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Review Article

Feasibility of implementation of pain education and self-management strategies in the management of chronic musculoskeletal pain in physiotherapy practice

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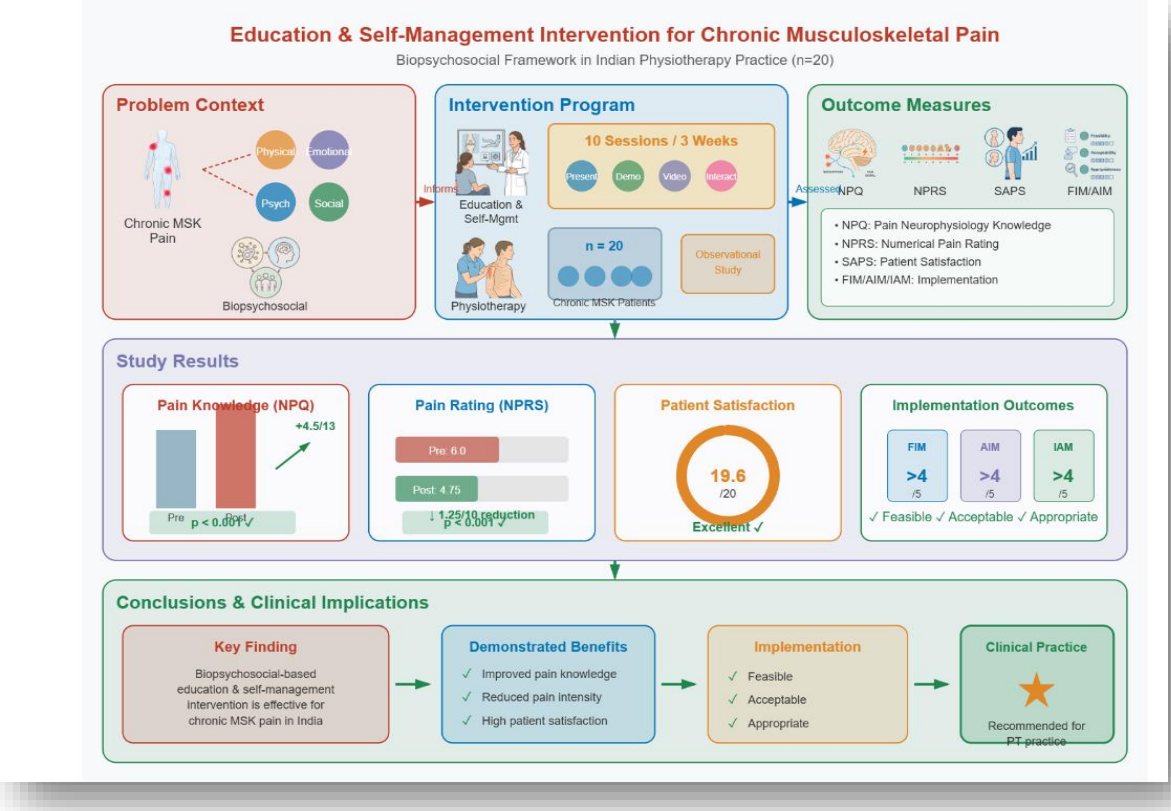
ABSTRACT

Chronic musculoskeletal pain conditions are multifaceted and influenced by various biopsychosocial factors and a biopsychosocial framework is increasingly applied in clinical practice. The present study aimed to develop and find the implementation outcomes of an education and self-management strategy-based intervention program to manage chronic musculoskeletal pain patients in physiotherapy care in India.



We used 20 chronic musculoskeletal pain patients and conducted an observational study using non-probability sampling. The patients were provided with 10 sessions (in three weeks) of education and a self-management strategy-based intervention program that included presentations, demonstrations, videos and dyadic communication or interactive sessions. We used the Neurophysiological Pain questionnaire (NPQ), the numerical pain rating scale (NPRS), Patient satisfaction questionnaire (SAPS), Feasibility of intervention measure (FIM), Acceptability of Intervention Measure (AIM) and Intervention Appropriateness Measure (IAM) as outcome measures. Data were analysed using IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.The neurophysiological questionnaire was statistically significant ($p< 0.001$) with a mean difference of 4.5/13 in the study results. The result for the numerical pain rating scale was also statistically significant ($p< 0.001$) with a difference of 1.25/10. The patient satisfaction score was 19.6/20, showing good satisfaction. The protocol's viability was demonstrated by a score greater than 4/5 for feasibility, acceptability, and appropriateness. This study concluded that a comprehensive pain intervention protocol based on a biopsychosocial model is acceptable, appropriate and feasible, with improvement in pain knowledge and patient satisfaction.

