



(REVIEW ARTICLE)



Effect of strengthening rehabilitation exercises on cervicogenic headache: A review of literature

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Abstract

Background: Cervicogenic headache (CGH) is common headache type that arises in the neck and is frequently accompanied with stiffness and discomfort in the neck. It has been demonstrated that strengthening rehabilitation activities are useful in lowering pain and impairment in people with CGH.

Objective: The aim of the study was to ascertain the impact of strengthening rehabilitation exercises on the level of pain, neck impairment, and quality of life of CGH patients.

Methods: Randomized controlled trials (RCTs) were the subject of an organized review. Digital databases were combed for RCTs published from inception to 2024. Studies that evaluated the impact of strengthening rehabilitation exercises on intensity of pain, neck disability, and quality of life in individuals with CGH were included.

Results: Strengthening exercises have positive results on cervicogenic headache.

Conclusion: For individuals suffering from CGH, strengthening rehabilitation exercises can be beneficial for decreasing pain intensity, reducing neck disability, and improving quality of life. Clinicians seek to think about such physical activity in the therapy regimen for CGH patients. In order to verify these results and establish the ideal exercise criteria, further reliable research is required.

Keywords: Cervicogenic headache; Muscle weakness; Mobilization; Manipulation

1. Introduction

A form of headache called a cervicogenic headache (CGH) comes from the neck or cervical spine. According to estimates, CGH accounts for between 15% and 20% of all occurrences of chronic headache, making it a serious public health issue. Pain that is commonly unilateral and radiates from the neck to the head characterizes CGH and frequently resembles tension-type headaches or migraines. It is linked to neck stiffness and soreness, restricted neck motion, and muscular imbalances in the cervical area. Exercises for rehabilitation have been proven to be a successful therapeutic strategy for CGH management. Particularly strengthening activities have been suggested as a viable intervention to enhance the stability and function of the cervical spine, which may help with the management of CGH. Several treatment protocols should be followed, including pharmacotherapy, joint injections, nerve blocks, and injections into the atlantoaxial and (C2-C3) zygapophyseal joints. When conservative treatment has failed to provide relief from a persistent cervical headache caused by the (C2-C3) zygapophyseal joint, it is advised to employ radio frequency for minimally invasive interventional care.^[1-2] Although there are many interventions used to treat cervicogenic headaches, including massage, exercise therapy, and strengthening exercises. A rolled-up towel is placed behind the neck when performing several

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strengthening exercises, such as the craniocervical flexion exercise. It aids in relieving pain. By placing a hand on the forehead and attempting to push it against the hand, flexion and extension exercises are effective for strengthening the neck muscles. Exercises for rotation are performed while standing or sitting upright and turning the head to the right while looking over the shoulder. Exercises that involve lateral flexion serve to build up the muscles by using the hands as a kind of resistance against the temple.^[3] In the chin-tuck exercise, which can be performed while standing or sitting, the shoulder is gently moved backward while the chin is tucked down towards the chest. Exercises for strengthening the shoulder blades include sitting and standing with the hips straight, avoiding forward or backward bending, and performing the exercise after taking several deep breaths. Next, raise your arms so they are at your elbows, and hold that position for up to two minutes. The precise effects of strengthening rehabilitation activities on CGH, however, are not well studied. This evaluation of the literature's purpose is to find out how strengthening rehabilitation activities affect CGH.

2. Methodology

Multiple databases and search engines were used, which were Google scholar, research gate, PubMed to search the relevant articles between 2015-2022. The specific terms used in combination and isolation were "Strengthening Rehabilitation Exercises on Cervicogenic Headache". "Strengthening Exercises on Cervicogenic Headache".

Additional pertinent articles were looked up in the reference lists of the articles found through this search. Studies were either included or excluded depending on their possible applicability to the Strengthening exercises.

