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PHYSIOTHERAPY IN CERVICOGENIC HEADACHE FROM THE PERSPECTIVE OF CERTIFIED MULLIGAN CONCEPT® PRACTITIONERS - A DELPHI STUDY

ORIGINAL ARTICLE

ABSTRACT

Purpose: Cervicogenic headache is a common disorder that physiotherapists may encounter in the clinic. There are many methods in the literature about the evaluation and treatment of this disorder. This study aims to create a consensus on the opinions of physiotherapist with certification Mulligan Concept Practitioners about Mulligan Concept and other frequently used physiotherapy approaches in people with cervical headache.

Methods: This study was planned to be completed in 3 internet-based survey rounds. The surveys were sent to physiotherapist certified as Mulligan Practitioner. The consensus was achieved when 70% of the experts agreed.

Results: Consensus was reached on 16 key messages. The most frequently preferred assessment methods are Visual Analogue Scale, Neck Disability Index, Flexion Rotataion Test, and Range of Motion. In addition to Mulligan mobilization, exercise therapy and patient education were the most commonly used treatment options.

Conclusions: It is thought that this study provides important key messages about Mulligan mobilization and physiotherapy methods that can be used in addition to this technique in the evaluation and rehabilitation of people with cervicogenic headache.

Key words: Cephalalgia, Manual Therapy, Physical Therapy Modalities

SERTİFİKALI MULLIGAN MOBİLİZASYON UYGULAYICILARININ PERSPEKTİFİNDEN SERVİKOJENİK BAŞ AĞRISINDA FİZYOTERAPİ - BİR DELPHI ÇALIŞMASI

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Servikojenik baş ağrısı, fizyoterapistlerin klinikte karşılaşabilecekleri yaygın bir problemdir. Literatürde bu bozukluğun değerlendirilmesi ve tedavisi ile ilgili birçok yöntem bulunmaktadır. Bu çalışma, Sertifikalı Mulligan Mobilizasyon Uygulayıcısı olan fizyoterapistlerin servikojenik baş ağrısı olan kişilerde, Mulligan mobilizasyonu ve diğer sık kullanılan fizyoterapi yaklaşımları hakkında anahtar mesajlar oluşturmayı amaçlamaktadır.

Yöntem: Bu çalışmanın uluslararası olarak internet tabanlı 3 anket turunda tamamlanması planlandı. Anketler, Sertifikalı Mulligan Mobilizasyon Uygulayıcısı olan fizyoterapistlere gönderildi. Uzmanların %70'i aynı fikirde olduğunda fikir birliği sağlandı.

Sonuçlar: 16 anahtar mesaj üzerinde fikir birliğine varıldı. En sık tercih edilen değerlendirme yöntemleri; Görsel Analog Skala, Boyun Özür İndeksi, Fleksiyon Rotasyon Testi ve hareket açıklığı olarak belirlendi. Mulligan mobilizasyonu ile birlikte en sık kullanılan yaklaşımların da egzersiz ve hasta eğitimi olduğu görüldü.

Tartışma: Bu çalışmanın, servikojenik baş ağrısı olan kişilerin değerlendirme ve rehabilitasyonunda Mulligan mobilizasyonu ve bu tekniğe ek olarak kullanılabilecek fizyoterapi yöntemleri hakkında önemli anahtar mesajlar sunduğu düşünülmektedir.

Anahtar Kelimeler: Baş Ağrısı, Manuel Terapi, Fizik Tedavi Modaliteleri

INTRODUCTION

Cervicogenic headache has become a problem that is frequently encountered by physiotherapists in clinics. According to previous studies, the most prominent features of cervicogenic headache are that it starts unilaterally from the neck region, spreads to the fronto-temporal region, usually does not change sides, and is triggered by neck movements (1). The studies have demonstrated that manual therapy and personalized exercise training are very effective (2). One study on this subject indicated that the most commonly used manual therapy methods were mobilization and manipulation (3).

Mulligan mobilization is a method which has been shown might be successful for the treatment of cervicogenic headache (4). Since Mulligan Concept is a very comprehensive method, many different techniques used in cervicogenic headaches are encountered in the literature (5,6). This makes it difficult to decide the effective technique for cervicogenic headaches. With the wide range of assessment and rehabilitation options, the determination of the most suitable and most frequently used for cervicogenic headache may be considered to be of importance.

The number of studies examining the effects of the Mulligan Concept on cervicogenic headache is insufficient. Details about the techniques used and frequency of application are not clear enough. Therefore, the objectives of this study were to reach a consensus on the most frequently used methods of physiotherapy and Mulligan Concept for cervicogenic headache used by physiotherapists with Certified Mulligan Practitioner (CMP) worldwide

The Delphi technique is used to systematically reach consensus on a complex problem from the views of relevant experts. This technique is known for flexibility and reflexivity, with various modification possibilities offered to the researcher. The researcher can configure the questionnaire, which is the data collection tool. In this way, it provides considerable flexibility in the design phase, as well as enables the collection of a rich and diverse data set. The internet-based Delphi technique involves the same processes, except for the usage of the online platform with classic Delphi. Since the internet-based delphi technique has significant advantages over classical delphi in terms of time, place and cost, its usage frequency has gradually increased (7). This technique was used to provide international information exchange and consensus with physiotherapists with CMP.