Keywords: Chronic Musculoskeletal Pain; Neurophysiology of Pain Education; Bio Psychosocial Model; Patient Satisfaction; Self-Management; Comprehensive Pain Intervention Protocol; Feasibility of intervention; acceptability of intervention; appropriateness of intervention.

INTRODUCTION

Pain is one of the major problems in recent times and challenges the healthcare system's delivery. In clinical practice, persistent or recurrent musculoskeletal pain for ≥3 months is considered to be chronic musculoskeletal pain (CMP), and the new International Classification of Diseases (ICD-11) categorizes this into primary and secondary according to the pathology of origin. Approximately 20% of the adult population lives with severe chronic pain, with a higher prevalence in women and lower-income groups. CMP is influenced by physical, emotional, psychological, and social factors, and a bio-psychosocial framework is increasingly used in clinical practice [1-5]. CMP is a major cause of increased suffering in daily activities, consumption of analgesics and disability, resulting in higher health costs globally; guidelines and recommendations emphasize the use of a biopsychosocial approach to management, including education, exercise, and psychological programs, to address patients' needs and promote activity and function [6-10].Clinicians educate patients about diseases, teach disease-specific information, and plan for contingencies. In this context, Self-management support teaches patients skills to independently manage their health conditions. Effective self-management support includes integrating it into routine healthcare and using interactive online programs. Physical therapists are well-suited to support patients with persistent musculoskeletal disorders in self-management. Adherence could be enhanced through interventions targeted at addressing a chronic condition and providing personalized self-management support for improvement.[11-13]. Implementation outcomes, such as acceptability, appropriateness, feasibility and patient satisfaction, serve as indicators of the effects of implementation processes and demonstrate effective clinical outcomes, necessitating reliable and valid measures to monitor and evaluate the success of treatment and implementation. Moreover, patients' feedback is crucial for evaluating both treatment and implementation strategies [14, 15]. Hence, the present study aimed to develop and find the implementation outcomes of an education and self-management strategy-based intervention program to manage chronic musculoskeletal pain patients in physiotherapy care. The successful implementation of this intervention protocol may vitalise and enhance the practice of physiotherapy in clinical units in India. The objectives of the study are: To find the feedback on the Implementation outcomes, to find the feedback on patient satisfaction with the intervention, and to find the change in neurophysiological pain knowledge after the intervention.

MATERIALS AND METHODS

Subjects

An observational study using a non-probability sampling was conducted on a sample size of 20 chronic musculoskeletal pain patients [16]. The Inclusion Criteria were Musculoskeletal pain for more than 3 months and individuals who are willing to give their consent; Pain between 3 and 7/10 based on the Numeric Rating Scale (NPRS)/ present in more than 2 places. The Exclusion Criteria were: Pregnancy and Congenital anomalies, Pain less than 3 months; Mentally retarded patients; Upset patients; Inflammation disease/ rheumatoid

disease; neuropathy and progressive neurological diseases and Postoperative conditions within a year.

Protocol

A patient-centred education and self-management strategy-based physiotherapy protocol **(**Pain self-management strategy protocol) providing disease-specific chronic musculoskeletal pain-related information, teaching specific disease-related pain-related neuroscience education, and contingency planning to adopt self-management principles would be implemented for 10 sessions (3Weeks Duration) apart from the regular standard physiotherapy care by three trained physiotherapy professionals through a face to face individual sessions. (Table 1)

Table 1: Education and self-management strategy-based intervention program

Sessions	Programme	Mode of intervention
1	Pain physiology and introduction to pain	PowerPoint presentation with slides
2	Pain education	PowerPoint presentation// with slides
3	Pain management	PowerPoint presentation/ with slides
4	Relaxation method	Technique demonstration practically (Jacobson's technique) + online video
5	Sleep hygiene	PowerPoint Animation +patient patient-centred discussion
6	Physical activity	SMART protocol education + walking
7	Social relationships and lifestyle	PowerPoint presentation and patient-centred discussion
8	Mental health and emotions	Power Point Animation
9	Revision of sessions 1,2,3,4	Clarification of sessions/patient-centred discussions
10	Revision of sessions 5,6,7, 8	Clarification of sessions/patient-centred discussions

