific characteristics of the local community might not be consistent with the general population. Subsequent research that includes data from other centres would be useful to support findings. The database analysed did not contain some of the individual variables that were found to be significant in previous research, such as income level and medication intake. Furthermore, interesting variables from a psychological perspective, such as health beliefs, past experiences with service engagement, suitability for the service and expectations, were not included. Therefore, it may be useful to include these variables in future research. In addition, while previous studies focussed on attrition data as their dependent variable, these data were not available in the database analysed. It would have been interesting to compare the data of people who attended the first session and then dropped out with the data of people who did not attend after being referred. Finally, it would be useful to compare results with a study which provide a qualitative perspective in order to gain a deeper understanding on non-attendance.

Conclusion

In conclusion, being a smoker and being provided with an appointment in the morning rather than in the afternoon were predictors of non-attendance for the PMS analysed. Furthermore, non-attenders were more likely to present with high levels of somatic pain, as established by the MSPQ. The high correlation between being a smoker and the higher scores on the pain measures might indicate that higher levels of pain and distress negatively impact attendance. These results support the findings of previous research that high levels of pain are associated with service disengagement. These data can be used to address barriers in accessing PMS at national levels and to implement focused interventions (e.g., reminders) to improve attendance for this service.

References

1. Fayaz A, Croft P, Langford RM, Donaldson LJ, Jones GT. Prevalence of chronic pain in the UK: a systematic review and meta-analysis of population studies. *BMJ Open*. 2016 Jun 1;6(6):e010364.
2. Harstall C, Ospina M. How prevalent is chronic pain. *Pain Clin Updat*. 2003;11(2):1–4.

PREDICTORS OF ATTENDANCE AT PMS

10

3. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*. 2012 Dec 15;380(9859):2163–96.
4. Price C, Hoggart B, Olukoga O, de C WA, Bottle A. National pain audit final report 2010-2012. Lond Healthc Qual Improv Partnersh Br Pain Soc Dr Foster Intell [Internet]. 2012; Available from: https://www.britishpainsociety.org/static/uploads/resources/files/members_articles_npa_2012_1.pdf
5. Core Standards for Pain Management Services in the UK | The Royal College of Anaesthetists [Internet]. [cited 2018 Jul 22]. Available from: <https://www.rcoa.ac.uk/document-store/core-standards-pain-management-services-the-uk>
6. Breivik H, Collett B, Ventafridda V, Cohen R, Gallacher D. Survey of chronic pain in Europe: Prevalence, impact on daily life, and treatment. *Eur J Pain*. 2006 May 1;10(4):287–333.
7. Mailis-Gagnon A, Yegneswaran B, Lakha SF, Nicholson K, Steiman AJ, Ng D, et al. Pain Characteristics and Demographics of Patients Attending a University-Affiliated Pain Clinic in Toronto, Ontario [Internet]. *Pain Research and Management*. 2007 [cited 2018 Jul 22]. Available from: <https://www.hindawi.com/journals/prm/2007/658762/abs/>
8. Turk DC, Rudy TE. Neglected factors in chronic pain treatment outcome studies — referral patterns, failure to enter treatment, and attrition. *Pain*. 1990 Oct 1;43(1):7–25.
9. Morey LC. Personality assessment inventory. Psychological Assessment Resources Odessa, FL; 1991.
10. Hopwood CJ, Creech SK, Clark TS, Meagher MW, Morey LC. Predicting the Completion of an Integrative and Intensive Outpatient Chronic Pain Treatment With the Personality Assessment Inventory. *J Pers Assess*. 2008 Jan 1;90(1):76–80.
11. Coughlan GM, Ridout KL, Williams AC de C, Richardson PH. Attrition from a pain management programme. *Br J Clin Psychol*. 34(3):471–9.
12. Cutler RB, Fishbain DA, Cole B, Steele-Rosomoff R, Rosomoff HL. Identifying Patients at Risk for Loss to Follow-up After Pain Center Treatment. *Pain Med*. 2001 Mar 1;2(1):46–51.
13. King SA, Snow BR. Factors for predicting premature termination from a multidisciplinary inpatient chronic pain program. *Pain*. 1989 Dec 1;39(3):281–7.