3. Review of Literature

According to various studies done on the "Effect of Strengthening Rehabilitation Exercise on Cervicogenic Headache in Adults." It was found in a study done on the A randomized controlled experiment found that spine mobilization and posture-correction exercises can successfully treat cervicogenic headache.^[4] Another study conducted on The Treatment of Cervicogenic Headache with Physical Therapy and the Effect of Adding Dry Needling: A RCT concluded that dry needling improves patients with cervicogenic headaches' cervical range of motion (ROM), deep cervical flexor muscle function, and activated trigger points.^[5]

In a research, individuals with CGH were given exercise, mobilisation, and manipulation of the upper cervical and upper thoracic regions. According to the findings of the multi-center randomized clinical research, patients with Cervicogenic Headache (CGH) reported mobilization and exercise to be less beneficial after 6–8 intervals of manipulation of the upper thoracic and cervical spine, and the advantages continued after 3 months.^[6] Another study, the Impact of Suboccipital Myofascial Release Technique on Cervical Strength of Muscles of individuals with CGH, found that, when compared to pre-treatment results, both exercise and Myofascial Release (MFR) groups significantly enhanced cervical muscular strength after 10 treatment sessions, particularly in the right and left rotators. Exercise groups results in muscular strength for the flexors, rotators, and lateral flexors were more significant than MFR group results.^[7]

A further investigation that looked at the direct Impact of Upper Cervical Translatory Mobilisation on Pain Intensity and Cervical Mobility in individuals with CGH suggested that this procedure increased range of motion (ROM) in the upper cervical region and appeared to enhance ROM throughout the entire cervical region.^[8] Additionally, a dual-center RCT on the Spinal manipulation's dose-response and therapeutic effectiveness of CGH found that SMT visits and days with CGH had a linear dose-response relationship. When compared to the light-massage control, CGH days were cut in half and around 3 additional days per month for the maximum and most effective dosage of 18 SMT sessions.^[9]

Further a study conducted on the single-blinded, placebo-controlled study of chiropractic spine manipulation for headaches caused by the cervicogenic headache, RCT suggested that both the chiropractic spinal manipulation treatment and the placebo groups, the frequency of headaches decreased over the course of the treatment. The headache index was higher across the board for the chiropractic spinal manipulation treatment group. For patients with cervicogenic headache, physical treatment may be a secure alternative therapy.^[10] Additionally, a study entitled "Comparative Results in Cervicogenic Headache of Mulligan's Mobilization, Spinal manipulation, and Traditional Therapeutic massage Therapy—A Prospective, RCT" found that Mulligan's mobilization using the Sustained Natural Apophyseal Glides (SNAG) technique was more successful than spinal manipulation treatment and typical use of massage treatment for the CGH.^[11]

An investigation done on the Thoracic spine and thrust manipulation for people with CGH: a RCT suggested that TSM had no impact on the impairment caused by headaches. Future research is required to look into TSM's long-term effects

on this population. It significantly reduced neck-related disability and the participant felt better.^[12] Furthermore, in a study done on the Exercise combined with practical manipulation rather than mobilisation of the higher portions of the cervical spine used to treat cervicogenic headaches: a RCT concluded that when used pragmatically for patients with cervicogenic headaches, Identical to mobilisation, manipulation additionally enhanced cervical range of motion and reduced disability, pain, and GRC.^[13]

A study conducted on the outcome of cervical traction versus strengthening exercise in patients of radiculopathy in the cervical region: a RCT, that the application of manual traction is better than strengthening exercise to reduced pain and disability.^[14] Another study conducted on the Benefits of cervicospinal exercises on increasing cervical range of motion, lowering neck discomfort, and helping individuals with cervicogenic headaches, that exercise strengthening the cervical scapula are less successful at reducing neck discomfort and improving cervical range of motion.^[15] Another study conducted on the cervicogenic headache prevention by spinal rehabilitation exercise or manual therapy on adults, that manual treatment is more efficient than spinal rehabilitative in decreasing intensity of headache pain and duration.^[16]