METHODS

This internet-based Delphi study was conducted at Hacettepe University, Faculty of Physical Therapy and Rehabilitation, from June 1, 2019 to May 1, 2020. This study was planned to be completed in 3 rounds of emails on an online platform. The pre-determined questions were sent as a questionnaire via Google Forms. The questions were designed to be multiple choices, open-ended, and multi-response. The responses to all the questions were calculated as a percentage of the total participants. Each physiotherapist who was planned to be included in the study was sent a questionnaire with an explanation giving detailed information about the study. The responses were collected for an average of 3 weeks, and then the receipt of responses was turned off. This research has been approved by the University Non-Entrepreneurial Ethics Committee of the authors' affiliated institutions.

Identification of Delphi Survey Items

In order to determine the questions, a detailed literature review was conducted and the studies conducted in this field were examined. Various evaluation and rehabilitation approaches used in cervicogenic headache were noted. Then, these approaches were determined, for which consensus had not yet been reached. The questions were generally aimed at examining the rate of use, method of application and effectiveness of these approaches. All questions in the survey for each of the 3 rounds are given in the tables. The two researchers with at least 4 years of experience in the field decided the questions together in each round.

Participants

Physiotherapists that have Certified Mulligan Practitioner certification were included in this study. These physiotherapist who actively practice Mulligan mobilization, routinely treat people with cervicogenic headaches. Contact information of these experts were reached on the official site of the Mul-

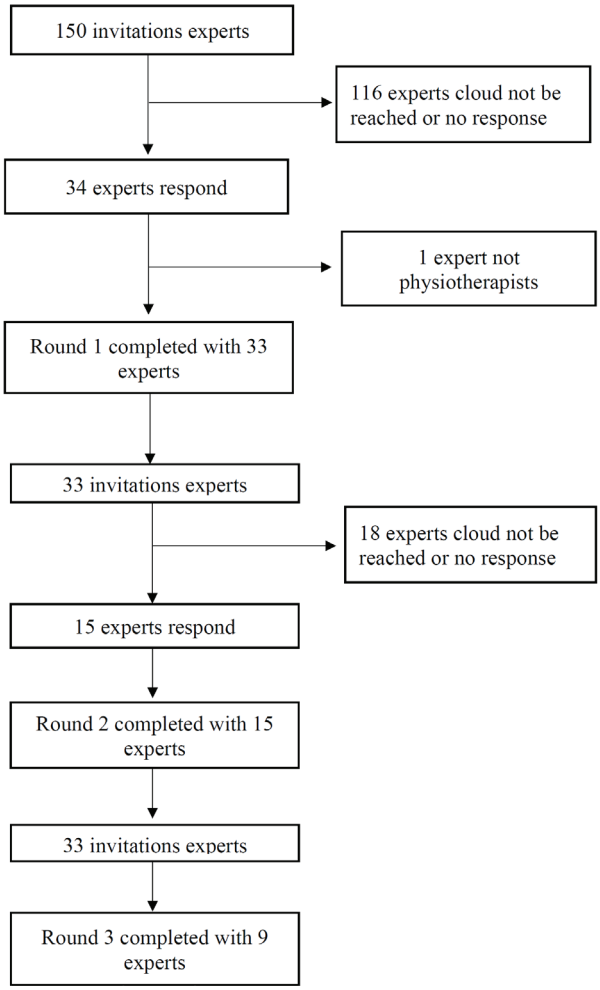


Figure 1. Flow Diagram

ligan Manual Therapy Concept, then the questionnaires were sent. As of 24 April 2019, a total of 150 experts were invited to participate in the first round by e-mail (Figure 1). In the second and third rounds, the questionnaires were sent only to those who responded in the first round to ensure consistency between the answers. Only the answers of physiotherapists were taken into consideration for all three rounds. The number of participants was 33 for the first round, 15 for the second round and 9 for the third round (Figure 1).

Round 1. The first questionnaire comprised a total of 26 questions. The first 5 questions were related to the gender of the participant, nationality, profession, the field of expertise and experience of cervicogenic headache. The remaining 21 questions for this round were created to reach the consensus with 6 questions about pre- and post-treatment evaluation of cervicogenic headache and 15 about different treatment techniques. Three of these questions were prepared for parameters such as duration, frequency, and the number of sessions of physiotherapy and rehabilitation for cervicogenic headache and 2 were about possible contraindications of rehabilitation.

Round 2. In the second questionnaire round, in addition to the first round items, 5 questions were added for which consensus had not been reached in the literature. This second questionnaire was sent to the same experts again to examine the consistency between the two rounds. Thus, it was aimed to give the experts the opportunity to rethink the same questions and to change their ideas if they so wished. To be able to reach a consensus on a subject, it is considered a key point that experts are given the opportunity to make changes to their ideas (8).

Two of the 5 newly added questions were related to the routine follow-up of people with cervicogenic headache. 3 additional items were added to obtain detailed information about Mulligan mobilization. These questions were selected due to some differences in the techniques applied in studies on Mulligan mobilization for cervicogenic headache (9, 10). One question asked whether Mulligan mobility has long-term effectiveness, and two questions were directed to the rotational component of Mulligan mobilization for cervicogenic headache.