Outcome measures

Implementation outcome measures such as the Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) were used [14]. Short assessment of patient satisfaction scale (SAPS): The patient satisfaction scale measures whether patients are happy with their healthcare. A measure of care quality, including the effectiveness of their care and their level of empathy [17].The Neurophysiology Pain Questionnaire: The Neurophysiology of Pain Education Questionnaire assesses how an individual conceptualises the biological mechanisms that underpin their pain.[18]; Numerical pain rating scale (NPRS): The average of the 3 ratings was used to represent the patient's level of pain over the previous 24 hour.

Procedure

The study was conducted between October 2023 to April 2023. The ethical approval was taken from the Institutional Ethics and Scientific Committee of SCOP (Ref: SMT/SCOP/BPT/22-23/619). To collect the data, a data collection sheet was used, which included demographic data and outcome measures. Informed Consent was taken, and the objective of the study was explained to the subjects before the data collection. The template for intervention description and replication (Tidier)checklist and guide was used to report the study.

Statistical analysis

The categorical variables were presented in percentages, and numerical variables in terms of mean and standard deviations for the demographic and clinical outcomes. Descriptive analyses were used for analysis. Data were analysed using IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.

RESULTS

The study involved 20 patients (16 females and 4 males) suffering from chronic musculoskeletal pain. Their average age was 51.05±16.67 years (ranging from 19 to 83 years), and the average duration of their suffering was 25.20±27.43 months (ranging from 4 to 120 months). The study involved an education and self-management strategy-based intervention program, which is presented in Table 1. Clinical outcomes before and after the intervention are presented in Table 2, while implementation outcomes of the intervention protocol from treatment providers and patients are presented in Tables 3 and 4, respectively.

Table 2: Implementation outcomes of the intervention protocol from treatment providers

Implementation measures	Treatment provider 1	Treatment provider 2	Treatment provider 3
Acceptability of Intervention Measure (AIM)			
Pain self-management strategy protocol meets my approval	4	4	4
The pain self-management strategy protocol is appealing to me	4	4	4
I like the pain self-management strategy protocol	4	4	4
D.I welcome the pain self-management strategy protocol.	4	4	4
Intervention Appropriateness Measure (IAM)			
The pain self-management strategy protocol seems fitting	3	3	5
The pain self-management strategy protocol seems suitable	4	4	3
The pain self-management strategy protocol seems applicable	5	3	3
The pain self-management strategy protocol seems like a good method.	5	3	3
Feasibility of Intervention Measure (FIM)			
The pain self-management strategy protocol seems implementable	5	4	4
The pain self-management strategy protocol seems possible.	5	3	4
The pain self-management strategy protocol seems doable	4	4	5
The pain self-management strategy protocol seems easy to do.	5	3	4

[Response Scale: 1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree]

Table 3: Implementation outcomes of the intervention protocol from patients

Implementation measures	Average response of patients
Acceptability of Intervention Measure (AIM)	4.24±0.19
Pain self-management strategy protocol meets my approval	4.00
The pain self- management strategy protocol is appealing to me	4.05±0.22
I like the pain self- management strategy protocol	4.65±0.49
I welcome the pain self- management strategy protocol.	4.25±0.44
Intervention Appropriateness Measure (IAM)	4.01±0.19
Pain self-management strategy protocol seems fitting	3.95±0.33
The pain self-management strategy protocol seems suitable	4.20±0.41
Pain self-management strategy protocol seems applicable	4.05±0.39
The pain self-management strategy protocol seems like a good method.	3.85±0.59
Feasibility of Intervention Measure (FIM)	4.30±
Pain self-management strategy protocol seems implementable	3.95±0.99
Pain self-management strategy protocol seems possible.	4.35±0.49
Pain self-management strategy protocol seems doable	4.45±0.51
The pain self-management strategy protocol seems easy to do.	4.45±0.60

[Response Scale: 1 = Completely disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Completely agree]

Table 4Clinical outcomes before and after the intervention

Outcome measures	Before the intervention	After the intervention
[#] **Patient satisfaction** (SAPS) (0-28)	-	19.60±1.27
* **Pain (NPRS)- (0–10-point scale)**	5.15±1.42	3.90± 1.25
[$] **Pain knowledge (NPQ) -(0-13)**	5.35±2.58	9.55±2.19

[[#] 0 to 10 = Very dissatisfied; 11 to 18 = Dissatisfied; 19 to 26 = Satisfied; 27 to 28 = Very satisfied; *Low score indicates less pain; [$] More score indicates good neurophysiological pain knowledge].

