



The Changes in Psychological and Functional Limitation after Pain Neuroscience Education in Chronic Non-Specific Neck Pain: (A Quasi Experimental Study)

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ABSTRACT

Background: Chronic Non-specific neck pain is a common disorder that causes ramifications from psycho-social factors. Can be related to limited cervical mobility, impaired functions, and stress at work Pain is a common human experience, and the inability to feel pain poses a risk to a person's survival. PNE explains how pain operates fundamentally, including three core bio-psychosocial therapeutic options that are biological, psychological, and social.

Objective: To study the impact of PNE on psychosocial and functional limitations in patients with chronic non-specific neck pain.

Methods: The study is a quasi-experimental study comprising 85 participants, with pre-test (Group A) and post-test (Group B) receiving PNE.

Results: The mean NPRS scores obtained in the PNE group were 5.63 ± 1.3 in the pre-test and 2.3 ± 1.2 in the post-intervention, and the mean difference was 3.33 (Mean of paired differences). The mean PCS scores obtained in the PNE group were 25.09 ± 4.31 in the pre-test and 12.04 ± 4.25 in the post-intervention, and the mean difference was 13.05. The mean NDI scores obtained in the PNE group were 30.67 ± 17.34 in the pre-test and 7.50 ± 3.74 in the post-intervention, and the mean difference was 23.17. It shows significant improvement in pain intensity and functional limitations.

Conclusion: The present study concluded that pain neuroscience education has an impact on changing psychosocial and functional limitations in patients with chronic non-specific neck pain using the Neck Disability Index, Pain Catastrophizing Scale, Numerical Pain Intensity Scale, and Neurophysiology of Pain Questionnaire.

KEYWORDS: Functional Limitations, Neuroscience Education, Neck Pain.

INTRODUCTION

Nonspecific chronic neck pain is common disorder that causes a great impact, and it is greatly influenced by psychosocial factors. It is the commonest cause of neck symptoms and results from postural and mechanical cause, caused due to lack of specific pathology or it can also occur as a process of ageing.[1] Strong associations between neck pain and psychosocial elements that affect pain perception, such as catastrophism, stress, anxiety, and depression.[2] Neck muscles myofascial pain syndrome, reduced function, restricted cervical mobility, and workplace stress are all associated with chronic non-specific neck pain. Functional restriction and disability are related in patients with chronic pain.[3]

Discomfort in the neck common musculoskeletal distribute that can have impact on person's health, social life and mental health as well as raising expenses for public and private sectors. [4] The central nervous system exhibits hyper excitability in chronic pain, which is also known as central sensitization.. Healthcare practitioners have the opportunity to explain central sensitization's mechanism through the study of pain neuroscience, which also incorporates behavioral, psychological, and environmental factors that contribute to the persistence of pain. [5] the most recent researches validate the administration of Pain neuroscience education persistent musculoskeletal dysfunction for minimizing pain razing patients grasp on enhancing the performance minimizing the impairment reducing the social and psychological elements activity including lowering the medical services need.[6]

Pain neuroscience education (PNE) can be utilized as basic strategy with bio-psychosocial therapeutic mode for chronic pain are encompasses evidence based therapy[7] Various researches prominently focused on PNE application for patient care[8]

Thus persistent pain leads to have a great impact on the social health impose the limitation of function of the individual's life.[9]

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AIM AND OBJECTIVE

This study aimed to find the changes in psychosocial and functional limitation after pain neuroscience education in chronic non-specific neck pain patient.

METHODS

In this quasi experimental study, 90 participants were screened for eligibility out of which 5 participants had to be excluded (not meeting inclusion criteria (n=2), declined to participate (n=1), and others (n=2), resulting in 85 participants agreeing to participate in this study. In which 30 were male and 55 were female with the age criteria of 18 to 60 years. The patient's selection criteria included consent in the study for attending training session, and having pain for more than 3 months. Pain Neuroscience Education was given to patients which included basic explanation of pain and its mechanism, Central and peripheral sensitization, Pain and its context with various factors affecting pain and psychology behind pain using power point presentation and visual imaging. Patients were given a pre and post session questionnaire which included Neck Disability Index (NDI), Pain Catastrophizing Scale (PCS), Numerical Pain Rating Scale (NPRS), Neurophysiology of Pain Questionnaire (NPQ).