Round 3. The third and final questionnaire included only questions for which consensus could not be reached in the first and second rounds. As in the previous two rounds, the first questions were related to the nationality, profession, specialty and experience of the participant. The remaining 9 questions were sent back to the physiotherapist with CMP. 3 questions were related to the use of different methods used in the evaluation, 3 questions were about Mulligan Concept, 2 questions were about session time and duration of treatment, and 1 question was about post-discharge follow-up.

Data analysis

The purpose of a multi-round survey is to reach a consensus on the international platform through the opinions of physiotherapists with CMP. In this study, percentage values were calculated of the response scores given to all the questions. The percentage value was calculated according to the

Table 1. Expert Characteristics

Characteristic	Round 1 (n=33)	Round 2 (n=15)	Round 3 (n=9)
	n(%)	n(%)	n(%)
Gender-female(%)-male (%)	2 (6.06%)-31 (93.93%)	0-15 (100%)	2 (22.20%)-7 (77.80%)
Occupation	Researcher 7 (21.21%) Clinician 25 (75.75%) Other 4 (12.12%)	Researcher 2 (13.33%) Clinician 15 (100%)	Researcher 2 (22.22%) Clinician 8 (88.88%) Other 1 (11.11%)
Health care profession	Physiotherapist 32 (97%) Physiotherapist and Osteopathy 1 (3%)	Physiotherapist 15 (100%)	Physiotherapist 8 (88.88%) Physiotherapist and Osteopathy 1 (11.11%)
Experience	2-3 years 5 (15.10%) 4-6 years 5 (15.20%) 7-10 years 7 (21.20%) More than 10 years 16 (48.50%)	2-3 years 1 (6.66%) 4-6 years 2 (13.33%) 7-10 years 5 (33.33%) More than 10 years 7 (46.66%)	2-3 years 1 (11.11%) 4-6 years 0 (0%) 7-10 years 4 (44.44%) More than 10 years 4 (44.44%)
Country-n (%)	Argentina 4 (12.12%) Australia 1 (3.03%) Belgium 3 (9.09%) Brazil 6 (18.18%) Bulgaria 1 (3.03%) Canada 1 (3.03%) Egypt 1 (3.03%) France 1 (3.03%) Greece 2 (6.06%) India 3 (9.09%) Japan 3 (9.09%) Spain 1 (3.03%) Turkey 2 (6.06%) USA 4 (12.12%)	Argentina 3 (20%) Australia 1 (6.66%) Belgium 1 (6.66%) Brazil 1 (6.66%) Canada 1 (6.66%) France 1 (6.66%) Greece 2 (13.33%) Japan 2 (13.33%) Turkey 2 (13.33%) USA 1 (6.66%)	Argentina 3 (33.33%) Australia 1 (11.11%) Brazil 1 (11.11%) Greece 1 (11.11%) Japan 1 (11.11%) Turkey 1 (11.11%)

number of answers to each question. 2 researchers coded the data. For any question, a response of 70% or higher was considered to be sufficient to reach consensus (11).

RESULTS

A total of 150 certified Mulligan Practitioners were invited for the first round. Of these, 33 physiotherapists and 1 medical doctor responded. A detailed analysis of the responses is given in Table 1. 12.10% of the experts in the first round, 40% in the second round, and 22.22% in the third round were both clinicians and researchers.

Round 1

The first survey round consisted of 21 questions, and with the exception of 5 questions about demographic information of the experts, consensus was reached on 8 questions. Of these, 3 were related to assessment, and 5 to treatment.

Of the assessment scales used, the experts agreed on the usage of the Neck Disability Index (NDI) (72.72%) and the Visual Analog Scale (VAS) (72.72%). Flexion-Rotation Test (FRT) (100%) and cervical Range of Motion (ROM) (75.78%) were the most commonly used physical assessment methods for the evaluation of cervicogenic headache patients. The most common parameters to evaluate the success of physiotherapy and rehabilitation for cervicogenic headache were personal factors (e.g. lifestyle, habits, social background, education, race/ethnicity) (87%), painkiller usage (72.72%), and activity (78.78%).

93.93% of the participating agreed on the use of exercise therapy. The most commonly used exercises were Mulligan home exercise (70.96%) and strengthening of deep cervical flexors (74.19%). There was consensus that no manipulation was performed (75.75%). In the first round, there was no consensus on whether there were contraindications for physiotherapy and rehabilitation in individuals with cervicogenic headache. However, according to experts who stated contraindicated conditions, these were that physiotherapy should

not be applied in cases of vertebrobasilar insufficiency (78%), cervical spine infection (73.68%), or neurological deficit (78%).

Round 2

The second round consisted of a total of 26 questions consensus was reached on 15 questions. In 8 of these questions, consensus had already been reached in the first round. In the second round, consensus was continued on the use of VAS, and consensus was reached with the use of the Numeric Rating Pain Scale (NPRS) (83%) instead of NDI (66.66%) (Table 2). Painkiller usage (93.33%) and activity (80%) were the most frequently evaluated parameters for the success of the treatment. Consensus was reached that certain conditions in cervicogenic headache were contraindications for physiotherapy and rehabilitation (73.3%) (Table 3).