Another study conducted on the Patients with cervical radiculopathy getting benefitted from mechanical traction combined with neural mobilisation since it is more successful at easing neck discomfort and restoring function.^[17] Another study conducted on the Effects of mobilization versus strength training in patient with chronic CGH, that strength training is more effective than mobilization in improving functional ability and to reduce pain.^[18] Another study conducted on the Outcomes of neck stabilising exercise and transcranial direct electrical stimulation on muscle characteristics and function in individuals with CGH, demonstrating that both are successful in decreasing cervical muscle tone and improving the movement to minimize the muscle stiffness and neck disability.^[19]

Furthermore, in a study done on the Effects of upper cervical spine manual treatment coupled with exercise vs standalone exercise on individuals with cervicogenic headache over the short- and medium-term. A RCT suggested that for patients with CGH, four 20-minute manual therapy sessions with an exercise protocol in addition with exercise regimen at home is more beneficial in the long and short terms than merely a home workout routine and an exercise programme.^[20] Another investigation into the treatment of cervicogenic headache patients included spinal manipulation and perineural electrical dry needling. The results of this multicenter RCT showed that electrical dry needling and high-velocity, low-amplitude thrusts are more effective in treating CGH patients than non-thrust mobilization and exercise, and the effects persisted after three months.^[21] Yet another study was done on the Does sagittal cervical alignment correction reduce cervicogenic headache discomfort and disability. A 2-year pilot RCT, concluded that in terms of the outcomes demonstrated feasibly in terms of compliance rate, recruitment rate, safety, adherence to exercise sessions, and overall satisfaction. The inclusion of the Denneroll orthotic device showed favorable impact on the results of CGH management at 1- 2-year follow-up.^[22] Another study done on the Effect of Mulligan upper cervical manual traction on cervicogenic headache therapy: a RCT concluded that MUCMT is a successful treatment for CGH patients, especially in terms of upper cervical rotation range of motion.^[23]

A study conducted by (Sana Tahir, 2022) on the impact of cervical traction versus strengthening exercise in patients of radiculopathy in the cervical region: a RCT, that manual traction is more efficient than strengthening exercise to reduced pain and disability ¹⁴. Another study conducted by (Anum Manzoor, 2021) on the impact of exercises of the cervicospinal region and improving in cervical ROM and reducing neck pain in cervicogenic headache patients, that cervical ROM is more powerful in treatment than cervical scapular strengthening exercises to reduce neck pain and improve cervical ROM¹⁵. Another study conducted by (Mitchell Haas G. B., 2017) on the Adult cervicogenic headache prevention by spinal rehabilitation exercise or manual therapy, that manual therapy is more efficient than spinal rehabilitative in decreasing intensity of headache pain and duration.¹⁶

Another study conducted by (Sarfaraj, 2018) on the Effects of simultaneous cervical traction and neural mobilisation in individuals with cervical radiculopathy, that mechanical traction with neural mobilization is more efficient in reducing neck pain and to get back functional ability ¹⁷. Another study conducted by (A Vinokumar, 2016) on the Effects of mobilization versus strength training in patient with chronic cervicogenic headache, that strength training is more effective than mobilization in improving functional ability and to reduce pain ¹⁸. Another study conducted by (Seungkyu Park, 2019) on the Impact of neck stabilising exercise and transcranial direct electrical stimulation on muscle properties and perform in individuals experiencing cervicogenic headache, showing that both are effective in lowering cervical muscle tone and improving the movement to minimize the muscle stiffness and neck disability ¹⁹.

