RESEARCH PAPER

Cognitive Behaviour Assessment in Cervicogenic headache: A Narrative Review

[1]Dr. Seema Saini Ph.D., [2]Dr. Khyati Khade (PT), [3]Dr. Jayantika Bhardwaj (PT), [4]Dr. Divya Raju (PT) and Dr. [5]Tushar J Palekar Ph.D

[1]Professor, Musculoskeletal Sciences Department, Dr. D.Y. Patil College of Physiotherapy, Dr. D. Y. Patil Vidyapeeth, Pune
[2]Assistant Professor, Kinesiotherapy & Movement Sciences, Dr. D.Y. Patil College of Physiotherapy, Dr. D. Y. Patil Vidyapeeth, Pune
[3]Post Graduate, Dr. D.Y. Patil College of Physiotherapy, Dr. D. Y. Patil Vidyapeeth, Pune.
[4]Post Graduate, Dr. D.Y. Patil College of Physiotherapy, Dr. D. Y. Patil Vidyapeeth, Pune
[5]Professor & Principal, Dr. D.Y. Patil College of Physiotherapy, Dr. D. Y. Patil Vidyapeeth, Pune
[1]seema.saini@dpu.edu.in, [2]khyati.khade@dpu.edu.in, [3]jayantika.bhardwaj@gmail.com, [4]2000divyaraju@gmail.com and [5]principal.physio@dpu.edu.in

Received: 18th Dec, 2025; Revised: 11th Feb 2026; Accepted: 17th Feb, 2026; Available Online: 30th March, 2026

ABSTRACT

Background: A cervicogenic headache is a common and disabling condition originating from cervical spine structures, with substantial personal and economic consequences. This narrative review aims to outline the important relationship between cognitive-behavioral factors, CGH, guiding the role of psychological distress and neuroticism, further supporting the effectiveness of CBT's and pain neurophysiology education in rehabilitation.

Methods: A comprehensive literature searches up to October 2023 were conducted in Medline, PubMed, CINAHL, ISI, and IBSS. Studies were considered eligible if they included adults diagnosed with CGH, explored the relationship between pain and psychological or behavioral measures, and were published in English. The cognitive-behavioral assessment tools utilized in these studies to assess cognition and behavior included the PHQ-9, EMG biofeedback, HSCL-25, VAS, MIDAS, and CSI.

Results: This review synthesizes study data, highlighting the deep relationship between psychological discomfort, neuroticism, and CGH expression. Cognitive restructuring and behavioral approaches within CBT indicate success in lowering CGH symptoms, with long term effects on patients' overall quality of life. PNE appears as an important component, giving patients a better understanding of their condition and reducing pain catastrophizing. The biopsychosocial paradigm is integrated, with an emphasis on two critical factors in the treatment of CGH. Various cognitive-behavioral assessment tools demonstrated good reliability and validity when measuring cognitive and behavioral characteristics associated with CGH.

Conclusion: This narrative review has underlined how deeply cognitive and behavioral aspects affect CGH and approaches the need for an integrated mental and somatic view. The findings emphasize the need for further research in this direction and the creation of a complete neuropsychological diagnostic tool specifically for CGH patients. An approach that would ensure not only immediate symptom alleviation but also long-term improvement in patient well-being presents a holistic perspective for management of this complex condition.

Keywords: Cervicogenic headache, cognitive-behavioral factors, cognitive-behavioral therapy, pain neurophysiology education, biopsychosocial model, assessment tools, psychological distress, neuroticism, health related quality of life.

How to cite this article: Saini S, Khade K, Bhardwaj J, Raju D, Palekar TJ, Cognitive Behaviour Assessment in Cervicogenic headache: A Narrative Review. Int J Drug Deliv Technol. 2026;16(3): 355-363. DOI: 10.25258/ijddt.16.3.40

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

Reduced quality of life productivity at work are the results of a widespread and incapacitating disorder known as cervicogenic headache, which is characterised by head pain that originates from cervical nociceptive structures [1,2] that is, the cervical spine and its musculoskeletal structures.[3,4] All of the many, mental processes that go into learning, comprehending and applying knowledge are referred to as cognition. It includes tasks like focusing, remembering, reasoning, comprehending, and learning languages. When attention span, memory processing, decision-making ability, language disorder, spatial awareness, psychomotor abilities., and learning skills are impaired, it is referred to as cognitive dysfunction.[5,6]

