

EFFECTIVENESS OF CRYOTHERAPY AND COMPRESSION THERAPY IN UNDERGRADUATE STUDENTS IN TENSION TYPE OF HEADACHE.

Dr.Nandini B. Kadabi^{1*}, Bheemappa Pujar², Basamma Hooli³, Bhairavi Honnavarkar⁴

¹MPT, PhD, Professor, Dr. Ravi Patil Institute of Physiotherapy

^{2,3,4}BPT Scholar, Dr. Ravi Patil Institute of Physiotherapy

Dr. Ravi Patil Institution of Physiotherapy, Belagavi, India.

*Corresponding Author: principal.physiotherapy.drpi@gmail.com

DOI: <https://doi.org/10.63299/ijopt.0060474>

ABSTRACT

Background: Tension type of headache formerly called tension muscle contraction headache is a common condition usually is self-treated with over the counter (OTC) analgesics.

Objective: 1. To study the Effectiveness of cryotherapy and compression therapy in undergraduate students with tension type of headache. 2. To study of Effectiveness of cryotherapy in undergraduate students in tension type of headache 3. To study of Effectiveness of compression therapy in undergraduate students in tension type of headache results being statistically significant.

- HIT: Performance scores improved in both groups, again reaching statistical significance with CRYO showing a greater effect.

The statistical significance of each result was confirmed with p-values as follows:

- VAS: $p < 0.00001$ (significant)
- 4Point: $p \approx 0.00001$ (significant)
- HIT: $p < 0.00001$ (significant)

Method: In this experimental study, total 40 number of students were recruited in the study including tension type of headache perceived cryotherapy and compression therapy treatment over 4 week duration, with treatment sessions conducted three times weekly. The outcomes assessed were pain intensity using verbal analogue scale , Headache impact test,4 point scale

Result: 1.VAS: Both interventions significantly reduced pain, with CRYO producing a larger average reduction than COMPRESS. 2.4Point: Functional improvements were significant in both groups, with similar average benefits and all results being statistically significant. 3.HIT: Performance scores improved in both groups, again reaching statistical significance with CRYO showing a greater effect.)

Conclusion: Based on the results, It can be conclude that cryotherapy is more effective than the compression therapy.

Keywords: Tension type of headache, Cryotherapy, compression therapy, VAS, HIT, 4 point scale

INTRODUCTION:

Tension type of headache formerly called tension muscle contraction headache is a common condition usually is self-treated with over the counter (OTC) analgesics. The general classification of ICHD depends on there aetiologies ,which are: Infrequent episodic TTH, Frequent episodic TTH, Chronic episodic TTH, TTH can be specific or non-specific.

Specific tension type of headache is the pain that is caused by a increased muscle tension in the head, neck, shoulder muscle or when the pain radiates from another part radiates from another part of the head.

Non-specific tension type of headache is when it isn't possible to identify a specific disease or structural response to explain the pain.

Among the various types of TTH, non-specific tension type of headache is most common. According to World Health Organization (WHO) TTH is a primary headache disorder means it is not caused by another condition (no underlying structural or systemic disease causing in the headache).

The signs and symptoms of non-specific TTH might be related to strain which may be mechanical in nature like strenuous sports activities or psychological and social stressors like job dissatisfaction although it can develop spontaneously. The leading causes of TTH include attaining or having lifestyle and behavioral while increase the tension or the stiffness in pericranial muscle. Tension type of headache is one of the common concerns of the entire world. It affects almost ninety percent of the population around the globe at any point during their lifetime although more than half of the population have more than one episode of pain.

ETIOLOGY:

- 1.Prolonged posture.
- 2.Academic stress.
- 3.Anxiety and depression.
- 4.Emotional exhaustion.
- 5.Lifestyle factors.
- 6.Irregular sleep patterns.
- 7.Dehydration.
- 8.Lack of relaxation.
- 9.Mental Distress.

OBJECTIVE

The purpose of this study was to explore the therapeutic effectiveness of cryotherapy and compression therapy in undergraduate students with tension type of headache.