NDI is a ten-item questionnaire including pain, personal care, work, sleeping, lifting, recreation that analyses disability caused by neck pain. PCS is a 13-item instrument defining the degree of thoughts and feelings when they are in pain using 0 to 4 scale assessing rumination, magnification and helplessness. NPRS is 11 point numerical scale ranging from 0 representing no pain to 10 representing worst pain. It measure pain intensity in adult's and less educated patients, and is useful for the assessment of chronic pain. NPQ which includes 13 questions related to pain neurophysiology used to assess patients' ability to comprehend the neurophysiology of pain and for better understanding after PNE session. The validity and reliability of the scales were proven by various studies in which these tools were used.

STATISTICAL ANALYSIS

The collected data was tabulated for demographic variables such as age, gender, weight etc. Also, data was represented in form of visual impressions like bar diagram and tables etc. Along with that Mean, SD, p-value, paired t-test pre, and post comparison were carried out.

RESULT

In this study the post score for NDI, PCS, and NPRS was reduced while the post score of NPQ was increased after Pain Neuroscience Education reflecting reduction in pain intensity and significant improvement in psychological and functional limitation in chronic non-specific neck pain patients.

In Table No- 2 shown the mean Numerical Pain Rating Scale scores obtained in the Pain Neuroscience Education group were 5.63 ± 1.3 in the pretest and 2.3 ± 1.2 in the post-intervention, and the mean difference was 3.33 (Mean of paired differences) The 95% confidence interval of the difference was indicated that the NPRS score improved in the post-intervention and the difference was statistically significant ($P < 0.05$) in figer-3 which shows mark decrease in the pain intensity after Pain Neuroscience Education in Chronic Non-specific Neck Pain patients.

The mean of Pain Catastrophizing scale scores obtained in the Pain Neuroscience Education group shown in the Table-3, were 25.09 ± 4.31 in the pretest and 12.04 ± 4.25 in the post-intervention, and the mean difference was 13.05 (Mean of paired differences). The 95% confidence interval of the difference was indicated that the Pain Catastrophizing scale score improved in the post-intervention and the difference was statistically significant ($P < 0.05$) in figer-3 which shows deterioration in extent of catastrophic thinking due to pain and improving Psychosocial aspect after Pain Neuroscience Education in Chronic Non-specific Neck Pain patients.

As demonstrated in Table-4 the mean Neck Disability Index scores obtained in the Pain Neuroscience Education group were 30.67 ± 17.34 in the pretest and 7.50 ± 3.74 in the post-intervention, and the mean difference was 23.17 (Mean of paired differences) The 95% confidence interval of the difference was indicated that the Neck Disability Index score improved in the post-intervention and the difference was statistically significant ($P < 0.05$) in figer-3 which shows significant reduction in functional limitations and improvement in functional activities after Pain Neuroscience Education in Chronic Non-specific Neck Pain patients.