PREDICTORS OF ATTENDANCE AT PMS

11

14. Kerns RD, Haythornthwaite JA. Depression among chronic pain patients: Cognitive-behavioral analysis and effect on rehabilitation outcome. *J Consult Clin Psychol.* 1988;56(6):870.
15. Sharp DJ, Hamilton W. Non-attendance at general practices and outpatient clinics. *BMJ.* 2001 Nov 10;323(7321):1081–2.
16. Dixon A, Le Grand J, Henderson J, Murray R, Poteliakhoff E. Is the British National Health Service equitable? The evidence on socioeconomic differences in utilization. *J Health Serv Res Policy.* 2007 Apr;12(2):104–9.
17. Melzack R, Katz J. McGill Pain Questionnaire. In: *Encyclopedia of Pain* [Internet]. Springer, Berlin, Heidelberg; 2013 [cited 2018 Jul 22]. p. 1792–4. Available from: https://link.springer.com/referenceworkentry/10.1007/978-3-642-28753-4_2298
18. MAIN C. The detection of psychological abnormality in chronic low back pain using four simple scales. *Curr Concepts Pain.* 1984;2:10–5.
19. Biggs JT, Wylie LT, Ziegler VE. Validity of the Zung Self-rating Depression Scale. *Br J Psychiatry.* 1978 Apr;132(4):381–5.
20. Main CJ. The modified somatic perception questionnaire (MSPQ). *J Psychosom Res.* 1983 Jan 1;27(6):503–14.
21. Nicholas MK. The pain self-efficacy questionnaire: Taking pain into account. *Eur J Pain.* 2007 Feb 1;11(2):153–63.
22. Nicholas MK, Wilson PH, Goyen J. Comparison of cognitive-behavioral group treatment and an alternative non-psychological treatment for chronic low back pain. *Pain.* 1992 Mar 1;48(3):339–47.
23. IBM. *IBM SPSS statistics 22.* N Y IBM Corp. 2013;
24. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences | SpringerLink [Internet]. [cited 2018 Jul 22]. Available from: <https://link.springer.com/article/10.3758/BF03193146>
25. Effect Sizes for 2×2 Contingency Tables [Internet]. [cited 2018 Jul 22]. Available from: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0058777>
26. Dunstan DA, Scott N. Clarification of the cut-off score for Zung’s self-rating depression scale. *BMC Psychiatry.* 2019 Jun 11;19(1):177.
27. Cohen J. *Statistical power analysis for the behavioral sciences.* Routledge; 2013.
28. Main CJ, Spanswick CC. *Pain management: an interdisciplinary approach.* Elsevier Health Sciences; 2000.

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- 1
2
3 29. Odonkor CA, Christiansen S, Chen Y, Sathiyakumar A, Chaudhry H, Cinquegrana
4 D, et al. Factors Associated With Missed Appointments at an Academic Pain
5 Treatment Center: A Prospective Year-Long Longitudinal Study. *Anesth Analg*.
6 2017 Aug;125(2):562.
7
- 8
9 30. Office of the Surgeon General (US), Office on Smoking and Health (US). The
10 Health Consequences of Smoking: A Report of the Surgeon General [Internet].
11 Atlanta (GA): Centers for Disease Control and Prevention (US); 2004 [cited 2018
12 Jul 22]. (Reports of the Surgeon General). Available from:
13 <http://www.ncbi.nlm.nih.gov/books/NBK44695/>
14
- 15
16 31. Worcester MUC, Murphy BM, Mee VK, Roberts SB, Goble AJ. Cardiac
17 rehabilitation programmes: predictors of non-attendance and drop-out
18 ,
19 Cardiac rehabilitation programmes:
20 predictors of non-attendance and drop-out. *Eur J Cardiovasc Prev Rehabil*. 2004
21 Aug 1;11(4):328–35.
- 22
23 32. Von Korff M, Crane P, Lane M, Miglioretti DL, Simon G, Saunders K, et al.
24 Chronic spinal pain and physical–mental comorbidity in the United States: results
25 from the national comorbidity survey replication. *Pain*. 2005 Feb 1;113(3):331–9.
26
- 27
28 33. Kouyanou K, E. Pither C, Wessely S. Iatrogenic Factors and Chronic Pain.
29 *Psychosom Med*. 1997 Nov 1;59:597–604.
- 30
31 34. The Hidden Suffering of Chronic Pain | Policy Connect [Internet]. [cited 2018 Jul
32 22]. Available from: <https://www.policyconnect.org.uk/research/hidden-suffering-chronic-pain>
33
- 34
35 35. George A, Rubin G. Non-attendance in general practice: a systematic review and its
36 implications for access to primary health care. *Fam Pract*. 2003 Apr 1;20(2):178–84.
37
- 38
39 36. British Pain Society. Guidelines for pain management programmes for adults. An
40 evidence-based review prepared on behalf of the British Pain Society. 2013 Nov.
41
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PREDICTORS OF ATTENDANCE AT PMS