MATERIALS AND METHODS

METHOD:

- 1.Study type-Experimental study.
- 2.Source of collection of data-Data was collected from undergraduate students.
- 3.Sample size-40Subjects.

MATERIALS:

- 1 Equipment
- 2.Medical bed.
- 3 Stopwatch.
- 4.Compression therapy band.
- 5.Icepacks

Inclusion criteria :

- 1.History of chronic headache.
- 2.Bilateral location.
- 3.Pressing/tightening quality.

- 4.Mild or moderate intensity.
- 5.Nausea.
- 6.Photophobia.
- 7.Absence of aggravation by routine physical activity.
- 8.Phonophobia.
- 9.Peri cranial tenderness.
- 10.Radicular Syndrome.

Exclusion criteria:

- 1.Subject with non-specific tension type of headache.
- 2.- Age -18 to 24.
- 3.Gender –Female and male.
- 4.Tension type of headache pain more than 2weeks.
- 5.Randomised controls trails

INTERVENTION:

This experimental study used a pre-test and post -test design.Before starting the procedure, written informed consent was obtained from all the participants. Individuals who agreed to participate in daily intervention for four weeks were enrolled in the study.The cryotherapy and compression therapy treatment was administered, with each therapy comprises of duration 15 to 20 minutes.

ISSN: 2321-5690

THE EXERCISE PROTOCOLS AREA FOLLOWS:

A) CRYOTHERAPY:

The subjects of the study were informed about the therapeutic uses of locally applied coolants at the back of neck and its effects in reducing TTH. Conduction occurs when a cool ice compress is applied at the back of neck. As cooling decreases tissue temperatures, the sensory nerves in the skin are provoked to fire continuously until physiologically exhausted.

Cryotherapy is most commonly applied as an ice pack which may be created by putting ice in plastic bag or by freezing a moistened hydrocollator. A damp towel should be frozen. The towel is then placed over the treatment site for 10 to 15 minutes or until sensory analgesia of the skin is produced.

B) COMPRESSION THERAPY: AN INTERNATIONAL JOURNAL

Compression therapy for headaches is considered an adjunctive method—it helps by giving gentle pressure, reducing muscle tension, and providing a “supportive” feeling. It should not be overly tight, as this may worsen pain or restrict blood flow.

Explain the procedure to the patient. Make the patient sit or lie comfortably with the head supported. Use a soft elastic/compression bandage (5–10 cm width). Check that the bandage is clean and dry. Start at the forehead just above the eyebrows. Wrap the bandage around the head circumference (forehead → above ears → back of head → forehead). Apply firm but gentle pressure—enough to provide compression without restricting circulation or causing discomfort.

Overlap each turn by half the width of the bandage. If needed, use a figure-8 pattern (around head and under occiput). Secure the end with tape, clips, or a knot at the side (not on a pressure point). Check patient comfort (ask if band feels too tight). Ensure eyes, ears, and airway are free. Observe for dizziness, increased pain, or skin color changes—loosen if needed.

OUTCOME MEASURES

A) PAIN- Visual analogue scale (VAS) will be used to assess pain. 10-point scale ranging from 0 to 10. It is used to measure the intensity of pain where, 0 score is no pain and 10 score is the higher intensity.

B) HEADACHE IMPACT TEST (HIT) This questionnaire was designed to help you describe and communicate the way you feel and what you cannot do because of headache.