A. Figure

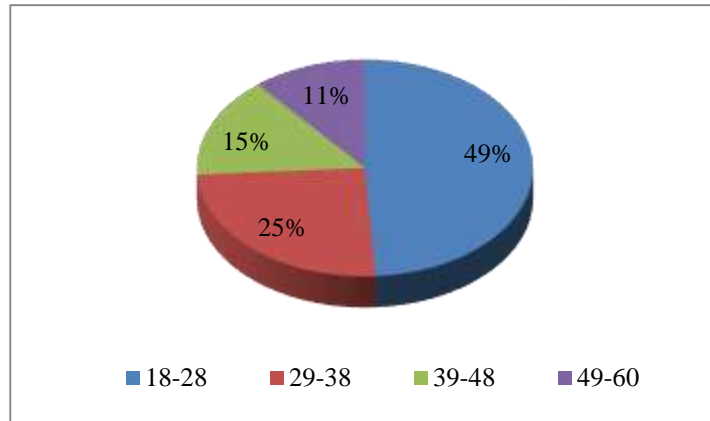


Figure 1. Age Distribution

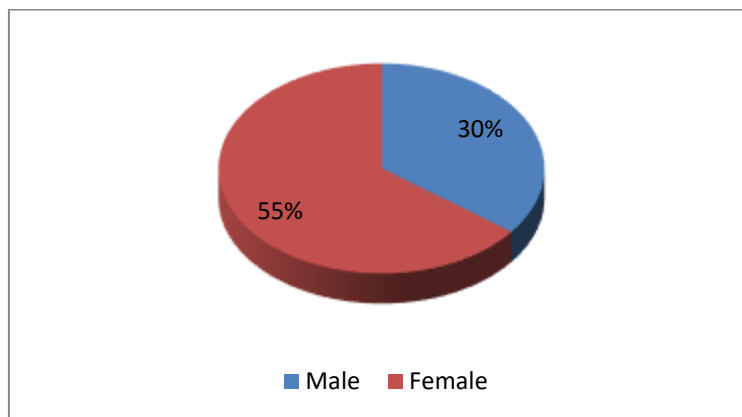


Figure 2. Gender Distribution

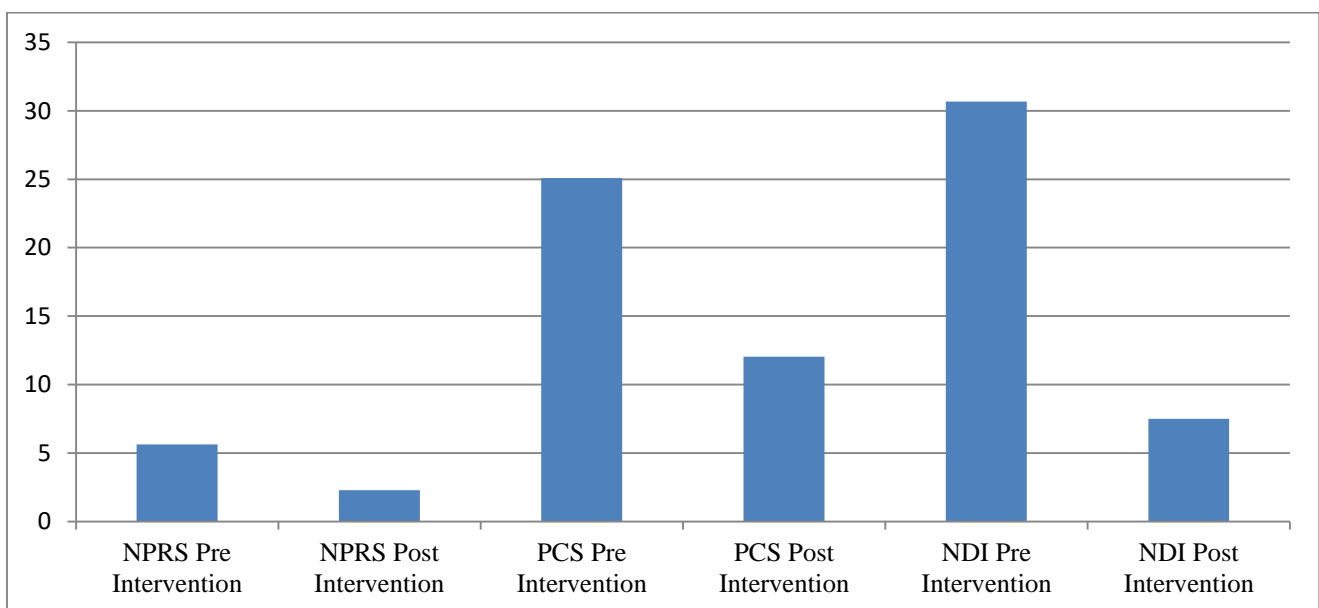


Figure 3. Mean No. of Pre and Post Intervention using Numerical Pain Rating Scale (NPRS), Pain Catastrophizing scale (PCS), Neck Disability Index (NDI)



B. Table

Table I. AGE AND GENDER DISTRIBUTION

Sr. No.	Age (Years)	Number of Male	Number of Female	Total	Percentage
1	18-28	11	31	42	49 %
2	29-38	8	13	21	25 %
3	39-48	9	4	13	15 %
4	49-60	2	7	9	11 %
5	Total	30	55	55	100 %