**Author for Correspondence: seema.saini@dpu.edu.in*

People experiencing chronic pain tend to exhibit lower cognitive function scores compared to those without chronic pain, particularly in aspect of information to memory processing, cognitive flexibility, as well as focus.[7,8] Research has indicated that those who have cervicogenic headaches exhibit reduced cognitive function. Patients have also been seen to have emotional disturbance and trouble carrying out everyday tasks.[9,10] When compared with others of similar ages and educational background, they also had higher levels of depression and pain catastrophizing, which ultimately resulted in a diminished health-related quality of life.[11,12,2]

Previous studies evaluated cognition and the effects of pain using a variety of instruments. However, there are no universally accepted standards for evaluating the CGH.[13]

Cognitive depression symptoms including discouragement, disappointment, indecision, exhaustion, and social disengagement are included in the Beck Depression Inventory (BDI) self-report questionnaire.[5] Pain catastrophizing scale (P.C. S) was used to assess the impact of pain.[11] Patients with cervicogenic headaches have been found to have considerably higher BDI and PCS scores. Cognitive capacities are assessed using the Montreal Cognitive Assessment Scale (MoCA) and the Standard Mini Mental Test (SMMT).[5] The primary cause of depression in people with Cervicogenic Headache (CGH) may be related to the frequency and duration of their discomfort. Both disorders share a common origin, especially involving neurotransmitters.[14]

Neurotransmitters such as serotonin and norepinephrine, which are known to have changed levels of depression, also play a crucial role in gate control modulation.[14] This review explores the cognitive behavioral assessment of CGH, combining results from extensive research studies, with the goal of examining the complex nature of CGH, primarily the role of cognitive and behavioral factors in its onset and progression. While many evaluations concentrate on evaluating symptoms or overall functioning, a deeper understanding of the underlying cognitive causes of distress and impairment is crucial, as a thorough assessment of incorrect information processing and irrational thought patterns is vital, as these aspects may be overlooked by alternative methods.[15] Few studies have highlighted that people's ability to manage pain can be influenced by their beliefs, and that the effectiveness of coping styles/resources can impact psychological symptoms.[16]

This review provides a critical viewpoint on how behavioral patterns and cognitive processes influence how CGH is perceived and managed, which in turn affects treatment results. The effectiveness of CBT as an intervention in managing CGH is critically examined, with a focus on how it might improve coping mechanisms and alter how patients perceive pain. Additionally, it discusses the impact of pain neurophysiology education (PNE) in demystifying the pain experience for patients and reducing associated fear and anxiety. A key component is the incorporation of the biopsychosocial model, which emphasizes the necessity of considering the biological, psychological, and social aspects of CGH to treat it effectively.[17] A variety of cognitive-behavioral evaluation instruments in CGH are also evaluated in the study, highlighting their significance in creating individualized treatment regimens. By examining the body of available research, this review offers insights into the cognitive-behavioral elements of managing CGH, assisting researchers and clinicians in creating more comprehensive and successful approaches to therapy.

METHODS

This narrative review is grounded in the literature brought to our attention on or before October 2023. The review included studies found by searching keywords in databases such as Medline, PubMed, CINAHL, ISI, and IBSS. Keywords searched included cognitive behavior assessment, cervicogenic headache, chronic pain, headache, cognitive dysfunction, and cognitive behavior therapy.

Eligibility criteria

This review considered studies that met the following conditions:

1. The research involved adults and older adults.
2. It included individuals diagnosed with cervicogenic headaches.
3. The study explored the connection between the area of pain and psychological or behavioral assessments.
4. Only full-text articles of original research published in English were included.

Studies were excluded from the review who did not meet the inclusion criteria.

RESULTS

Cognitive-behavioral Factors in Cervicogenic Headache

Overview of Cognitive-Behavioral Influences in CGH

Cognitive and behavioral aspects are intricately linked to cervicogenic headache (CGH). A growing number of studies indicate that CGH is closely related to how people perceive and respond to pain in an emotional and cognitive level rather than merely physical symptom. For instance, research findings have revealed that CGH patients have increased pain sensitivity, which is frequently linked with psychological stress. According to the cognitive-behavioral model of CGH, attitudes, ideas, and beliefs about pain play a big impact on how it is perceived and managed. This model highlights the need of comprehending the psychological foundations of CGH in order to create more potent treatment strategies.[18,17]