4. Results

Table 1 Results

S. No.	Author	Title	Methodology	Outcome Measures	Conclusion
1.	Monika Rani, et al., 2022	A randomized controlled study reviewing the efficacy of spinal manipulation and postural correction techniques in the remedy of cervicogenic headache.	Sample size = 72 Groups = 3 Control group = 24 Postural correction exercises = 24 Spinal mobilization = 24	Headache severity, neck discomfort-related disability, and neck pain intensity	Cervicogenic headache can be effectively managed with exercises for posture correction and Spinal mobilization.
2.	Seyedeh Roghayeh Mousavi-Khatir, et al., 2021	A Randomised Controlled Trial of the Impact of Adding the Dry Needling Practice to Rehabilitation in the Treatment of CGH	Sample size = 23 Groups = 3 Control group = 23, underwent conventional physical therapy Placebo needling group = 23, had traditional physical therapy and superficial dry needling at a spot far from the trigger point. Dry needling group = 23, received regular physical therapy and dry needling on the muscles of the neck.	Headache frequency and intensity, neck impairment, deep cervical flexor function, and range of motion	In individuals with cervicogenic headache and activated trigger points, dry needling had a favorable impact on pain and disability reduction, cervical ROM, deep cervical flexor muscle function, and ROM.
3.	James R. dunning et al., 2016	A multi-center uncontrolled clinical trial compared upper cervical and upper thoracic manipulation with mobilisation and movement in individuals with CGH.	Sample size = 110 Groups = 2 thoracic manipulation = 58 mobilization and exercise = 52	The intensity of a headache, headache duration, frequency, and impairment Scale = Numeric Pain Rating Scale (NPRS), Neck Disability Index (NDI), Global Rating of Change (GRC).	Mobilisation and exercise were shown to be less beneficial in patients with Cervicogenic Headache (CGH) after 6-8 sessions of upper cervical and upper thoracic manipulation, and the advantages lasted after 3 months.
4.	<u>Ebrahim Ramezani</u> , et al., 2017	The impact of the sub-occipital myofascial release technique on	Sample size = 52 Age group = 15 to 75 years	Flexors, extensors, right and left rotators, and right and left	After 10 treatment sessions, both exercise and Myofascial Release (MFR) groups showed a substantial

		patients with cervicogenic headaches' cervical muscle strength	Manual palpation of the upper cervical joints during a physical examination of the cervical spine Unilateral sub occipital region-related neck discomfort Discomfort and limitation of C1-C2 rotation caused by craniocervical Functional reach test (FRT). An aggravating headache by applying physical pressure to the muscles and joints of the upper cervical region, and having had headaches for the previous six months at least once a week.	lateral flexors, as well as other cervical muscles, must be strong.	improvement in cervical muscular strength, particularly in the right and left rotators when compared to pre treatment score. Exercise group results in muscular strength for the flexors, rotators, and lateral flexors were more significant than MFR group results.
5.	Miguel Malo-Urriés, et al., 2017	An RCT examining the Direct Effects of Upper Cervical Translatory Mobilization on Cervical Mobility and Pressure Pain Threshold in CGH Patients	Sample size = 82 Group = 2 20 male and 62 female Age group = 41 to 15 years received UC-TSM (Upper Cervical Translational Spinal Mobilization) and the control group remained stationary for the same period of time.	Pressure pain thresholds across the upper trapezius muscles, C2-3 zygapophyseal joints, and sub occipital muscles, as well as the intensity of the present headache (visual analogue scale) are all evaluated.	Upper cervical translatory spinal mobilization increased upper cervical range of motion, and also appeared to increase total cervical range of motion.
6.	Mitchell Haas DC, MA et al., 2018	A dual-center RCT investigated the dose-response and success rate of spinal manipulation in therapy of CGH	Sample Size = 256 4 dose levels of <u>chiropractic</u> spinal manipulative therapy (SMT) : 0, 6, 12, or 18 sessions.	Primary outcome: frequency of headaches Secondary outcomes: headache frequency at remaining end points, Pain severity, functional limitations, reported improvements, drug usage, and patient satisfaction.	SMT visits and CGH days are connected linearly in terms of dosage and response. At the highest and most efficient dosage of 18 SMT sessions, the number of CGH days was reduced by half and increased by around 3 days per month in comparison to the light-massage control.
7.	Aleksander Chaibi et al., 2017	A single-blinded, placebo, RCT examining the CGH treatment with	Sample size = 19 Duration = 17 months	primary end-point: frequency of headaches	In both the chiropractic spinal manipulation therapy and placebo groups, the frequency of headaches

