



Effectiveness of Physiotherapy (Short Wave Diathermy) in Reducing Chronic Neck Pain

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(Received: 27 November 2015 Revised: 05 December 2015 Accepted: 10 January 2016)

KEYWORDS

Chronic neck pain, Physiotherapy, Short Wave Diathermy, Pain reduction, Functional outcome, Visual Analogue Scale (VAS), Bangladesh

ABSTRACT:

Background: Chronic neck pain is a prevalent musculoskeletal disorder contributing to significant functional disability and reduced quality of life worldwide. Physiotherapy has been recognized as an effective, non-pharmacologic approach for managing chronic neck pain; however, local evidence on its effectiveness in Bangladesh remains limited.

Objective: This study aimed to evaluate the effectiveness of physiotherapy (Short Wave Diathermy) in reducing pain intensity and improving functional outcomes among patients with chronic neck pain attending a tertiary hospital in Bangladesh.

Methods: A prospective observational study was conducted in the Department of Physical Medicine at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from January to December 2015. A total of 51 patients aged 18 years and above with chronic neck pain (duration ≥ 3 months) were enrolled using a purposive sampling technique. Participants underwent a structured physiotherapy program comprising hot pack therapy, isometric and stretching exercises, and postural correction with ergonomic education over a 4-week period. Pain intensity was assessed using the Visual Analogue Scale (VAS) before and after physiotherapy. Data were analyzed using SPSS, and a p-value < 0.05 was considered statistically significant.

Results: Among 51 participants, 56.9% were female and 43.1% were male, with a mean age of 38.7 ± 9.5 years. The mean pre-treatment VAS score was 7.26 ± 1.12 , which significantly decreased to 3.18 ± 1.07 post-treatment ($p < 0.001$). Marked functional improvement was observed, with 90.2% reporting better neck movement, 84.3% improved daily activity performance, and 80.4% improved sleep quality. No significant association was found between pain reduction and socio-demographic variables ($p > 0.05$).

Conclusion: Physiotherapy (Short Wave Diathermy) was found to be highly effective in reducing chronic neck pain and improving functional outcomes, regardless of age, gender, or occupation. These findings support the integration of structured physiotherapy programs into routine clinical care as a safe and cost-effective management strategy for chronic neck pain in Bangladesh.

INTRODUCTION

Neck pain is a common musculoskeletal disorder and a leading cause of disability worldwide, affecting physical function, quality of life, and work productivity [1,2]. Globally, the prevalence of neck pain has steadily increased over the past decades, with substantial variation across regions and populations [2]. Chronic pain, including neck pain, is a significant public health concern globally. Systematic reviews indicate that the prevalence of chronic pain in the general population is substantial, with prevalence varying between 0.4% and 86.8%, with a mean of 23.1%. [3]. In Asian populations, chronic pain is also highly prevalent, affecting a considerable proportion of adults and impacting daily functioning and quality of life [4]. In Bangladesh, musculoskeletal conditions, including

neck pain, are highly prevalent and contribute significantly to disability and daily functional limitations among adults [5].

Short Wave Diathermy has emerged as a cornerstone in the management of chronic neck pain. Interventions like manual therapy, exercise therapy, and ergonomic education have demonstrated efficacy in reducing pain and improving function. A systematic review by Damgaard et al. (2013) concluded that Short Wave Diathermy interventions are effective for patients with chronic neck pain [6].

Management of chronic neck pain involves a combination of pharmacologic and non-pharmacologic approaches aimed at reducing pain, restoring function,



and improving quality of life. Non-pharmacologic interventions are considered first-line treatments due to their safety and effectiveness in the long term [7,8]. SWD plays a central role in this approach, incorporating exercise therapy, manual therapy, postural correction, and ergonomic education to address musculoskeletal impairments [9,10]. Exercise-based interventions, guided by the frequency, intensity, time, and type (FITT) principle, have been shown to significantly reduce pain and improve functional outcomes in patients with chronic neck pain [9]. Furthermore, SWD not only alleviates pain but also enhances neck mobility, daily activity performance, and work efficiency, highlighting its importance in comprehensive pain management [8,11]. Given the limited efficacy and potential side effects of long-term pharmacologic treatments, Short Wave Diathermy represents a safe and effective cornerstone in managing chronic neck pain.