Psychological Distress and Neuroticism in CGH

The relationship between psychological distress, neuroticism, and CGH is bidirectional and complex. In addition to aggravating headache symptoms, CGH patients

frequently have higher levels of stress and anxiety, which can lead to a more severe and extensive diagnosis. Higher pain perception and decreased pain tolerance have been tied to neuroticism, which is marked by a propensity for negative emotional states, in individuals with CGH. These findings underscore the necessity of psychological evaluations in CGH treatment, as addressing these emotional and psychological factors can lead to more comprehensive and effective management of the condition.[19]

Efficacy of Cognitive-Behavioral Therapy in CGH
Cognitive Restructuring and CGH Management
Cognitive restructuring in CBT is an effective technique for patients with CGH as it tackles the maladaptive thought process that contributes to the chronicity and intensity of headaches. For example, patients might learn to replace thoughts like "This pain will never improve" with "I have strategies to manage and cope with my pain effectively." This perceptive shift reduces the psychological distress associated with CGH and helps individuals develop a sense of control and empowerment, crucial for long-term pain management. According to studies, this cognitive shift can significantly reduce the frequency and intensity of headaches, enhancing patients' overall quality of life.[11,18]

Behavioral Techniques in CBT for CGH
Behavioral techniques within CBT like relaxation training, biofeedback, and stress management play a significant role in alleviating CGH symptoms. Methods of relaxation, such as deep breathing exercises, participating in progressive muscle relaxation therapy, and using guided imagery techniques, prove effective in alleviating the physical tension commonly linked to headaches. These techniques provide patients with practical tools in managing their stress responses, a common trigger for CGH. Incorporating these behavioral strategies into day-to-day life enables patients to respond more effectively to the onset of headaches, potentially reducing their frequency and intensity.[20,18]

CBT's Long-term Impact on CGH
The long-term effect of CBT on CGH management extends beyond immediate symptom relief. Patients often report an enduring change in their approach to managing pain, with efficient coping strategies and a reduced need for medications. This sustainable impact is partly due to the skills and knowledge patients acquire during CBT, which can be applied throughout their lives. For example, the ability to recognize and alter stress-inducing thoughts can have a lasting effect on how patients experience and manage their headaches. Furthermore, CBT's focus on self-efficacy and personal control over pain contributes to improved patient outcomes. Longitudinal studies show that these benefits persist longer, even after completion of treatment, indicating its effectiveness as a vital component of comprehensive management.[18]

Pain Neurophysiology Education in CGH - Conceptual Understanding of Pain in CGH
Pain Neurophysiology Education (PNE) is crucial in transforming patients' perception of pain. It challenges deeply ingrained misconceptions about pain and provides evidence-based reasoning of how pain is processed and perceived by the body. For example, PNE teaches that pain does not always signify tissue damage but can also be due to hypersensitivity of the nervous system. This understanding helps patients reconceptualize their experience of CGH, shifting from a purely biomedical model of pain (which focuses on physical causes) to a more comprehensive understanding that includes neurological and psychological factors. Such an informed understanding is essential for patients with their treatment plans and to adopt a more proactive approach to manage their condition.[21]

PNE's Role in Reducing Pain Catastrophizing
Pain catastrophizing, characterized by an excessively adverse response to either actual or perceived pain, is a common psychological aspect observed among people with CGH. PNE presents patients with a rational and plausible explanation of pain, which successfully resolves their issue. Patients who understand the mechanics underlying pain are less likely to overreact to their condition, which reduces the sense of anxiety and fear that comes with CGH.[21]

BIOPSYCHOSOCIAL MODEL IN CGH MANAGEMENT

Integrating the Biopsychosocial Approach
The biopsychosocial model offers a comprehensive framework for understanding and managing cervicogenic headaches (CGH). It acknowledges that CGH extends beyond a mere physical health concern, as a complex interlinking of biological, psychological, and social elements. Biological aspects include the physiological and anatomical contributors to CGH, whereas psychological aspects involve cognitive and emotional responses to pain. Biological factors involve the individual's environment like family, work, and broader social interactions, which can significantly impact the experience and management of CGH. Beyond conventional biological models that largely focus on physical symptoms, healthcare practitioners can offer a comprehensive and useful approach to CGH therapy by considering these many aspects.[22]

