

Development and validation of a questionnaire to find usage patterns and beliefs about therapeutic ultrasound among physiotherapists in Delhi NCR

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Abstract

Background: Musculoskeletal injuries are commonly faced problems. With technological advancement and sedentary lifestyle, its prevalence is increasing every day. Till a few years ago pharmacotherapy was the mainstay of treatment, but as awareness is increasing; Physiotherapy is emerging as one of the effective non-pharmacological treatment approaches. Physiotherapy is an application of manual therapy and electrotherapy for the correction of pain and bodily dysfunctions. Therapeutic ultrasound is a commonly used electrical modality in physiotherapy setups. Evidence suggests a strong beneficial effect of it on musculoskeletal pains and injuries. The Indian Physiotherapy practice has its own modification as per cultural and social influence. There are various setup models like private clinics, hospital setups, institution-based OPD, etc. As they work in different clinical setups, the beliefs about the usage of ultrasound also vary among them. So, the current study aims to develop a questionnaire to find usage patterns and beliefs about therapeutic ultrasound and to establish the content validity of the same.

Results: The questionnaire was developed through an extensive literature search done by different search engines with therapeutic ultrasound, parameters, and Physiotherapists as the keywords used. The final draft of the questionnaire once formed was assessed for content validity. Lawshe's method of content validity was used in which the questionnaire was sent to 5 panelists included in the study based on inclusion criteria and their opinion on each item was taken. A content validity ratio was calculated as 0.72. Indicating a moderate content validity of the questionnaire formulated.

Conclusion: Using Lawshe's method, a questionnaire with two sections on usage patterns and beliefs about therapeutic ultrasound in physiotherapists of Delhi/NCR was formulated with moderate content validity. Future work will determine the scoring method for using this tool, interrater reliability, and predictive validity to facilitate optimal utilization of such questionnaire in clinical and academic practice.

Keywords- Therapeutic ultrasound; Usage pattern; Beliefs; Physiotherapists; Delhi/NCR; Content validity

1. Introduction

Musculoskeletal injuries are commonly faced problems. The prevalence of musculoskeletal pain was found to be 25.9%. (Bihari, kesavachandran, pangtey, Srivastava & mathur 2011). Pharmacotherapy is the mainstay treatment for managing most pain types and conditions; however, it is associated with considerable adverse effects and costs. Physiotherapy is one of the effective nonpharmacological treatment approaches.

According to WCPT (World confederation for physical therapy), physiotherapy is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention,

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treatment/intervention, habilitation, and rehabilitation. Further, the Delhi council for physiotherapy and occupational therapy defines physiotherapy as a physiotherapeutic system of medicine that includes examination, treatment, advice, and instructions to any person preparatory to or for the purpose of or in connection with movement dysfunction, bodily malfunction, physical disorder, disability, healing and pain from trauma and disease, physical and mental conditions using physical agents including exercises, mobilization, manipulation, mechanical and electrotherapy, activity, and devices, or diagnosis, treatment, and prevention.

It solely focuses on physical agents and manual therapy-based protocol rather than pharmacological and surgical treatment. In electrotherapy, modalities are used like Ultrasound, Interferential therapy, Transcutaneous electrical nerve stimulation, short wave diathermy, Microwave diathermy, and LASER (light amplification by stimulated emission of radiation), etc. The therapeutic US is one of the most commonly used electro-physical modalities for the management of musculoskeletal injuries. In almost every physiotherapy setup, ultrasound is used. There have been studies done that say that ultrasound is widely used by physiotherapists. (Chipchase, Trinkle 2003) (Salian, Rane, Yardi 2014). Further, it has been identified as a central component of physical therapy practice in various parts of the world (Olivo, Fuentes, Muir, Gross 2013).

Ultrasound refers to mechanical vibrations which are essentially the same as sound waves but of a higher frequency and is used for pain relief and healing of soft tissues. It is used in the treatment of various conditions like bursitis, tendonitis, frozen shoulder, arthritis, ligament sprain, etc. Various parameters for different conditions are used according to the desired effects. The therapeutic US has a long history of use in physical therapy practice; its clinical application has evolved over the past several decades, from being used as a thermal modality to being employed for its non-thermal effects, particularly in tissue repair and wound healing.

