

A Study to assess the Effectiveness of Isometric Exercises on Cervical Spondylitis Patients in Selected Hospital at Kanpur, U.P.

Mandeep Kumar Singh¹, Niladrita Deb²

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ABSTRACT

This study, titled “A Study to assess the Effectiveness of isometric exercises on cervical spondylitis patients in selected hospital at Kanpur, UP” aimed to determine the impact of isometric exercises on patients. A pre-experimental, one-group pretest-post-test design was employed, involving 60 cervical spondylitis patients meeting inclusion criteria, selected through purposive sampling. The study utilized structured socio-demographic variables and a numeric pain assessment scale. The results showed a significant reduction in pain levels after isometric exercises, with an overall mean difference of 15.8. Initially, 41 patients (68.3%) reported moderate pain, 12 (20%) severe and 7 (11.7%) mild pain. Post-intervention, 51 patients (85%) reported mild pain, and 9 (15%) moderate pain, with no cases of severe pain. The ‘t’ test value exceeded the tabulated value at a 0.05 significance level, leading to the acceptance of the H1 hypothesis. The study concluded that isometric exercises were effective in reducing pain levels among cervical spondylitis patients.

Keywords: Cervical spondylitis; Pain; Patients.

INTRODUCTION

Any deterioration of the spinal column is known as spondylosis. The most prevalent cause of spondylosis, spinal osteoarthritis, is the age-related deterioration of the spinal column. In a

more restricted sense, it refers to this condition. The spinal column, neural foramina, and facet joints are the primary targets of osteoarthritis’ degenerative process (facet syndrome). In its most severe form, it may compress spinal cord or nerve roots, leading to a cascade of the sensory or motor problems such numbness, paresthesia, imbalance, and weakened limb muscles.¹

Compression of a nerve root originating from the spinal cord may cause radiculopathy (sensory and motor abnormalities, including acute pain in the neck, shoulder, arm, back, or leg, along with muscular weakness) when the space between two neighboring vertebrae narrows. Myelopathy, a condition defined by weakness, gait dysfunction, imbalance, and loss of control over one’s bowels or bladder, may occur less often as a consequence of direct pressure on the spinal cord, usually in the

Author’s Affiliation: ¹Assistant Professor, ²Associate Professor, Department of Nursing, SAAII College of Medical Science & Technology, Mariyani 209203, Uttar Pradesh, India.

Correspondence Author: Niladrita Deb, Associate Professor, Department Nursing, SAAII College of Medical Science & Technology, Mariyani 209203, Uttar Pradesh, India.

Email: mandy03oct@gmail.com

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cervical spine. Shocks (paresthesia) in the limbs are a possible symptom of nerve compression and reduced blood flow that the patient may encounter. A condition known as cervical spondylosis occurs when the neck vertebrae are affected. The condition known as lumbar spondylosis affects the lower back.²

Initially, a patient with cervical spondylosis may appear with diffuse of neck discomfort and stiffness. The illness may worsen over time, causing symptoms including radiculopathy (when the exiting spinal nerve is compressed by a shortened intervertebral foramen) or myelopathy (when the spinal cord is compressed). Upon physical examination, the most common objective finding is a decreased neck range of motion.³

The gold standard for diagnosing radiculopathy and myelopathy is magnetic resonance imaging (MRI). Spinal ligaments, intervertebral foramen, spinal canal, disc degeneration/herniation, spinal alignment, and spinal cord alterations may all be clearly seen using MRI. Many cervical spondylosis therapies lack enough evidence from randomized, controlled studies. When conservative treatment for cervical radiculopathy fails to alleviate persistent discomfort, worsening symptoms, or weakness, surgical intervention may be considered. Although opinions vary on whether surgery is necessary for cervical spondylosis with myelopathy (CSM), "the majority of clinicians advise surgical intervention rather than conservative treatment for moderate to severe myelopathy."⁴

Restoring mobility, flexibility, and core strength may be possible with physical therapy. Potentially helpful in pain relief are decompressive treatments, such as mechanical traction and manual mobilization. Despite this, osteopathy and physical therapy cannot "cure" degeneration, and others believe that in order to get the most out of decompression, adjustments, and flexibility rehabilitation, one must strictly adhere to postural correction. The current surgical treatments for spondylosis try to lower spinal canal pressure (decompression surgery) or control spine movement (fusion surgery) in order to alleviate symptoms, but there isn't a ton of evidence to back up all of these claims.⁵

Need for study

Degenerative alterations begin in the intervertebral discs of cervical spondylosis, which may lead to the production of osteophytes and

the involvement of nearby soft tissue structures. The line between normal ageing and illness is difficult to determine since many persons over the age of 30 exhibit comparable anomalies on plain radiographs of the cervical spine. Neck discomfort, stiffness, or neurological problems may result from even the most severe degenerative changes, which are often asymptomatic. Cervical spondylosis diagnosis and the existing data for various therapies will be my main points. I will also touch on a few doable steps that are crucial in theory but have received little academic attention. While some individuals may have been included in therapeutic research, specific diseases such as fibromyalgia, disc prolapse, and whiplash will not be taken into consideration.⁶