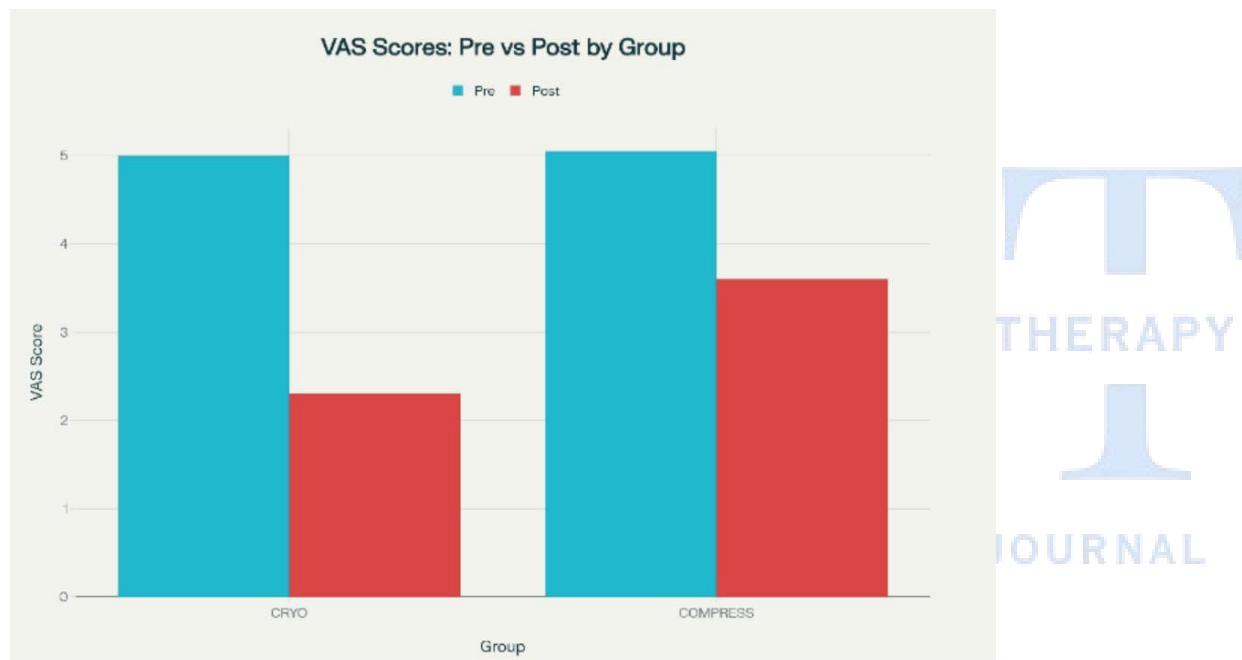
C) 4 POINT scale

RESULT:

Table 1: Comparison between the groups

Group	Measure	Mean Pre	Std Pre	Mean Post	Std Post	t-Statistic	p-value	significant
Cryo	VAS	5.00	1.72	2.3	1.53	13.08	0.00000	Yes
Compress	VAS	5.05	1.61	3.6	1.5	9.45	0.00000	Yes
Cryo	4 Point	1.8	0.7	1.05	0.51	6.1	0.00001	Yes
Compress	4 Point	1.8	0.62	1.1	0.31	6.66	0.00000	Yes
Cryo	HIT	54.95	5.56	43.9	6.21	9.28	0.00000	Yes
Compress	HIT	56.05	4.37	51.55	4.36	10	0.00000	Yes

Graph 1: demonstrates that there was a difference between pre and post readings of