Despite the growing burden of musculoskeletal disorders in Bangladesh, evidence on the outcomes of SWD interventions for chronic neck pain remains limited. Generating local evidence is essential to guide clinical practice, optimize rehabilitation strategies, and improve patient quality of life through evidence-based Short Wave Diathermy care. This study aims to evaluate the effectiveness of SWD in reducing pain and improving function in patients with chronic neck pain in Bangladesh. Additionally, it seeks to assess the influence of socio-demographic factors on treatment outcomes, thereby contributing to a more personalized approach in managing this prevalent condition.

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Physical Medicine at a Bangabandhu Sheikh Mujib Medical University (BSMMU) in Bangladesh over a period of twelve months, from January to December 2015. The study aimed to evaluate the effectiveness of physiotherapy in reducing chronic neck pain among patients attending the Psychical Medicine outpatient department.

The study population consisted of patients aged 18 years and above who attended the physiotherapy unit with complaints of chronic neck pain. Chronic neck pain was defined as pain persisting for three months or more, localized to the cervical region and not associated with acute trauma or systemic disease.

A total of (mention the number, e.g., 50) patients were included using a purposive sampling technique. The sample size was determined based on feasibility and patient availability during the study period.

Data were collected using a pretested semi-structured questionnaire that included information on socio-

demographic characteristics, clinical history, and pain assessment. The severity of neck pain was measured using the Visual Analogue Scale (VAS) before and after completion of physiotherapy sessions.

Inclusion Criteria

- Patients diagnosed with chronic neck pain of musculoskeletal origin.
- Age \geq 18 years.
- Patients who consented to participate and completed the prescribed physiotherapy sessions.

Exclusion Criteria

- Neck pain due to trauma, fracture, malignancy, infection, or inflammatory diseases.
- Patients with a history of cervical spine surgery.
- Those receiving concurrent alternative treatments for neck pain (e.g., acupuncture, chiropractic therapy).

Each participant underwent a structured physiotherapy program comprising:

- Short Wave Diathermy: (20 minutes Daily)
- Hot pack therapy, at home.
- Isometric and stretching exercises for the neck,
- Postural correction training and ergonomic advice.

Sessions were provided 3–5 times per week for 4 weeks under the supervision of a registered physiotherapist. Follow-up assessments were done at baseline (pre-treatment) and after completion of therapy (post-treatment).

The primary outcome measure was the change in pain intensity as assessed by the VAS score between the pre-treatment and post-treatment phases. Improvement in neck mobility and functional performance were considered as secondary outcomes based on patient self-report and physiotherapist observation.

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of the Bangabandhu Sheikh Mujib Medical University (BSMMU). Informed written consent was taken from each participant before enrolment. Confidentiality, privacy, and the right to withdraw at any stage were strictly maintained.

Data Analysis

Data were coded, entered, and analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize data. The difference in mean VAS scores before and after physiotherapy was analyzed using the paired t-test for normally distributed data and the Wilcoxon signed-rank test for non-parametric data. A p-value less than 0.05 was considered statistically significant.



RESULTS

A total of 51 patients diagnosed with chronic neck pain were included in the study. All participants completed the full course of physiotherapy sessions and follow-up assessments. Physiotherapy significantly reduced pain intensity and improved the functional status of patients suffering from chronic neck pain ($p < 0.001$). The majority of patients reported notable relief in pain and

enhanced daily activity performance after completion of therapy sessions.

Of the 51 participants, 29 (56.9%) were female and 22 (43.1%) were male. The mean (\pm SD) age was 38.7 ± 9.5 years, with the majority belonging to the 31–40 years age group (41.2%). Most participants were service holders (35.3%) or housewives (31.4%) (Table 1).

Table 1. Distribution of participants by socio-demographic characteristics (n = 51)

Variable	Category	n	%
Age group (years)	21–30	10	19.6
	31–40	21	41.2
	41–50	13	25.5
	>50	7	13.7
Gender	Male	22	43.1
	Female	29	56.9
Occupation	Service holder	18	35.3
	Housewife	16	31.4
	Student	8	15.7
	Others	9	17.6

The mean duration of neck pain among participants was 7.2 ± 3.1 months (range: 3–15 months). Most patients (58.8%) reported pain related to poor posture or prolonged computer/mobile use, while 27.5% attributed their pain to occupational strain.