The course of action for neck pain depends upon its origin; nevertheless, in most cases, the discomfort subsides within a few days or weeks; still, it is possible for the pain to return or even become chronic, lasting more than three months. Eleven percent of the persons surveyed in the United Kingdom reported experiencing neck discomfort; when queried again a year later, fifty-eight percent of those with symptoms said that they were still in pain. Once pain becomes chronic, the outcome is difficult to predict since prognosis and the variables that affect it vary significantly. The quality of most research is low, and reports on the relevance of characteristics such as age, sex, profession, psychological factors, and radiological results are contradicting. The intensity of the initial pain and the presence of concurrent back pain were the strongest indicators of an unfavorable outcome one year following presentation with neck pain, according to three recent studies (1535 patients). Although other studies have shown much higher rates, at least 10% of those who are impacted have persistent neck discomfort. Neck problems cause just as much lost productivity in certain fields as low back discomfort does. Five percent of those who have neck discomfort will be severely disabled as a result. The researcher chose to test an intervention for cervical spondylosis pain relief based on the aforementioned and on personal experience gained during clinical posting.⁷

Problem Statement

A Study to assess the Effectiveness of isometric exercises on cervical spondylitis patients in selected hospital at Kanpur, U.P.

OBJECTIVES

Objectives of the study are:

1. To assess the pain before practicing isometric exercises on cervical spondylitis patients.
2. To teach isometric exercises to cervical spondylitis patients.
3. To assess the pain after practicing isometric exercises on cervical spondylitis patients.
4. To find the effectiveness of isometric exercises on cervical spondylitis patients.
5. To find the significant association between pretest pain and their socio-demographic variables.

Hypothesis

H₁: There will be a significant difference between pretest pain and the posttest pain.

H₂: There will be a significant association between pretest pain and their socio-demographic variables.

Assumptions

This study assumes that:

1. Isometric exercises help to reduce the pain caused by the cervical spondylitis.
2. Patients has poor knowledge on Isometric exercises.

Operational Definitions

Assess: In this study it explains that to find the level of pain due to cervical spondylitis.

Effectiveness: In this study it implies that the outcome of the isometric exercises on cervical spondylitis.

Cervical spondylitis: In this study it is a general term for age-related wear and tear affecting the spinal disks in the neck among the patients in selected hospital at Kanpur.

METHODOLOGY

This study adopted a quantitative research approach, utilizing a pre-experimental one-group pre-test and post-test design relevant to naturally occurring situations, carried out at Madhuraj Hospital (P) Ltd., Kanpur, accommodating over 500 patients. The research assessed the impact of isometric exercises (independent variable) on pain

among Cervical Spondylitis patients (dependent variable). Cervical Spondylitis patients at the hospital formed the population, with purposive sampling selecting 60 patients meeting inclusion criteria - understanding Hindi/English, willingness to participate, and presence on the data collection day - excluding those who participated in similar studies or had other health issues. Data collection tools included socio-demographic sections with items covering age, gender, education, occupation, illness duration, family history of cervical spondylitis, and hospitalization duration. Ethical considerations involved obtaining prior permission from the hospital and participants, with no ethical issues arising during the study. A pilot study assessed the feasibility and provided information for project improvement, conducted from 05-04-2023 to 20-04-2023, showing that the tool was feasible and understandable for participants. Formal written permission was obtained from Madhuraj Hospital (P) Ltd., Kanpur, for data collection.

RESULTS

Table 1: Frequency and percentage distribution of sociodemographic variables of the respondents

n=60		
Socio-demographic Data	Frequency	Percentage
Age in years		
41 to 45 years	25	41.7%
46 to 50 years	13	21.7%
50 to 60 years	22	36.7%
Gender		
Male	30	50.0%
Female	30	50.0%
Education		
Illiterate	10	16.7%
Basic education	16	26.7%
Secondary educaion	10	16.7%
Higher education	14	23.3%
Graduate	10	16.7%
Occupation		
No job	14	23.3%
Private job	16	26.7%
Government job	8	13.3%
Daily wages	15	25.0%
Business	7	11.7%
Duration of illness		
Less than one year	15	25.0%

Table Cont...

One year to 3 years	25	41.7%
More than 3 years	20	33.3%
Family history of cervical spondylitis		
Yes	19	31.7%
No	41	68.3%
Duration of hospitalization		
Less than one day	39	65.0%
One day to three days	15	25.0%
More than three days	6	10.0%

The above table implies the following

The age distribution among the samples shows that 41.7% are aged between 41-45 years, 36.7% are between 50-60 years, and 21.7% are between

46-50 years. There is an equal gender distribution with 50% male and 50% female. Educational levels include Basic education for 26.7%, Higher education for 23.3%, while Illiterate, Secondary, and Graduate education each account for 16.7%. Regarding occupation, 26.7% work privately, 25.0% are on daily wages, 23.3% have no job, 13.3% hold government jobs, and 11.7% are in business. The duration of illness varies, with 41.7% affected for 1-3 years, 33.3% for more than 3 years, and 25.0% for less than 1 year. A family history of cervical spondylitis is absent in 68.3% of the samples, and present in 31.7%. Hospitalization duration is less than 1 day for 65.0%, between 1-3 days for 25.0%, and more than 3 days for 10.0%.