		chiropractic spinal manipulation	<p>Target population = 18 to 70 years</p> <p><u>Chiropractic</u> spinal manipulative therapy (CSMT) group received SMT using the Gonstead method.</p> <p>In the placebo group, sham manipulation was applied to the gluteal area and/or the lateral edge of the scapula. The regular pharmaceutical treatment was continued by the control group without any physical assistance.</p>	<p>Secondary end-points</p> <p>headache duration, headache intensity and headache index (HI).</p>	<p>decreased over the course of the treatment.</p> <p>The headache index in the group receiving chiropractic spinal manipulation treatment increased to record-setting levels.</p> <p>For patients with cervicogenic headache, manual therapy may be a secure treatment option.</p>
8.	Gopal Nambi et al., 2022	A Prospective, RCT investigating the comparative impact of Mulligan's Mobilization, Spinal Manipulation, and Conventional Massage Therapy in CGH	<p>Sample size = 28</p> <p>Group = 3</p> <p>Mulligan mobilization therapy (MMT) group</p> <p>Spinal manipulation therapy (SMT) group</p> <p>Control group.</p>	<p>Primary Outcome</p> <p>CGH frequency</p> <p>Secondary Outcome</p> <p>CGH pain:</p> <p>Scale = visual analogue scale (VAS).</p> <p>CGH impairment:</p> <p>Neck pain frequency, Neck pain threshold</p> <p>Test: Headache Impact Test (HIT), Flexion-rotation test (FRT)</p> <p>Scale = Neck disability index (NDI):</p>	<p>Mulligan's mobilization using the Sustained Natural Apophyseal Glides (SNAG) technique was more effective than standard massage therapy and spinal manipulation therapy in treating cervicogenic headache.</p>
9.	<u>Amy W. McDevitt et al., 2021</u>	A crossover RCT examining Thoracic spine thrust manipulation for patients with CGH	<p>Sample size = 48</p> <p>6 sessions of thoracic spine manipulation (TSM) or no treatment (Hold)</p>	<p>The global rating of change (GRC), Headache disability inventory (HDI), and neck disability index (NDI)</p>	<p>TSM had no impact on the impairment caused by headaches. It significantly reduced neck-related disability and the participant felt better.</p> <p>Future research is required to look into TSM's long-term effects on this population.</p>
10.	<u>Addison Lerner-Lentz et al., 2020</u>	A randomised clinical trial compared the pragmatic use of	<p>Sample size = 45</p> <p>Group = 2</p>	<p>Disability and pain were examined.</p> <p>Tests done:</p>	<p>When used pragmatically for patients with cervicogenic headaches, manipulation had similar effects to</p>

		manipulation vs mobilisation to treat cervicogenic headache in the higher regions of the cervical spine.	Females = 26 Males = 19 Range = 16 to 47 years Techniques: - manipulation or mobilization	Numeric Pain Rating Scale (NPRS), Neck Disability Index (NDI), the Headache Impact Test (HIT-6), the Patient Acceptable Symptoms Scale (PASS), the Global Rating of Change (GRC).	mobilisation on GRC, cervical range of motion, impairment, and discomfort.
11.	Tahir Sana et al., 2022	Effect of cervical traction versus strengthening exercise in patients of cervical radiculopathy	Sample size=20 Groups: 2 Group A: Treated with cervical traction. Group B: Treated for 3 weeks with strengthening exercise	Pain and Disability	Manual traction is more effective than strengthening exercise to reduce pain and disability
12.	Manzoor Anum et al., 2021	The impact of cervicospicular exercises on increasing cervical range of motion, lowering neck discomfort, and treating cervicogenic headache.	Sample size:30 Groups: 2 Group A: Treated with cervicospicular exercises. Group B: Treated with improving in cervical range of motion. 3 therapy sessions per week were offered during the 5-week treatment period. Scales were used NPRS, NDI, HDI.	Neck pain and ROM of cervical region	ROM of cervical region is more effective treated than cervical scapular strengthening exercises to reduce neck pain and improved cervical ROM.
13.	Haas Mitchell et al, 2017	Exercises for spinal rehabilitation or manual therapy to avoid adult cervicogenic headache	Sample size:18 Group: 2 Group A: Manual treatment treated with spinal manipulation, mobilization, massage techniques	Headache intensity of pain, Headache duration, disability	Manual therapy is more efficient than spinal rehabilitative in decreasing the intensity of headache pain and duration.