Table II. WITHIN-GROUP COMPARISON OF THE NPR SCORES MEAN PRETEST AND POST-INTERVENTION

Sr. No.	Outcome Parameter	At baseline Mean ± SD	Post-intervention Mean ± SD	Mean Paired Differences	of p-value
II	Numerical Pain Rating	5.63±1.3	2.3±1.2	3.33	< 0.001

Table III. WITHIN-GROUP COMPARISON OF THE PCS SCORES MEAN PRETEST AND POST-INTERVENTION

Sr. No.	Outcome Parameter	At baseline Mean ± SD	Post-intervention Mean ± SD	Mean Paired Differences	of p-value
III	Pain Catastrophizing scale (PCS)	25.09±4.31	12.04±4.25	13.05	<0.0001

Table IV. TABLE III WITHIN-GROUP COMPARISON OF THE NDI SCORES MEAN PRETEST AND POST-INTERVENTION

Sr. No.	Outcome Parameter	At baseline Mean ± SD	Post-intervention Mean ± SD	Mean Paired Differences	of p-value
IV	Neck Disability Index (NDI)	30.67±17.34	7.50±3.74	23.17	<0.00001

DISCUSSION

The Purpose of this study was to see the changes in psychosocial and functional limitation after pain neuroscience education in chronic non specific neck pain patients. The purpose of PNE was to explain how pain operates in fundamental way. Basically three core Bio-psychosocial components were included which targeted Biological aspect, Psychological aspect and Social aspect of patients with non-specific chronic neck pain. As we, correctly formulated hypothesis prior to initiate PNE has proven impact on the perception level also affects the functional abilities of the patient in order to reduce disability and functional limitations as shown in figure -3.

Ibai López-de-Uralde-Villanueva et al. Work (2017) concluded that when compared to asymptomatic subjects and people with chronic nonspecific neck pain have more functional restrictions and associated psychosocial variables, and demonstrated association of psychological problems in people with a lower level of strength[10]



James A Watson et al. J Pain.(2019)Oct. reveals PNE's efficacy in the treatment of chronic neck pain in adults, including pain, disability, and psychosocial effects researchers found that PNE exposures can improve the patient perception of pain, such as allowing the patient to narrate their experience. These elements could help change their own concept of pain.[11]

The Functional limitation of neck movements was assessed using NDI (Neck Disability Index). NDI scores obtained in Group A (Pre-test Group) was 30.67 ± 17.34 in Group B (Post-test PNE Group) was 7.50 ± 3.74 in the post-intervention, and the mean difference was 23.17 (Mean of paired differences) The 95% confidence interval of the difference was indicated that the NDI score improved in the post-intervention and the difference was statistically significant with ($P < 0.05$) which shows significant reduction in functional limitations and improvement in functional activities.

For better understanding the knowledge of patients who received PNE, neurophysiology of pain questionnaire (NPQ) was used which showed significant improvement in the knowledge of patients with chronic non-specific neck pain after pain neuroscience education in Group B (Post-test PNE Group) as compared to Group A (Pre-test group).

So this research found that Group B (Post-test PNE Group) shows significant improvement in Function activities and the psychological aspect while decrease in pain intensity of the patients with Chronic Non-specific Neck Pain than Group A (Pre-test group).

IMPLICATION OF THE STUDY

Present research findings can be useful for researchers, academician, and clinical practitioner for patient's future benefits

CONCLUSION

Pain neuroscience education has significant impact on the psychosocial and functional limitation in chronic non-specific neck pain. Individual's life, which has a direct impact on the perception level and also affects the functional activities. This trial concluded that Pain Neuroscience Education has a significant impact on changing Psychosocial and Functional limitations in patients with Chronic Non-specific Neck Pain using Neck Disability Index, Pain Catastrophization Scale, Numerical Pain Intensity Scale, and Neurophysiology of Pain Questionnaire.

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CONFLICT OF INTEREST: No any conflict of interest

ETHICAL APPROVAL: Research initiated only after the approval from research committee of MGM-ECRHS. Approval of the study was given from Ethical Committee for research on human subjects. Permission was obtained from member secretary of MGM-ECRHS, MGM Medical College, and Aurangabad. Confidentiality was maintained by using obtained data only for study purpose.

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PATIENT CONSENT: All the patients submitted consent for enrolling in this research and attending training sessions.

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