Table 2. Clinical characteristics of neck pain among participants (n = 51)

Variable	Category	n	%
Duration of pain (months)	3–6	22	43.1
	7–9	17	33.3
	≥ 10	12	23.6
Probable cause of pain	Poor posture/prolonged sitting	30	58.8
	Work-related strain	14	27.5
	Others	7	13.7

Pain intensity was assessed using the Visual Analogue Scale (VAS) before and after physiotherapy intervention. The mean pre-treatment VAS score was 7.26 ± 1.12 , while the mean post-treatment score was 3.18 ± 1.07 , indicating a significant reduction in pain intensity ($p < 0.001$). The mean reduction in pain was 4.08 ± 1.29 .

Table 3. Comparison of mean VAS scores before and after physiotherapy (n = 51)

Assessment time	Mean \pm SD	Mean difference \pm SD	t-value	p-value
Before physiotherapy	7.26 ± 1.12			
After physiotherapy	3.18 ± 1.07	4.08 ± 1.29	22.57	<0.001

Regarding overall improvement, 43 patients (84.3%) reported marked improvement in pain and functional ability, whereas 8 patients (15.7%) reported mild improvement. None of the participants experienced worsening of symptoms (Figure 1).

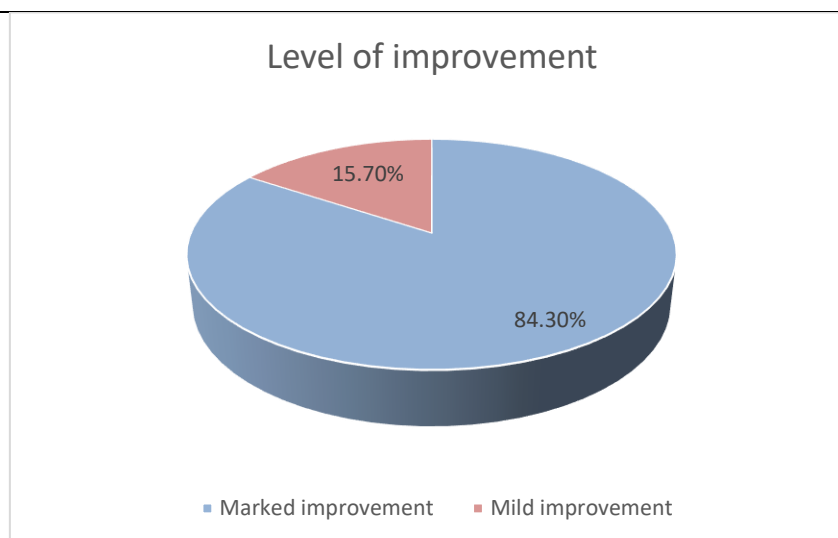


Figure 1. Distribution of participants according to perceived improvement following physiotherapy (n = 51).

Table 4 presents the relationship between socio-demographic characteristics and pain reduction following physiotherapy. The mean pain scores before and after physiotherapy were compared across different age groups, genders, and occupations. Although all

groups showed substantial improvement in pain scores after therapy, the degree of pain reduction did not differ significantly between them ($p > 0.05$), indicating that physiotherapy was equally effective irrespective of age, sex, or occupation.

Table 4. Association between Socio-demographic Factors and Pain Reduction after Physiotherapy.

Variables	Categories	Mean VAS (Before) \pm SD	Mean VAS (After) \pm SD	Mean Difference \pm SD	<i>p</i> -value
Age group (years)	21–30	7.10 \pm 1.05	3.05 \pm 1.02	4.05 \pm 1.21	0.87
	31–40	7.34 \pm 1.09	3.18 \pm 1.10	4.16 \pm 1.25	
	41–50	7.29 \pm 1.13	3.25 \pm 1.12	4.04 \pm 1.30	
	>50	7.20 \pm 1.20	3.10 \pm 1.00	4.10 \pm 1.28	
Gender	Male	7.18 \pm 1.10	3.22 \pm 1.08	3.96 \pm 1.26	0.65
	Female	7.31 \pm 1.13	3.15 \pm 1.05	4.16 \pm 1.29	
Occupation	Service holder	7.35 \pm 1.15	3.25 \pm 1.10	4.10 \pm 1.31	0.79
	Housewife	7.20 \pm 1.09	3.18 \pm 1.02	4.02 \pm 1.28	
	Student	7.10 \pm 1.00	3.00 \pm 1.00	4.10 \pm 1.25	
	Others	7.30 \pm 1.12	3.20 \pm 1.10	4.10 \pm 1.26	