			<p>Group B: Spinal rehabilitative exercise treated with strengthening, stretching, motor control exercise.</p> <p>4 therapy sessions per week for 6 weeks were offered.</p> <p>Scales were used: HDI, NPRS, NDI</p>		
14.	Sarfaraj MD et al, 2018	The impact of cervical traction and neural mobilisation in individuals with cervical radiculopathy	<p>Sample Size: 45</p> <p>Groups: 3</p> <p>Group A: Treated with mechanical cervical traction with neural mobilization.</p> <p>Group B: Treated with only cervical traction through mechanical means.</p> <p>Group C: Treated with only the neural mobilization</p> <p>Total 4 weeks of intervention with 12 sessions of therapy which include 3 sessions of therapy in a week</p>	Neck pain and functional disability	Mechanical cervical traction along with neural mobilization is more efficient in reducing neck pain and to get back functional ability
15.	Desai Pinalben et al., 2016	Effectiveness of mobilisation vs strength training in patients with cervicogenic headaches	<p>Sample size = 30</p> <p>Group = 2</p> <p>Group A: Treated with mobilization.</p> <p>Group B: Treated with strength training.</p> <p>4-week treatment session with 2 treatment sessions were provided per week.</p> <p>Scaled used: VAS, NDI</p>	Pain and improve functional ability	Strength training is more effective than mobilization in improving functional ability and to reduce pain
16.	Park Seungkyu et al., 2019	Effects of neck stabilising exercise and transcranial direct electrical stimulation on muscle properties and function in cervicogenic headache patients	<p>Sample size = 36</p> <p>Group = 3</p> <p>Group A: Treated with cervix stabilizing exercise.</p> <p>Group B: Treated with trans cranial direct current stimulation.</p>	Changes in muscle stiffness, Neck disability	Both are successful method for lowering cervical muscular tone, improving the movement to minimize the muscles stiffness and neck disability.