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Tables

Table 1

Descriptive statistics

	Attendees				Non-attendees			
	<i>N</i>	Range	<i>M</i>	<i>SD</i>	<i>N</i>	Range	<i>M</i>	<i>SD</i>
MSPQ*	425	38	14.10	8.51	69	38	17.38	8.82
Zung	425	67	35.41	13.02	69	65	38.22	14.18
PSEQ**	425	59	17.06	13.40	69	49	15.17	12.70
McGill	416	14	5.24	2.93	68	11	5.15	2.59
Worst pain	388	10	9.00	1.23	62	10	9.16	1.16
Best pain	388	10	5.23	2.48	61	10	5.79	2.45
Duration	404	53	7.16	8.59	65	40	8.48	8.15
Days after referral	422	22 - 442	118.37	39.37	69	29 - 264	119.51	40.16
Age	421	17 - 89	54.05	16.24	68	18 - 90	56.78	14.13
Places of pain	404	17	4.67	3.10	68	16	4.90	3.50

*MSPQ: Modified Somatic Perceptions Questionnaire

**PSEQ: Pain Self Efficacy Questionnaire

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Table 2

Descriptive statistics of the dichotomous variable used

	Attenders		Non-attenders	
	Frequency	%	Frequency	%
Gender (male/female)	143	33.64	24	35.29
Pain Type (Back pain/any other kind of pain)	136	32.92	21	30.88
Smoking (yes/no)	121	28.60	37	54.41
Time of the day (Afternoon/Morning)	152	35.76	13	19.11
Employment (Employed/Unemployed)	262	63.74	36	58.06
Use of Alcohol (yes/no)	184	44.12	29	45.31

Note. The frequency reported refer to the first category listed in brackets

PREDICTORS OF ATTENDANCE AT PMS

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Table 3

Correlation matrix between variables

	<u>Attendan</u> <u>ce</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>
MSPQ ^{oo} (2)	-															
	.130*															
Zung (3)	-	.610														
	0.078	**														
PSEQ ^{oo} (4)	0.049	-	-													
		.424	.549													
		**	**													
McGill (5)	-	.485	.424	-												
	0.006	**	**	.291												
				**												
Worst pain (6)	-	.258	.298	-	.329											
	0.052	**	**	.420	**											
				**												
Best pain (7)	-	.199	.186	-	.121	.378										
	0.072	**	**	.293	*	**										
				**												
Duration (8)	-	.161	.103	-	.140	0.06	0.05									
	0.072	**	*	.125	**	9	1									
				**												

PREDICTORS OF ATTENDANCE AT PMS

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Sex (9)	-	-0.02	0.03	-	-	-	-	0.02							
	0.008		3	0.02	0.08	.202	.145	7							
				6	9	**	**								
Days after referral (10)	-0.03	.192	.206	-	.102	.102	0.00	.129	-						
		**	**	.151	*	*	2	**	0.00						
				**					1						
Age (11)	-	-	-	0.06	-	-	0.01	0.00	0.05	-					
	0.069	.104	0.05	1	0.07	0.06	3	7	6	.090					
		*	8	1	1	1				*					
Places of pain (12)	-	.373	.222	-	.379	.171	0.08	.182	-	.134	0.02				
	0.014	**	**	.175	**	**	8	**	.122	**					
				**					**						
Pain type (13)	0.015	-	-	0.00	-	-	-	-0.05	0.05	0.01	0.00	-			
		.136	0.08	6	.156	0.04	0.05	5	6	3	0.08				
		**	4	**	**	4	2				5				
Smoking (14)	-	.269	.269	-	.128	.122	0.04	0.01	0.04	.104	-	0.08	-		
	.186*	**	**	.220	**	**	4	6	1	*	0.05	2	0.06		
	*			**						1		2			
Time of the day (15)	.124*	-	-	.211	-	-	-	-	-	-	.119	-	0.03	-	
	*	.231	.206	**	.207	.106	0.01	0.08	0.01	.217	**	.150		.107	
		**	**	**	**	*	4	2	6	**	**	**		*	
Employment (16)	0.057	0.06	.092	-	-	.095	.163	0.05	0.08	.132	0.08	0.03	0.07	0.03	0.05
		9	*	.249	0.07	*	**	8	7	**	9	9	2		6
				**	1										

PREDICTORS OF ATTENDANCE AT PMS

Use of Alcohol (17)	-	-	-0.04	.138	0.02	-	-	-0.04	.145	-	-	-	-	0.03	-	-
	0.007	0.02		**	6	.138	0.07		**	0.03	.118	0.06	0.02	5	0.01	0.06
		9				**	7			2	**	3	3		7	8

Note. *p < .05; **p < .01.

°MSPQ: Modified Somatic Perceptions Questionnaire

°°PSEQ: Pain Self Efficacy Questionnaire

For Peer Review

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