Table 2. Items Evaluation in Cervicogenic Headache and Added in 2. Round

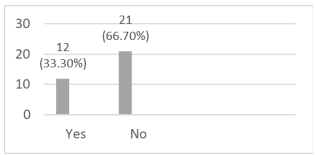
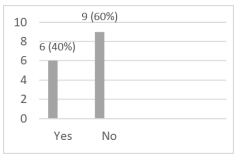
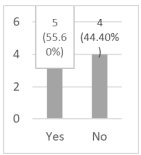
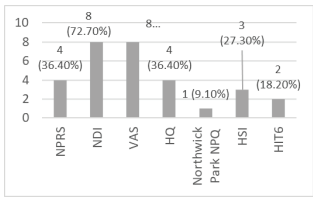
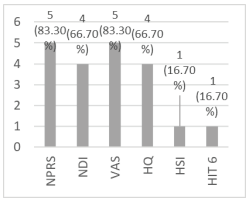
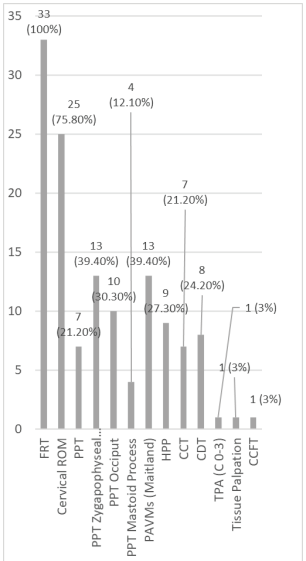
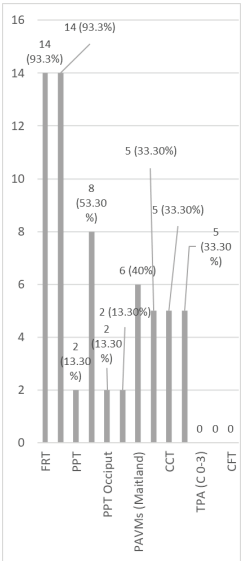
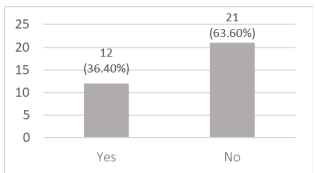
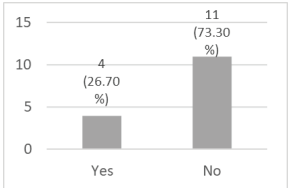
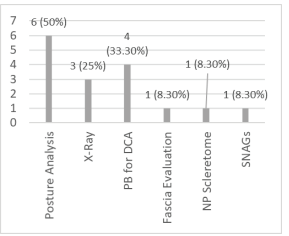
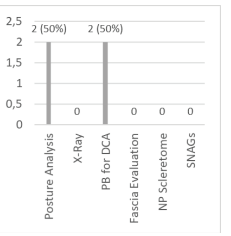
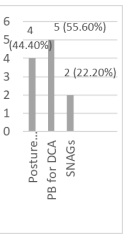
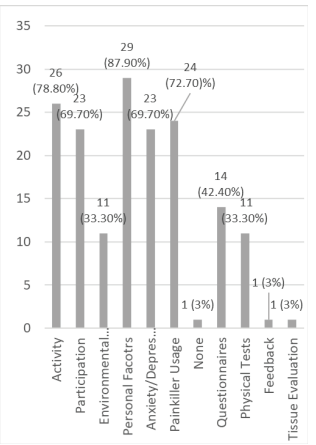
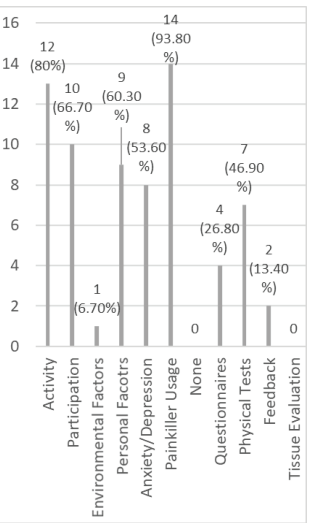
	Round 1	Round 2	Round 3
1.Do you use any questionnaire to evaluate cervicogenic headache?			
2. If yes, what is/are their name/names?			
3.What physical tests do you use to assess cervicogenic headache?			
4.Do you use another method to evaluate cervicogenic headache?			

Table 2. (Continuous) Items Evaluation in Cervicogenic Headache and Added in 2. Round

	Round 1	Round 2	Round 3
5.If yes; which method/ methods?			
6.How do you evaluate the success of treatment in cervicogenic headache?			

CCT: Cervical Compression Test, CDT: Cervical Distraction Test, CCFT: Cranio Cervical Flexion Test, DCA:Deep Neck Flexors Activation, FRT:Flexion-Rotation Test, HIT6: Headache Impact Test-6, HQ: Headache Questionnaire, HIS: Headache Severity Index, NDI: Neck Disability Index, NPQ: Neck Paib Questionnaire, NPRS: Numerical Pain Rating Scale, PAVMs: Posterior Anterior Vertebral Mobilization, PB: Pressure Biofeedback, PPT: Pressure-Pain Treshold, ROM:Range of Motion, TPA:Trigger Point Assessment, VAS:Visual Analog Scale

In the second round, consensus was reached in 4 of the 9 newly added questions. The first of these questions was re-assessment of the patient after discharge (73.33%). The remaining 3 questions were related to the details of Mulligan mobilization (Table 3).