Role of Psychosocial Factors in CGH
Significant contributors to the initiation and worsening of CGH encompass psychological elements, including depression, stress, and anxiety. These can influence pain perception, making headaches more severe or frequent. Social factors such as work-related stress, family dynamics, and social support systems also play a crucial role. Addressing these factors through counseling, support groups, and lifestyle modifications can significantly improve treatment outcomes.[22,23]

Clinical Implications of the Biopsychosocial Model
In clinical practice, this model necessitates a comprehensive approach to treatment, involving medical

interventions, social, and psychological support. This may include a combination of medication, physical therapy, CBT, stress management techniques, relaxation methods, and social support interventions. Tailoring and individualized treatment protocols can lead to more effective management of CGH, with better long-term outcomes.[22]

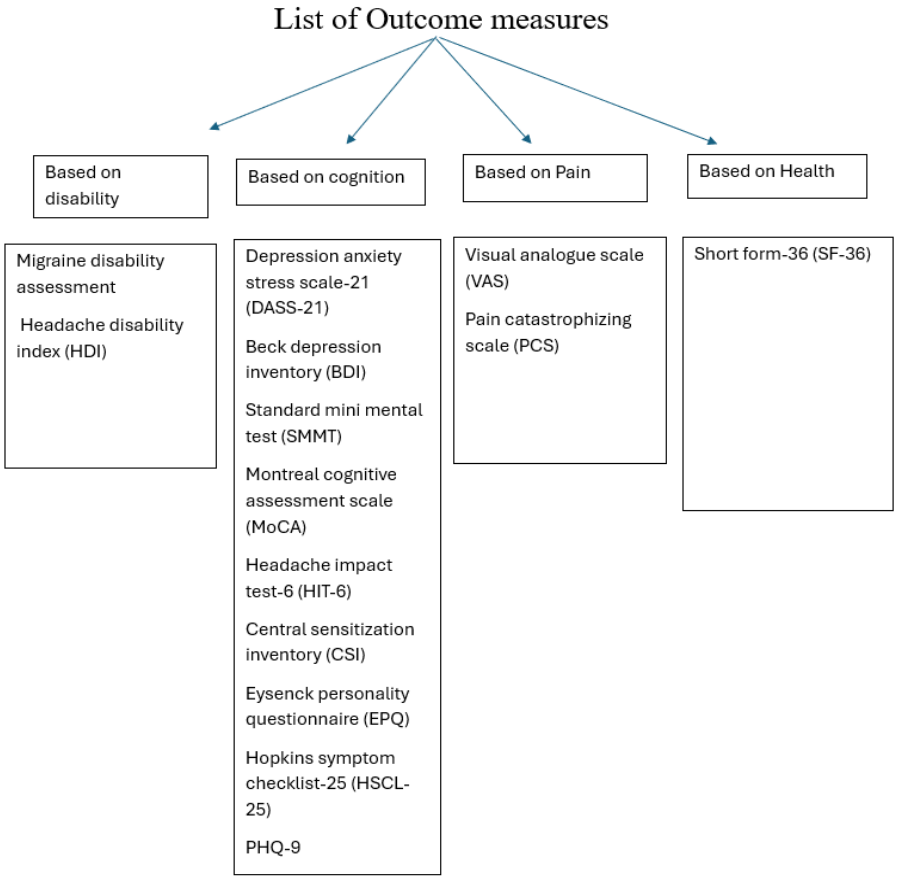
COGNITIVE-BEHAVIORAL ASSESSMENT TOOLS IN CGH

Utilizing Assessment Tools for a Comprehensive Evaluation

A range of assessment tools such as questionnaires and interviews is vital in evaluating the psychological aspects of CGH. These tools help to spot the appropriate cognitive and behavioral patterns that might contribute to the severity and frequency of headaches. This assessment tool is crucial to form an individualized treatment protocol that will address individuals' psychological needs, ensuring a more focused and effective approach to CGH management.

Impact of Assessment on Treatment Strategies

The information collected from cognitive-behavioral assessments directly informs the development of treatment strategies. For example, if a patient exhibits high levels of pain catastrophizing, interventions can be focused on cognitive restructuring and education about pain. [11]Similarly, if stress is identified as a significant trigger for CGH, stress management techniques and relaxation therapies may be prioritized. By accurately assessing cognitive and behavioral factors, healthcare providers can optimize effective treatment strategies to address the root causes of CGH, enhancing the overall effectiveness of the management strategy.