			<p>Group C: Treated with cervix-stabilizing exercise paired with transcranial direct electrical stimulation.</p> <p>Total 3 weeks of interventions with 9 treatment sessions which include 2 treatment sessions in a week</p>		
17.	Jacobo Rodríguez-Sanz et al., 2022	<p>A RCT evaluation comparing the effectiveness of upper cervical spine physical therapy combined with exercise against standalone exercise in individuals with CGH</p>	<p>Sample size = 40 Group = 2</p> <p>Manual Therapy</p> <p>Exercise</p> <p>Both groups underwent a home exercise programme and four weekly 20-minute sessions.</p>	<p>Flexion of the upper cervical spine and HIT-6,</p> <p>flexion-rotation test,</p> <p>headache severity,</p> <p>cranio-cervical flexion test,</p> <p><u>pain pressure level</u>,</p> <p>GROC-scale</p>	<p>Four 20-minute manual therapy sessions combined with an exercise protocol plus a home exercise plan are more beneficial for CGH patients in the short and long terms than only an exercise protocol plus a home exercise programme.</p>
18.	James Dunning et al., 2021	<p>A multicenter RCT comparing spinal manipulation and perineural electrical dry needle therapy in cervical headache patients</p>	<p>Sample size = 142</p> <p>Groups = 2</p> <p>Time period = 36-month period.</p> <p>Group A (n=74) underwent electrical dry needling along with upper thoracic and cervical spine. Group B (n=68) underwent spinal mobilisation and exercise for the upper cervical and thoracic regions.</p>	<p>Besides electrical dry needling, manipulation of the upper cervical and upper thoracic spine.</p> <p>Exercise and spinal mobilisation for the upper cervical and upper thoracic spine</p> <p>.</p>	<p>Electrical dry needling is used to manipulate the upper cervical and upper thoracic spines and high-velocity, low-amplitude thrusts were found to be more successful in treating CGH patients than non-thrust mobilization and exercise, and the results persisted after three months.</p>
19.	Ibrahim M. Moustafa et al., 2021	<p>A 2-year pilot RCT investigation on whether cervicogenic headache discomfort and impairment are reduced when the sagittal cervical alignment is restored.</p>	<p>Sample size = 60</p> <p>Groups = 2</p> <p>Control group = 30</p> <p>Experimental group = 30</p> <p>Forward Head Posture (FHP) and cervical lordosis straightening were measured at random.</p>	<p>Headache frequency,</p> <p>Headache Impact Test-6 (HIT),</p> <p>Daily Defined Dose (DDD),</p> <p>Headache Disability Inventory (HDI),</p> <p>and lordosis and AHT, which alter radiographic alignment.</p>	<p>The outcomes demonstrated feasibility in terms of registration rate, compliance rate, adherence to exercise sessions, safety, and overall satisfaction. At 1- and 2-year follow-up, the Denneroll orthotic device had a positive effect on the management outcomes for CGH.</p>

20.	Mohamed Khalil et al., 2019	A. A RCT reviewing the efficacy of the Impact of Mulligan upper cervical manual traction in the rehabilitation of CGH	Sample size = 30 Groups = 2 Age group = 30–55 years Group A: received Mulligan upper cervical manual traction (MUCMT) Group B: Traditional treatment (TT) received hot packs, TENS, and cervical deep flexors strengthening exercise.	Headache severity, frequency of headaches, length of headaches, NDI and upper cervical rotation ROM.	MUCMT is a successful therapy for CGH patients, primarily in terms of ROM for upper cervical rotation.
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5. Discussion

With a thorough understanding of the research supporting the strengthening exercise approaches, we examined in this literature study the Effect of Strengthening Rehabilitation Exercises on Cervicogenic Headache. According to the implementation of strengthening exercises, the results of the experiments in this study varied. Desai Pinalben (2016) claimed that strengthening exercises are useful after the fourth day of application because the neck is mobilised, which helps to improve functional ability and pain relief. These results support James R. Dunning's hypothesis that mobilization can effectively lower the risk of cervicogenic headache.

On the contrary, other findings are found to be similar and effective that Ebrahim Ramezani, 2017 proposed that after 10 treatment sessions, muscle strength is more effective in strengthening exercises than MFR technique. The Seyedah's, 2021, on the other hand, suggested that in individuals with cervicogenic headache, dry needling improves deep flexor muscle function, cervical range of motion, and pain and disability reduction. The study outcome, however, were in conflict with Seyedah's theory. Further investigations may examine the cost of dry needling. According to several research, needling has some disadvantages over strengthening exercise, including a risk for pain and skin damage. It is also more expensive. Strengthening exercises have been shown to be advantageous in every way. By eliminating the requirement for particular medications or therapy equipment, the impact could be improved muscle tissue preservation, lower chance of injury, and higher strength for the patient.

6. Conclusion

Thus, there is growing evidence that adding strengthening exercises to cervicogenic headache rehabilitation has positive effects on a number of outcome measures. In people with cervicogenic headache, strengthening rehabilitation activities are useful in reducing pain intensity, neck impairment, and improving quality of life. To validate these results and establish the ideal workout parameters, more reliable studies are required.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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