Round 3

The last round consisted of a total of 9 questions in addition to the demographic information of the certified Mulligan Practitioners. In this round, the questions were only those for which consensus could not be reached in both the previous rounds. Only one of these questions reached consensus (Table 3), which was that patients should be re-evaluated 1 month after discharge (75%). No other consensus was reached.

DISCUSSION

This study was designed to identify the common assessment and rehabilitation methods used by physiotherapists with CMP for cervicogenic headache, using the Delphi technique. Consensus was reached in 8 questions in the first round, in 15 questions in the second round, and in 1 question in the third round. As a result, a total of 16 key messages were determined. These key messages may provide insights and guidance to those working with cervicogenic headaches on Mulligan Concept and other physiotherapy and rehabilitation approaches around the world.

Assessment in cervicogenic headache

Numerous complex neural networks are thought to play an important role in the cervical-trigeminal nucleus in cervicogenic headache. Furthermore, the communication between the three upper cervi-

Table 3. Items About Treatment of Cervicogenic Headache and Added in 2. Round

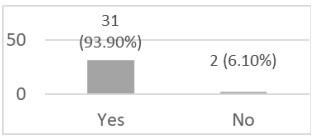
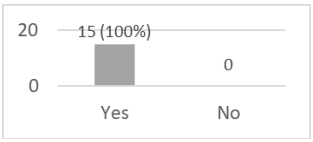
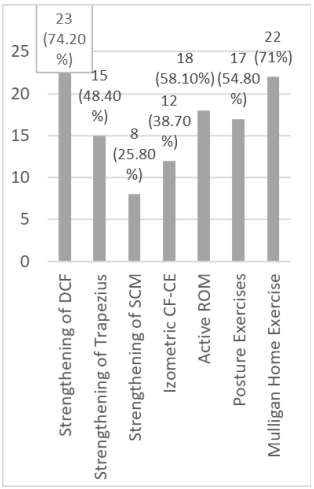
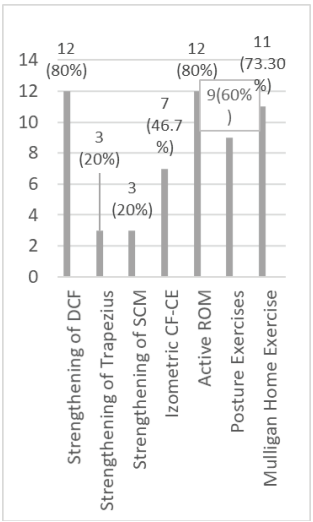
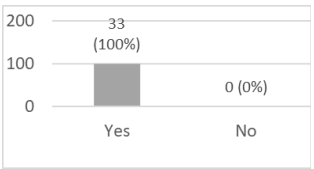
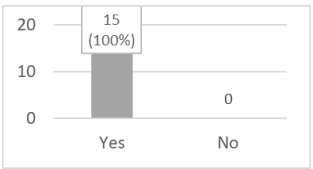
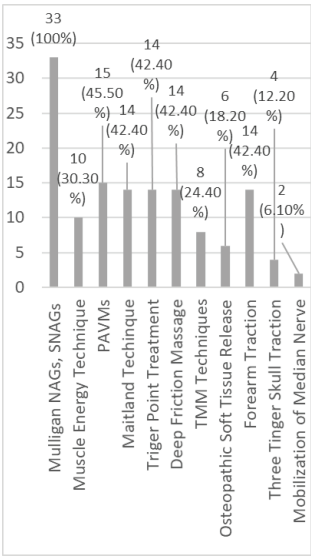
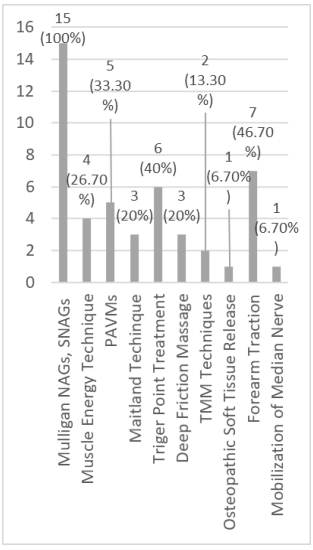
	Round 1	Round 2	Round 3
7.Do you practice exercise training in the treatment of cervicogenic headache?			
8.If yes; which exercises?			
9.Do you do mobilization in the treatment of cervicogenic headache?			
10.If yes; which techniques?			

Table 3. (Continuous) Items About Treatment of Cervicogenic Headache and Added in 2. Round