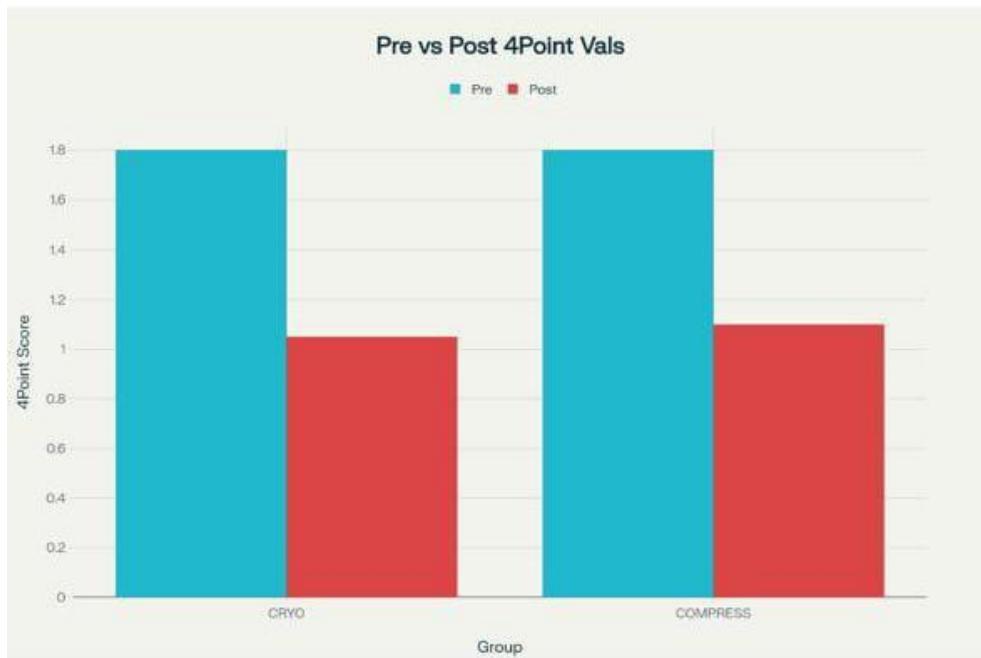


Group,Pre-Treatment VAS Score (Blue Bar),Post-Treatment VAS Score (Red Bar),Change (Pre - Post)

CRYO, \approx 5.0, \approx 2.0,Significant decrease (Improvement)

COMPRESS, \approx 5.0, \approx 3.8,Moderate decrease (Improvement)

Graph2: Demonstrates that there was a difference between HIT Pre vs Post by group

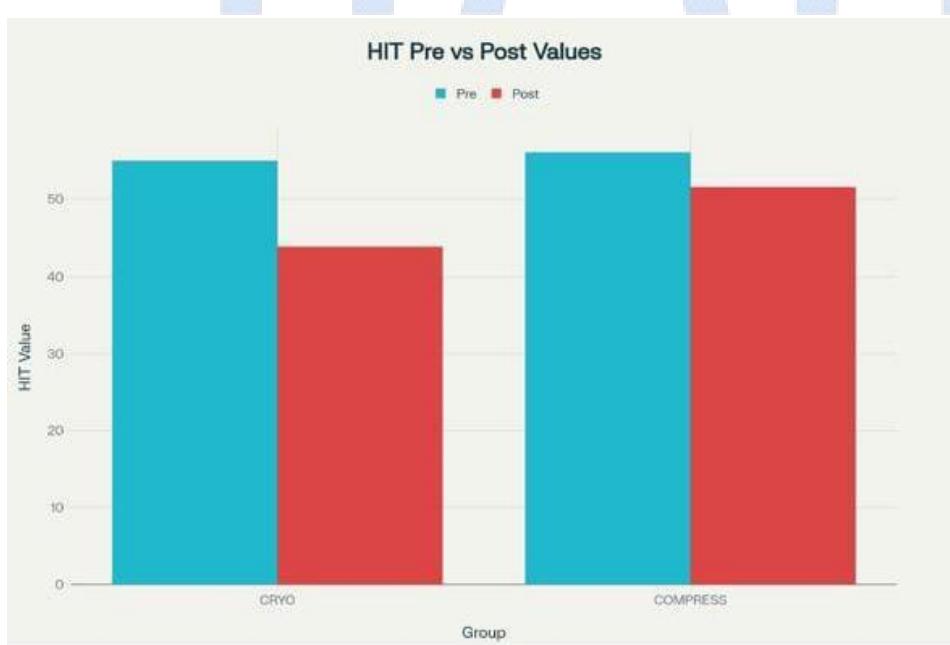


Group,Pre-Treatment 4Point Score (Blue Bar),Post-Treatment 4Point Score (Red Bar),Change (Pre - Post)

CRYO, $\approx 1.7, \approx 1.0$,Significant decrease (Improvement)

COMPRESS, $\approx 1.7, \approx 1.1$,Significant decrease (Improvement)

Graph3: Demonstrates that there was a difference between pre and post readings in Cryotherapy and Compression therapy.