RESEARCH MATRIX

Author & Date	Outcome Measures	Sample	Conclusion	Psychometric Properties
Keerti Rao et al.,2013[14]	A Questionnaire based survey PHQ-9	N= 100 50 in CGH group 50 in control group	Individuals with Cervicogenic Headache (CGH) showed a higher occurrence of depression, according to the PHQ-9, compared to those who experienced conditions other than headaches.	PHQ-9 sensitivity =88% specificity =88% for major depressive disorders. Internal consistency has been shown to be high.
Nawal A. Shady et al., 2016[18]	EMG biofeedback	N= 30 15 received CBT combined with physiotherapy 15 in control group	Three behaviour therapy techniques used for headache-biofeedback therapy, relaxation training and stress coping training. This study has concluded that EMG biofeedback is a significant method for treatment for cervicogenic headache.	
Espen Kristofferson et al., 2018[24]	Hopkins symptom checklist-25 (HSCL-25) The migraine disability assessment (MIDAS) Eysenck personality questionnaire (EPQ)	N=95 Patient with chronic post-traumatic headache (N=38) Patient with cervicogenic headache (N=21) Patient with headache due to chronic rhinosinusitis (N=39) Patient with co-occurrence of cervicogenic headache (N=9)	People with secondary headache have psychological distress and neuroticism score more than general population.	HSCL-25 Global Cronbach's alpha 0.92 Sensibility-88.1% specificity-76.7%. MIDAS Cronbach alpha = 0.8
Ibai Lopez-de-Uralde-Villanueva et al., 2020[11]	Visual analogue scale (VAS) Pain catastrophizing scale (PCS)	N=47 Experimental group 1 given manual therapy (MT) with therapeutic patient education (TPE) based on	The effectiveness in alleviating pain intensity at the 4-month was more pronounced in the (Exp2) compared to both (Exp1) and the control group. After	VAS Good to excellent correlation Cohen d ≥ 0.8 PCS Good internal reliability (alpha=0.92)

		biobehavioural approach (N=16) Experimental group 2- MT with TPE and therapeutic exercises (N=16) Control group – manual therapy(N=15)	the treatment, only Exp2 exhibited superior efficacy when compared to the control group. These findings suggest that for individuals experiencing chronic non-specific neck pain (CNSNP), a multimodal physiotherapy approach that integrates MT, TPE rooted in a biobehavioural approach, and therapeutic exercise should be considered.	Test-retest reliability (Spearman p =0.88)
Ji-yong Bae et al., 2021[20]	Migraine disability assessment (MIADS) Headache Impact Test (HIT-6) Visual analogue scale (VAS)	N=22 studies included in qualitative synthesis- n=11 Studies included in quantitative analysis- n=11	This study revealed that Cognitive Behavioral Therapy (CBT) demonstrates efficacy in reducing both the frequency of headaches and MIDAS scores in individuals diagnosed with migraines, with minimal adverse events reported. Upon conducting subgroup analysis, the impact of CBT on migraines was particularly significant in relation to headache intensity.	MIDAS Cronbach alpha = 0.8 VAS Good to excellent correlation Cohen d ≥ 0.8 HIT-6 High reliability (alpha = 0.87)
Sarah Mingels et al., 2021[25]	Central sensitization inventory (CSI) Depression anxiety stress scale-21 (DASS-21) Headache impact test-6 (HIT-6)	N=30 N=15Headache group N=15 Control group	The identified correlations between spinal postural variability and biopsychosocial (BPS)variables contribute novel perspectives to the existing understanding of CGH. In the CGH group, spinal postural variability was observed to be	HIT-6 High reliability (alpha = 0.87) DASS-21 Cronbach's alpha = 0.959 CSI Cronbach's alpha = 0.96