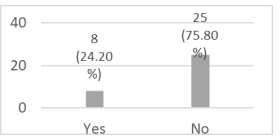
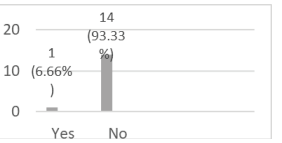
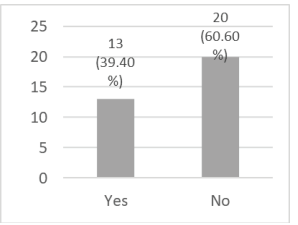
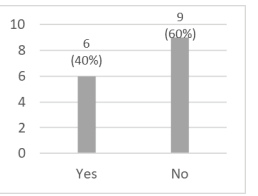
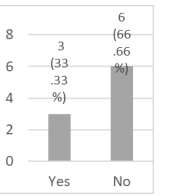
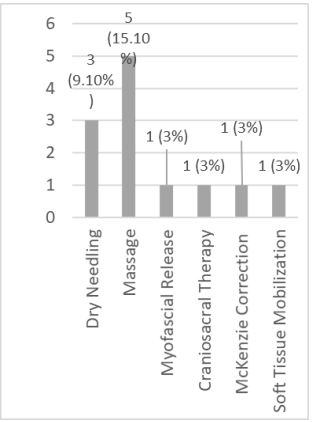
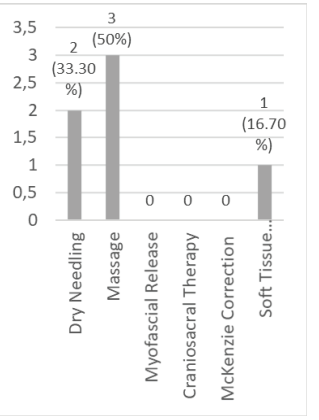
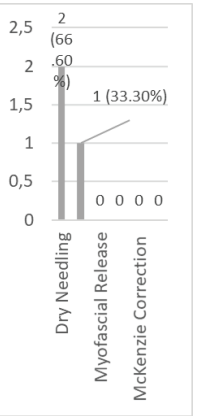
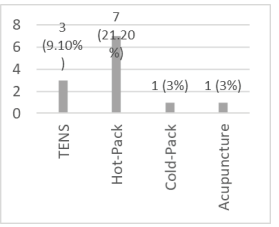
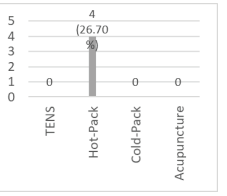
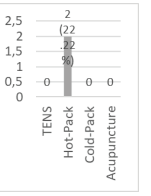
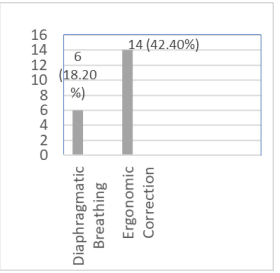
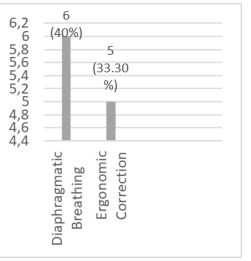
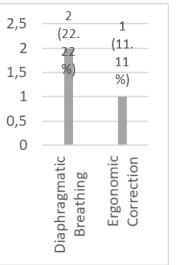
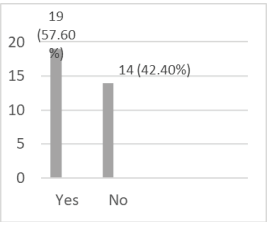
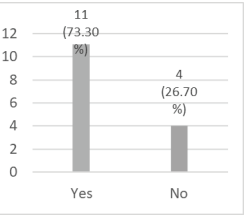
	Round 1	Round 2	Round 3
11.Do you execute manipulation in the treatment of cervical headache?			
12.Are you using any manual techniques other than these in the treatment of cervicogenic headache?			
13.If yes; which technique/techniques?			
14.Do you use the following agents in the treatment of cervicogenic headache?			
15.Which methods do you use in these options?			
16.Are there any cases of contraindication for Mulligan mobilization in cervicogenic headache?			

Table 3. (Continuous) Items About Treatment of Cervicogenic Headache and Added in 2. Round