Group,Pre-Treatment HIT Value (Blue Bar),Post-Treatment HIT Value (Red Bar),Change (Pre - Post) CRYO,

$\approx 51, \approx 43$,Decrease of ≈ 8 COMPRESS, $\approx 51, \approx 49$,Decrease of ≈ 2

DISCUSSION:

Effectiveness of Cryotherapy and Compression Therapy in Undergraduate with tension type of headache
This study investigated the intensity and frequency of tension-type headaches in patients with this condition. The study included a collected sample of 40 students from Dr. Ravi Patil institute of Physiotherapy, among these, 20 received cryotherapy and 20 received compression therapy. The findings showed a significant reduction in the severity of headache after both interventions, indicating that non-pharmacological physical therapies can play an effective role in the management of tension-type headaches among young adults.

Overview

Before interventions, most participants reported moderate to severe headache intensity, often associated with academic stress and poor posture. Factors commonly observed in university students. After intervention, both cryotherapy and compression therapy showed notable improvements, with decreased pain intensity, frequency of episodes, and muscle tightness in the neck and shoulder regions.

Effectiveness of Cryotherapy and Compression Therapy

Effectiveness of Cryotherapy:

Cryotherapy demonstrated a marked reduction in pain scores among participants. The application of cold packs to the posterior neck likely reduced local muscle spasm and nerve conduction velocity, leading to pain relief. Cold pack application to the posterior neck region showed immediate relaxation and improved concentration.

Effectiveness of Compression Therapy:

Compression therapy also produced a significant decrease in pain intensity and muscle tightness among the participants. The gentle pressure applied to the head may have stimulated cutaneous mechanoreceptors, which modulate pain transmission through the gait control theory, thus producing improved blood circulation and reducing pain in precranial muscles.

Comparison between Therapies

When comparing both interventions, cryotherapy provided faster short-term relief, while compression offered more sustained relaxation and comfort over time.

ISSN: 2321-5690

Implications:

Undergraduate students frequently experience tension-type headaches due to academic stress and prolonged study postures. The current findings suggest that cryotherapy and compression therapy are simple, affordable, safe, and effective interventions for managing these headaches.

CONCLUSION:

In conclusion, the analysis provides compelling empirical evidence for the efficacy of both CRYO and COMPRESS interventions, with CRYO generally offering greater clinical improvement. The highly significant p-values and consistent findings across all measures support the reliability of these outcomes, and the use of proper statistical methods ensures that these conclusions are both scientifically and clinically valid.

REFERENCES:

- 1.Evaluating Migraine Disability: The headache impact test Instrument in context - William Pryse Philips.
- 2.Exploring Cryotherapy as therapeutic approaches for stress - Induced tension headache in college students - Mona Hassan Abdelaal.
- 3.Cryotherapy in tension headache analysis of the frequency of symptoms – Hellen Cristina Foralona, Janaina lira, Juliana Ramos, Morgana Neves, Jose luiz Marinho.
- 4.Modifications of therapeutic temperature range in Cryotherapy could improve clinical efficacy in Tension type of headache.
- 5.Effectiveness of physiotherapy intervention on headache intensity, frequency, duration and quality of life of patient with tension type of patient with tension type of headache, A systematic review and network meta-analysis – Andres jung, Robert -Christopher Eschke and Kerstein Luedtke.
- 6.Measuring Health -related quality of life in chronic headache: A Comparative evaluation of the chronic headache quality of life questionnaire and headache impact test (HTR)6 – Kirstie L Haywood , Felix A chanana.
- 7.Needle Acupuncture in tension type headache:A randomized,Placebo controlled study – M Karit M Reinhard ,M Fink ,P Thum,B Wiex ,J -Rollnik,M Fink.
- 8.Migraine, Tension type of headache and depression among Saudi female students in Taif University – Dalla E ,Desouky ,Hany A Zaid and Azza Afha.
- 9Effects of Concurrent application of taping and Ischemic Compression therapy on cervical Function,pain ,and Muscle Characteristics in Myofascial pain syndrome – Yun -ho jung,Tac -lim- yoon.

10.Primary headache attribute to external compression or traction to the head : A narrative review – Ole Hensel Torsten Karya.

11.Tension type headache: A life course review Karen E waldie ,Jude Buckley Peter N Bull Richu Poulton.

12.The International classification of headache disorders.

ISSN: 2321-5690