			reduced, and it demonstrated associations with a broader range of BPS variables, including pain processing, lifestyle factors, and psychosocial aspects, when compared to the control group.	
Ehsan Ghasemi et al., 2023[21]	Visual analog scale (VAS) Headache disability index (HDI) Pain catastrophizing scale (PCS)	N=30 Experimental group (N=15) Control group (N=15)	PNE has demonstrated short-term positive effects on the attitudes and knowledge of individuals coping with pain. The evidence suggests that PNE not only reduces pain and enhances the capabilities of those with CGH but also leads to more significant improvements in diminishing pain and pain catastrophizing. Additionally, it shows partial effectiveness in reducing disability and enhancing physical performance.	PCS Good internal reliability (alpha=0.92) Test-retest reliability (Spearman p =0.88) HDI High internal consistency reliability and good content validity (r = 0.83)
Savas Karpuz et al., 2023[5]	Visual analogue scale (VAS) Beck depression inventory (BDI) Pain catastrophizing scale (PCS) Short form-36 (SF-36) Standard mini mental test (SMMT) Montreal cognitive assessment scale (MoCA)	N=60 Study included patient diagnosed with CGH (N=30) Healthy controls (N=30)	This study showed individuals suffering from CGH display impaired cognitive performance during headache episodes. Moreover, in comparison to individuals without health issues, they manifest elevated levels of depression and pain catastrophizing, coupled with a diminished quality of life.	In individuals with CGH, MoCA domains, excluding orientation and SMMT score, exhibited significantly lower values ($p < 0.05$). There was no noteworthy correlation between VAS, SMMT, and MoCA scores. However, a positive correlation was identified between MoCA

				and SMMT (r = 0.447, p = 0.013). Additionally, a significant correlation was observed with the BDI (p = 0.018).

CONCLUSION

This Narrative review explores the multifaceted realm of cognitive-behavioral assessment in the management of cervicogenic headache (CGH), drawing upon a range of insights from research studies. It emphasizes how cognitive and behavioral aspects have a significant impact on CGH and how they interact with physical symptoms to influence the condition's duration, severity, and effectiveness of therapy. The effectiveness of CBT as an intervention in the treatment of CGH is especially noteworthy. Research suggests that CBT can help patients change their cognitive and emotional responses to pain in addition to reducing physical symptoms. Pain neurophysiology education (PNE) emerges as another critical component, offering patients deeper insights into their condition and empowering them with knowledge to manage their symptoms effectively.

The use of the Biopsychosocial model offers a thorough perspective on CGH that takes into account all three biological, psychological, and social factors. This paradigm promotes a shift away from a purely biological perspective by recognizing the significance of these factors in th experience and management of CGH.

Furthermore, CGH's cognitive-behavioral assessment tools have shown to be quite beneficial in tailoring treatment to meet the needs of each patient. By facilitating a more nuanced knowledge of the psychological foundations of CGH, these tools help develop tailored and successful treatment plans.

Overall, the review concludes that there is a need for an integrated approach to management of CGH with a need for a comprehensive cognitive assessment tool specially designed for cervicogenic headache patients. Such an approach to management promises not only immediate relief of symptoms but also long-term improvement in well-being of patients. The insights gained from this review point towards a future where managing CGH is as much about understanding the mind as it is about treating the body, emphasizing the need for clinical research on the cognitive-behavioral aspects of this complex condition.

REFERENCES

1. van Suijlekom H, Van Zundert J, Narouze S, Van Kleef M, Mekhail N. Cervicogenic Headache. Pain Pract. 2010;10(2):124–30.
2. Van Suijlekom HA, Lamé I, Stomp-Van Den Berg SGM, Kessels AGH, Weber WEJ. Quality of Life of Patients with Cervicogenic Headache: A Comparison with Control Subjects and Patients with Migraine or Tension-type Headache. Headache. 2003;43(10):1034–41.
3. Rani M, Kaur J. Effectiveness of different physiotherapy interventions in the management of cervicogenic headache: a pilot randomized controlled trial. J Man Manip Ther [Internet]. 2022;30(2):96–104. Available from: https://doi.org/10.1080/10669817.2021.1962687
4. Anarte-Lazo E, Carvalho GF, Schwarz A, Luedtke K, Falla D. Differentiating migraine, cervicogenic headache and asymptomatic individuals based on physical examination findings: a systematic review and meta-analysis. BMC Musculoskelet Disord. 2021;22(1):1–18.
5. Karpuz S, YILMAZ R, AKDERE E, KÜÇÜK A, COP H, YILMAZ H. Frequency of cognitive dysfunction in individuals with cervicogenic headache. Neurol Asia. 2023;28(2):329–36.
6. Vuralli D, Ayata C, Bolay H. Cognitive dysfunction and migraine. J Headache Pain. 2018;19(1).
7. Berryman C, Stanton TR, Jane Bowering K, Tabor A, McFarlane A, Lorimer Moseley G. Evidence for working memory deficits in chronic pain: A systematic review and meta-analysis. Pain [Internet]. 2013;154(8):1181–96. Available from: http://dx.doi.org/10.1016/j.pain.2013.03.002
8. Lee SH, Kang Y, Cho SJ. Subjective cognitive decline in patients with migraine and its relationship with depression, anxiety, and sleep quality. J Headache Pain. 2017;18(1):1–8.
9. Liebert A, Rebbeck T, Elias S, Hawkins D, Adams R. Musculoskeletal physiotherapists' perceptions of non-responsiveness to treatment for cervicogenic headache. Physiother Theory Pract. 2013;29(8):616–29.
10. Sullivan MJL, Thorn B, Haythornthwaite JA, Keefe F, Martin M, Bradley LA, et al. Theoretical perspectives on the relation between catastrophizing and pain. Clin J Pain. 2001;17(1):52–64.
11. López-de-Uralde-Villanueva I, Beltran-Alacreu H, Fernández-Carnero J, La Touche R. Pain management using a multimodal physiotherapy program including a biobehavioral approach for chronic nonspecific neck pain: a randomized controlled trial. Physiother Theory Pract. 2020;36(1):45–62.