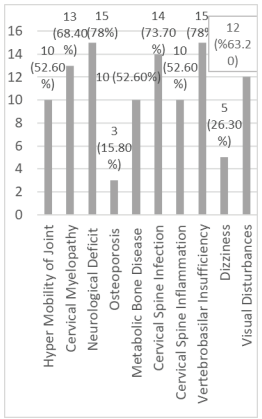
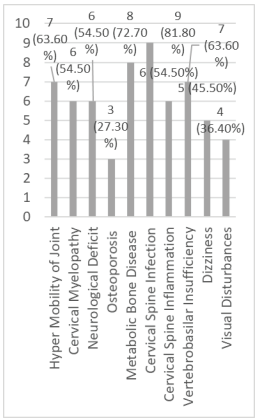
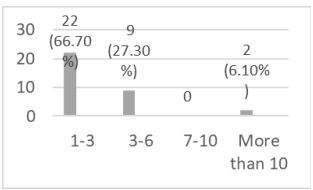
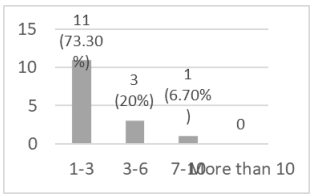
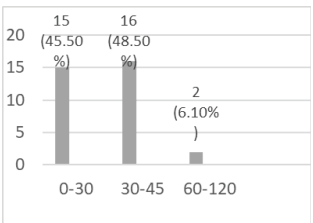
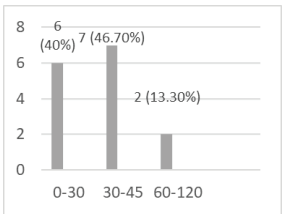
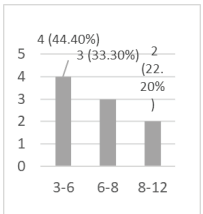
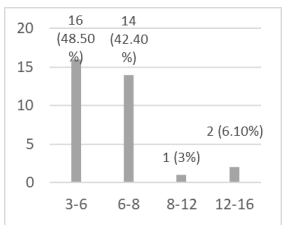
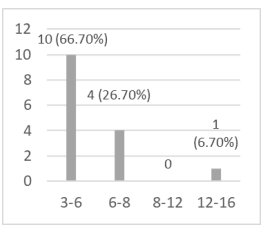
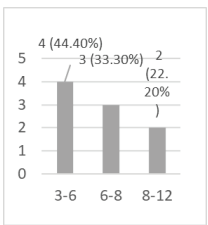
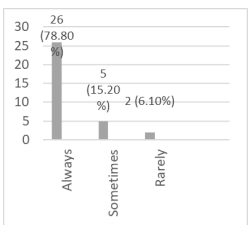
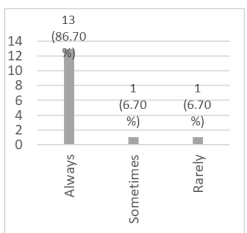
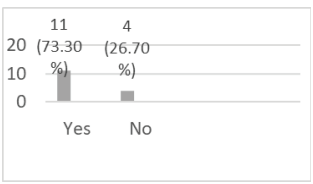
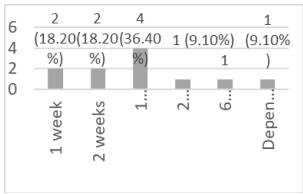
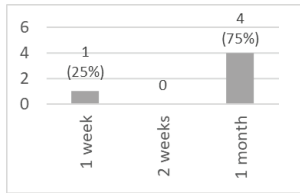
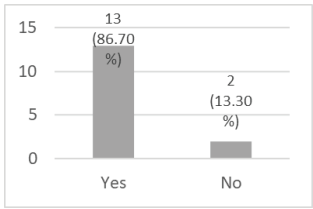
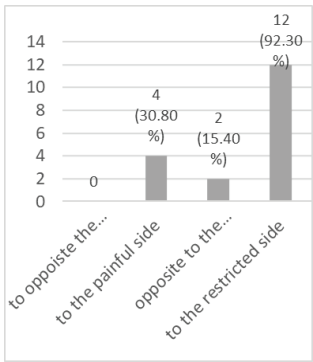
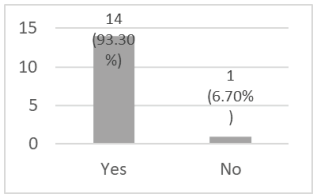
	Round 1	Round 2	Round 3
17.If yes; which cases?			
18.What is the number of treatment sessions of cervicogenic headache?			
19.What should be the average session time of the treatment of cervicogenic headache?			
20.What is the duration of treatment for cervicogenic headache?			
21.Is the patient educated in cervicogenic headache (giving information about the treatment and disease)?			
22.Do you re-evaluate your patients for post-discharge			

Table 3. (Continuous) Items About Treatment of Cervicogenic Headache and Added in 2. Round

	Round 1	Round 2	Round 3
23.If yes; which frequency?			
24.Do you ask the patient to perform cervical rotation while applying SNAG technique in Mulligan			
25.If yes; which direction?			
26.Do you think Mulligan mobilization has a long-term effect?			

PAVMs: Posterior Anterior Vertebral Mobilizations, SNAGs: Sustained Natural Apophyseal Glides, TENS: Transcutaneous Electrical Nerve Stimulation, TMM:Temparomandibular Mobilization

cal nerves and the trigeminal afferent-efferent is bi-directional (12). All these connections make it difficult to distinguish cervicogenic headache from other types of headache.

In a systematic review of evaluation options in individuals with cervicogenic headache, it was stated that the highest validity and reliability test for diagnosis was FRT (13). In the current study, FRT was the most commonly used physical test in both rounds and in the first round, it was seen that cervical ROM evaluation was used by 75.8% of the experts.

There are some studies in literature that have used questionnaires and scales to evaluate the efficacy of physiotherapy and rehabilitation in cervicogenic headache. However, a wide range of different questionnaires and scales were used in the studies (14,15). According to the current study results, VAS, NDI, and NPRS are the most frequently used questionnaires. Consensus was reached, especially in the use of VAS, in both rounds. In this study, the responses to the item "How do you evaluate the success of treatment in cervicogenic headache?" were personal factors, activity, and painkiller usage. As the effectiveness of painkillers is very short and there are many side-effects, the goal should be to reduce the usage of painkillers. Therefore, it

can be considered important to evaluate the usage of painkillers in determining the effectiveness of the treatment. In addition, recent studies of pain have emphasized the importance of evaluating the patient under the International Classification of Functioning, Disability, and Health (ICF) (16,17). In this context, the evaluation of personal factors and activity should be considered necessary for a biopsychosocial approach. In the literature, it has been stated that cervicogenic headaches can recur after various interventional and medical treatments (15). But, no responses could be found to the questions of "Do patients whose treatment is completed need to be checked again?" or "How often should patients be re-evaluated?". The results of this survey showed that for the question of "Do you re-evaluate your patients post-discharge?", which was added in the second round, the physiotherapists with CMP agreed as "Yes". Furthermore, their opinions about the frequency of this re-evaluation were clearly at 1 month.