DISCUSSION

According to the current evidence, Chronic musculoskeletal pain is a general issue in physiotherapy practice that significantly impacts the quality of life, functional ability, and psychological well-being of affected individuals. Effective management strategies require a combination of biomedical and psychosocial approaches in healthcare delivery. The present study aimed to develop and evaluate an education and self-management strategy-based intervention program by physiotherapists tailored to manage chronic musculoskeletal pain patients.

Protocol development and implementation

After thoroughly reviewing the contemporary existing literature on chronic musculoskeletal pain and its physiotherapy management strategies, an education and self-management strategy-based protocol was created. The principal investigator and three trainee physiotherapists, who actively participated in discussions and planning through a WhatsApp group to develop this protocol with 10 structured sessions (Table 1). To ensure the delivery of the protocol, physiotherapists completed eight hours of intensive training over two weeks, focusing on chronic musculoskeletal pain, neurophysiological pain education, and self-management strategies before implementation. The intervention sessions carried out in two settings: a physiotherapy primary care clinic or during home visits.

Patient outcomes

Despite a reduction in pain scores, the change was not clinically significant. However, a significant change was found in the patients' understanding of pain and their self-management strategies. These changes could have occurred due to the pain knowledge sessions aimed to enhance the insights into the physiology and mechanisms of pain, and autonomy due to self-management strategies in managing chronic musculoskeletal pain (Table 2), which may contribute to long-term benefits in managing their condition.

Patient satisfaction and acceptability

The various aspects of patient satisfaction is a key indicator of the effectiveness of therapeutic interventions. And the ability of the healthcare provider to communicate and show the empathy during treatment is vital for success of an intervention. The education and self-management strategy-based intervention protocol was well-received, with patients expressing satisfaction with the information and the delivery of contents during the sessions. High levels of acceptance and appreciation of the intervention was expressed by the patients through a standardised satisfaction scale (Table 2).

The structured sessions lasted between 14 and 19 minutes and engaged patients and the provider without significant disruptions in routine physiotherapy practice. The feasibility, acceptability and appropriateness of the intervention were very well agreed by the patients (Tables 3 & 4).

Healthcare provider feedback

A structured 15-minute interview was conducted with all three healthcare providers to obtain their experiences and insights regarding the implementation scenario of the protocol. The results of the interviews revealed that the

patients exhibited varying degrees of prior knowledge about pain, which influenced their levels of engagement and outcomes. Despite successful sessions, providers faced challenges in explaining concepts to less educated patients, as some required additional clarification. Low patient motivation also affected engagement. However, patients responded positively to relaxation techniques and SMART goal-setting sessions, indicating that these approaches met their immediate needs. Providers highlighted the importance of strong communication skills and ongoing feedback for sustained patient engagement, while also emphasising professionalism and adherence to standards for successful session delivery.

The results of this study clearly align with existing literature that emphasizes the critical importance of education and knowledge about pain mechanisms and self-management strategies. Adequate training significantly favours healthcare providers' confidence in delivering the content and directly improving patient care. Furthermore, this training drives a necessary paradigm shift of physiotherapy clinical practice from a purely biomedical approach to a comprehensive biopsychosocial care in physiotherapy practice. Patient education programs, whether conducted in person through engaging group sessions, online, or through support groups, have proven to be effective. They help individuals feel more confident and empowered, leading to better self-management of their health. Research also demonstrates that patients who actively engage in self-management techniques achieve significant improvements in their health outcomes. And psychological strategies such as cognitive behaviour modification and mindfulness, when included in practice, further enhance pain management[17].

As a study, the present study has strong methodological inputs, including the use of a structured patient-centred intervention, adherence to the biopsychosocial model, and the use of patient-reported outcome measures. However, the limitations that could be acknowledged include a small sample size, short follow-up duration, and potential biases from the self-reported outcome measures. Further, the physiotherapists may consider exploring digital platforms for delivery [14].

CONCLUSION

The present study results conclude that the successful implementation of an education and self-management-based pain intervention protocol for patients with chronic musculoskeletal pain is feasible in physiotherapy clinical practice.

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