12. Torkamani M, Ernst L, Cheung LS, Lambru G, Matharu M, Jahanshahi M. The neuropsychology of cluster headache: Cognition, mood, disability, and quality of life of patients with chronic and episodic cluster headache. Headache. 2015;55(2):287–300.

13. Fredriksen TA, Antonaci F, Sjaastad O. Cervicogenic headache: too important to be left un-diagnosed. J Headache Pain. 2015;16(1):6–8.

14. Physiotherapy C. Pain & Relief. 2013;2–4.

15. Saini S, Golwala P, Tiwari D. Development and Validation of the Cognitive Behavior Questionnaire in Nonspecific Chronic Low Back Pain (CBQ-NSCLBP). Cureus. 2023;15(7).

16. Bertolotti G, Vidotto G, Sanavio E, Frediani F. Psychological and emotional aspects and pain. Neurol Sci. 2003;24(SUPPL. 2).

17. Monticone M, Ambrosini E, Rocca B, Cazzaniga D, Liquori V, Pedrocchi A, et al. Group-based multimodal exercises integrated with cognitive-behavioural therapy improve disability, pain and quality of life of subjects with chronic neck pain: A randomized controlled trial with one-year follow-up. Clin Rehabil. 2017;31(6):742–52.

18. Shady NAA, Ph D, Mohamed AH, Sc M. Effect of Cognetive Behavioral Therapy on Cervicogenic Headache Patients. 2016;84(1):649–55.

19. de Graaf JA, Schepers VPM, Nijsse B, van Heugten CM, Post MWM, Visser-Meily JMA. The influence of psychological factors and mood on the course of participation up to four years after stroke. Disabil Rehabil [Internet]. 2020;0(0):1–8. Available from: https://doi.org/10.1080/09638288.2020.1808089

20. Bae JY, Sung HK, Kwon NY, Go HY, Kim TJ, Shin SM, et al. Cognitive Behavioral Therapy for Migraine Headache: A Systematic Review and Meta-Analysis. Med. 2022;58(1).

21. Ghasemi E, Naji SS, Najafi MR, Ghasemi M, Karimi A. Investigating the Effect of Pain Neurophysiology Education in the Treatment of Cervicogenic Headache: A Randomized Clinical Trial. Middle East J Rehabil Heal Stud. 2023;10(4).

22. Mingels S, Dankaerts W, van Etten L, Bruckers L, Granitzer M. Spinal postural variability relates to biopsychosocial variables in patients with cervicogenic headache. Sci Rep. 2021;11(1):1–13.

23. Scharff L, Turk DC, Marcus DA. Psychosocial and Behavioral Characteristics in Chronic Headache Patients: Support for a Continuum and Dual-Diagnostic Approach. Cephalalgia. 1995;15(3):216–23.

24. Kristoffersen ES, Aaseth K, Grande RB, Lundqvist C, Russell MB. Psychological distress, neuroticism and disability associated with secondary chronic headache in the general population - The Akershus study of chronic headache. J Headache Pain. 2018;19(1).

25. Mingels S, Granitzer M, Dankaerts W, Etten L Van, Bruckers L. Exploring multidimensional characteristics in cervicogenic headache : Relations between pain processing , lifestyle , and psychosocial factors. 2021;(August):1–13.