Rehabilitation in cervicogenic headache

According to a systematic review, manual treatment techniques, scapular muscle strengthening, and cervical region-specific strengthening exercises may be the effective combination (15). Our results also show that manual and exercise therapy were frequently used by physiotherapists with CMP for cervicogenic headache. As expected, all participants were actively using Mulligan mobilization. Since this was the inclusion criterion, it was not considered a consensus. However, it was questioned to determine whether the participants were actively using Mulligan mobilization. In both rounds, physiotherapists with CMP agreed that the exercise component would be included in the treatment. Mulligan home exercise, deep cervical flexor strengthening, and active ROM exercises were the most commonly used exercises. Previous studies have also shown the positive effects of deep cervical strengthening exercises and Mulligan home exercise (18,19). In this respect, the results of the current study are consistent with the literature. The fact that all participants were using Mulligan mobilization in this Delphi study may have affected the conclusion that Mulligan home exercise was frequently used. However, Said et al. emphasized that the results of Mulligan home exercise and mobilization performed by the physiotherapist have similar effects (20). From this point of view, it is not surprising that Mulligan home exercise, which provides self-mobilization generally due to ease of application at home, is frequently used.

A systematic review in 2016 suggested that spinal manipulation significantly reduces symptoms in individuals with cervicogenic headache (21). Dunning et al. (2016) stated that manipulation is more effective than mobilization (14). However, it was concluded that the experts involved in this study did not use manipulation to a large extent. Experts may prefer not to use spinal manipulation because of the risk of adverse events, which have been frequently mentioned in the literature (22, 23).

In some studies, manual therapy was reported to be contraindicated when there are problems such as cervical hypermobility, osteoporosis, metabolic disease, neurological deficit, cervical myleopathy and vertebrobasilary artery insufficiency, and these have therefore been determined as exclusion criteria(24). However, to the best of our knowledge, no studies have reporting contraindicated conditions for physiotherapy applications other than manual therapy. According to the physiotherapists with CMP in the current study, there was a consensus that physiotherapy should not be applied in the presence of vertebrobasilar insufficiency, cervical spine infection, neurological deficit, and metabolic bone disease. However, there is a need for more detailed studies on which physiotherapy approaches are contraindicated for cervicogenic headache.

Recent studies have highlighted the importance of patient self-management in the treatment of chronic pain. Self-management improves lifestyle modifications and the patient's ability to cope with symptoms. The patient plays a central role in the treatment, so may easily overcome some of the barriers that prevent the maintenance of requirements such as exercising and increasing the level of physical activity (25). To the best of our knowledge, no studies have examined the effect of patient education on cervicogenic headache. Therefore, the physiotherapists with CMP were asked "How often do you educate the patient on cervicogenic headache (information about treatment and disease)?". Consensus occurred as "always" in the first and second rounds. From this conclusion, con-

sidering the possibility of recurrence and chronicity, patient education can be seen to be necessary for patients with cervicogenic headache. No answers could be found in the literature to the questions of "Should the people with cervicogenic headache be re-checked after discharge?" and "What should be the frequency?". The experts agreed that patients should be checked at 1-month intervals after discharge. Since all of the experts participating in the study applied Mulligan mobilization, questions about the details of Mulligan mobilization applications for cervicogenic headache were added in the second round. In the literature, it is seen that the use of SNAG technique is common in individuals with cervicogenic headache, and this technique is often used with cervical rotation in the direction of the restricted rotation (26-28). The official SNAG definition of the Mulligan Concept states that the technique is performed with cervical rotation (29). However, some studies have indicated that the SNAG technique is applied without using cervical rotation (9,10). According to the results of the current study, the SNAG technique should be applied with cervical rotation in the direction where movement is restricted. In this respect, the current study results are consistent with the majority of studies in the literature and the official definition of the technique in the Mulligan Concept.

Limitations

The number of experts involved in the study seems to be low. But, this could be due to the low number of physiotherapists with Certified Mulligan Practitioner working on cervicogenic headaches. Şahin et al. stated that the minimum number of participants in a Delphi study should be 7 (30). For these reasons, it was thought that the sample size would be sufficient. In addition, the Mulligan home exercise recommendation should be interpreted with caution, given that all participants in the study used Mulligan mobilization.

CONCLUSION

In conclusion, beside Mulligan Concept, many assessment and rehabilitation methods are also used by physiotherapists with CMP in cervicogenic headache. Of these assessment methods, VAS, NDI, FRT, and ROM are the most frequently preferred. In addition, painkiller usage, personal factors, and activity are usually evaluated. In addition to Mulligan mobilization (SNAG technique with cervical rotation), exercise therapy and patient education were seen as the most frequently used treatment options. Vertebrobasilar insufficiency, cervical spine infection and neurological deficit were determined as contraindications to physiotherapy for cervicogenic headache. However, consensus has still not been reached on some questions. For people with cervicogenic headache, patient education, manual therapy approaches, and exercise applications are thought to contribute to the effectiveness of the treatment and decrease the symptoms of the patient.

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Conflict of Interest: No

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Informed Consent: Not necessary

Author Contributions: Yasemin Özel Aslıyüce: Design, Data collecting and processing, Literature review, Writing Özlem Ülger: Concept, Design, Data collecting, Processing, Critical review

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