Table 2: Comparison of maximum score, mean, standard deviation and mean percentage of pain before and after practicing isometric exercises scores of samples

Knowledge aspects	No of items	Pre-test				Post-test				Mean difference
		Max. Score	Mean	SD	Mean %	Max. Score	Mean	SD	Mean %	
Pain level	1.0	10.0	5.4	2.1	53.8	6.0	2.3	1.4	38.1	15.8

The overall mean difference in the pain level before and after practicing isometric exercises scores of samples is 15.8.

Table 3: Comparison of pain level before and after practicing isometric exercises scores of samples

Knowledge levels	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Mild pain	7	11.7	51	85.0
Moderate pain	41	68.3	9	15.0
Severe pain	12	20.0	0	0.0

Before practicing isometric exercises due to cervical spondylitis, 68.3% of samples experienced moderate pain, 20.0% had severe pain, and 11.7% reported mild pain. After practicing isometric exercises, 85.0% of samples reported mild pain,

15.0% had moderate pain, and none experienced severe pain. Notably, the number of samples with mild pain increased from 11.7% in the pretest to 85% in the post-test.

Section 3: Analyses the effectiveness of isometric exercises on cervical spondylitis patients

Table 4: Effectiveness of isometric exercises on cervical spondylitis patients

Knowledge aspects	Test	Mean	SD	t-value	Significance
Pain level	Pre-test	5.38	2.08		
Pain level	Post-test	2.30	1.40	9.42	P<0.05; NS

S=Significant

The above table depicts that the calculated 't' value is higher than the tabulated value at 0.05 level of significance. So, the H_1 hypothesis is accepted. The researcher concluded that the isometric

exercises was effective.

Section 4: Analysis of the association between pretest pain and their socio-demographic variables

Table 9: Association between pre-test pain and their sociodemographic variables

Sociodemographic Data	<median	>median	Total	df	Chi-Square	Table Value	Inference
n=60							
Age in years							
41 to 45 years	15	10	25				
46 to 50 years	8	5	13	2	12.16	5.991	P<0.05 S
50 to 60 years	9	13	22				
Gender							
Male	12	18	30				
Female	20	10	30	1	4.29	3.841	P<0.05 S
Education							
Illiterate	5	5	10				
Basic education	7	9	16				
Secondary education	6	4	10	4	0.88	9.488	P>0.05 NS
Higher education	7	7	14				
Graduate	7	3	10				
Occupation							
No job	7	7	14				
Private job	9	7	16				
Government job	3	5	8	4	0.92	9.488	P>0.05 NS
Daily wages	8	7	15				
Business	5	2	7				
Duration of illness							
Less than one year	5	10	15				
One year to 3 years	15	10	25	2	3.21	5.991	P>0.05 NS
More than 3 years	12	8	20				
Family history of cervical spondylitis							
Yes	9	10	19				
No	23	18	41	1	0.40	3.841	P>0.05 NS
Duration of hospitalization							
Less than one day	23	16	39				
One day to three days	5	10	15	2	3.34	5.991	P>0.05 NS
More than three days	4	2	6				

The above chi-square table explains that there is a significant association between pain level and the sociodemographic variables such as age in years and gender as the chi-square value are higher than the table value at 0.05 level of significance.

DISCUSSION

The findings of this study provide compelling evidence on the efficacy of isometric exercises in managing pain among cervical spondylitis patients. The significant reduction in pain levels observed post-intervention underscores the potential of such non-pharmacological

interventions in improving patient outcomes. The results align with previous studies suggesting that isometric exercises can strengthen neck muscles, enhance stability, and reduce pain levels. For instance, a study by [Author *et al.*, Year] demonstrated similar outcomes, highlighting the role of muscle strengthening in alleviating cervical spine-related pain. Given the high prevalence of cervical spondylitis and the chronic nature of the pain associated with it, this study's findings are particularly valuable. Health practitioners may consider incorporating isometric exercises into routine treatment plans for cervical spondylitis patients. This could help reduce reliance on

medications and their associated side effects. A significant point of the study is the use of a structured pretest-posttest design, which offers robust evidence of the effectiveness of the intervention. However, the study's limitations should be acknowledged. The sample size was relatively small and confined to a single hospital, potentially limiting the generalizability of the findings. Additionally, the lack of a control group means that other factors influencing pain reduction cannot be entirely ruled out. Future studies with larger, randomized samples and control groups would provide more definitive evidence.

CONCLUSION

The study concluded that isometric exercises significantly reduced pain levels in cervical spondylitis patients at a selected hospital in Kanpur, U.P. This finding supports the effectiveness of isometric exercises as a treatment for managing pain in cervical spondylitis, as evidenced by the substantial decrease in pain levels post-intervention. The statistical analysis affirmed the validity of these results, indicating the potential benefits of incorporating isometric exercises into the treatment regimen for cervical spondylitis patients.

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