Note: Independent sample *t*-test and ANOVA were used to assess the association. No statistically significant association was found between socio-demographic variables and reduction in pain level ($p > 0.05$).

Table 5 illustrates the functional improvement reported by patients following completion of the physiotherapy sessions. A majority of participants demonstrated marked functional recovery in multiple domains. Specifically, 90.2% of patients experienced improvement in neck movement, and 84.3% reported enhanced ability to perform daily activities such as dressing, household work, and office tasks. Furthermore, 80.4% of participants noted better sleep quality, likely due to reduced discomfort and muscle stiffness. Improvement in work efficiency was also observed among 74.5% of participants, reflecting the positive impact of physiotherapy on overall functional performance and quality of life.

Table 5. Functional Improvement Reported by Patients after Physiotherapy

Functional Outcome	Improved n (%)	Not Improved n (%)
Neck movement	46 (90.2)	5 (9.8)
Ability to perform daily activities	43 (84.3)	8 (15.7)
Sleep quality	41 (80.4)	10 (19.6)
Work efficiency	38 (74.5)	13 (25.5)

DISCUSSION



This study evaluated the effectiveness of physiotherapy in the form of ShortWave Diathermy (SWD) in reducing chronic neck pain and improving functional outcomes among patients attending a tertiary hospital in Bangladesh. Our findings demonstrate that SWD significantly reduced pain intensity and enhanced functional performance, supporting its role as an effective physiotherapeutic intervention for chronic neck pain. The mean VAS score decreased from 7.26 ± 1.12 pre-treatment to 3.18 ± 1.07 post-treatment, representing a clinically meaningful reduction of 4.08 ± 1.29 points ($p < 0.001$). These results are consistent with prior studies demonstrating that deep heat modalities, such as SWD, alleviate musculoskeletal pain by increasing local blood flow, reducing muscle spasm, and promoting tissue healing [12,13].

Functional outcomes improved notably in our cohort. Approximately 90% of patients reported enhanced neck mobility, and over 80% experienced improvements in daily activities, sleep quality, and work efficiency. These observations align with the findings reported that Short Wave Diathermy modalities, including SWD, not only reduce pain but also improve functional capacity and quality of life in patients with chronic musculoskeletal conditions [14,15]. The high proportion of patients experiencing meaningful functional recovery emphasizes the importance of integrating SWD within comprehensive rehabilitation programs.

Interestingly, the effectiveness of SWD did not vary significantly across socio-demographic subgroups, including age, gender, and occupation. This finding suggests that SWD is broadly applicable and beneficial irrespective of patient characteristics, consistent with another study indicating that non-pharmacologic interventions are generally effective across diverse populations [16].

The majority of patients attributed their neck pain to poor posture, prolonged computer use, or occupational strain, reflecting the increasing burden of sedentary lifestyles on musculoskeletal health in Bangladesh. Early ShortWave Diathermy interventions, including SWD, may therefore play a critical role in preventing chronicity, improving function, and reducing reliance on pharmacologic therapies, which carry risks of adverse effects with long-term use [17].

Limitations include the lack of a control or placebo group, short follow-up duration, small sample size, and reliance on self-reported functional outcomes, which may limit generalizability. Despite these constraints, the study provides evidence supporting SWD as a safe and effective option for managing chronic neck pain in ShortWave Diathermy settings.

CONCLUSION

In this study, SWD significantly reduced pain intensity and improved functional outcomes, including neck mobility, daily activity performance, sleep quality, and work efficiency. The therapy demonstrated consistent benefits across age, gender, and occupational groups, highlighting its broad applicability. SWD can be considered a valuable non-invasive intervention for managing chronic neck pain in tertiary hospital settings, either as a standalone treatment or as part of a comprehensive ShortWave Diathermy program.

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