The effectiveness of therapeutic US has been claimed for a variety of conditions including wound healing, soft-tissue lesion management, increasing soft-tissue extensibility, remodeling scar tissue, pain relief, and further diagnosing stress fractures. (Olivo, Fuentes, Muir, Gross 2013). There is a conflicting result about the effect of ultrasound when compared with the placebo effect (Robertson, Baker 2001). Chipchase et al. in their study also reported that physiotherapists in South Australia perceived ultrasound to be effective in creating a placebo effect and it is perceived to be effective when combined with other physiotherapy techniques. Overall, the results of clinical studies have been mixed; only a few well-designed clinical studies have demonstrated positive effects on clinical outcomes.

It has been noticed that worldwide physiotherapists highly value the therapeutic US. There are few studies done in past on usage patterns and beliefs about Therapeutic. The Indian Physiotherapy practice has its own modification as to cultural and social influence. There are various setup models like private clinics, hospital setups, institution-based OPD, etc. As they work in different clinical setups, the beliefs about the usage of ultrasound also vary among them.

Beliefs are the assumptions and convictions that are held to be true, by an individual or a group, regarding concepts, events, people, and things. It is a cognitive process resulting in a concrete cognition of how we think things are. The belief of an individual has an impact on his/her actions in any given situation. This stands true not only for personal life but also for professional life. Attitude and belief are important factors that influence clinical decision-making and the treatment of patients. According to the theory of planned behavior, behavior is determined by the attitudes and beliefs that a person has about the likely consequences of the behavior.

Thus, it becomes important to find the usage pattern and beliefs about the therapeutic US in our Physiotherapists in depth. Further. As there is no central council and standard educational pattern followed in India it is also critical to know the knowledge, usage pattern, and belief of therapeutic US. Thus, this study was designed to develop a questionnaire to evaluate the usage patterns and beliefs about therapeutic ultrasound among physiotherapists in Delhi NCR and to establish its content validity.

2. Methods

The present study is a development and validation study, the development of 14 item questionnaire was done through a literature search of PUBMED, GOOGLE SCHOLAR, and RESEARCH GATE and was adapted from a questionnaire on the use and effectiveness of therapeutic ultrasound. (Chipchase, Trinkle .2003) and Physical Therapists Usage and Beliefs Regarding Therapeutic Ultrasound: A Survey of Therapists in Alberta (Olivo, Fuentes, Muir, Gross 2013).

To establish content validity, Lawshe's method was used with 5 Physiotherapists having more than 5 years of experience included as panelists.

As a process of validation, the developed questionnaire was sent to panelists offline (by hand) and online (through the e-mail), each item was evaluated as essential, useful but not essential, or not necessary along with remarks regarding the formulation and language. In response to the results received a second round of evaluation was done. A final draft was prepared and the content validity ratio was evaluated.

3. Results and discussion

Table 1 Demographic Data of Panelists

S no.	Years of Experience
Panelist 1	14 years
Panelist 2	15 years
Panelist 3	18 years
Panelist 4	18 years
Panelist 5	15 years

Table 2 Panelist response (Lawshe's method)

Item no.	Panelist 1	Panelist 2	Panelist 3	Panelist 4	Panelist 5	ne	CVR= (ne-n/2)/n/2
1 to 7	E	E	E	U	E	4	0.6
8	E	E	E	E	E	5	1
9	E	U	U	E	E	3	0.5
10	E	U	E	U	E	3	0.5
1	E	U	E	E	E	4	0.6
1a	E	U	E	E	E	4	0.6
1b	E	E	U	E	E	4	0.6
1c	E	E	E	E	U	4	0.6
2	E	E	U	E	U	3	0.5
3	E	E	U	E	U	3	0.5
4	E	E	U	E	E	4	0.6
5	E	E	E	E	E	5	1
6	E	E	U	U	E	4	0.6
7	E	E	E	E	E	5	1
7a	E	E	E	E	U	4	0.6
8	E	E	E	E	E	5	1
9	E	E	E	E	E	5	1
9a	E	E	U	U	E	3	0.5
10	E	E	U	E	E	4	0.6
11	E	E	U	E	E	4	0.6
11a	E	E	U	E	E	4	0.6
12a	E	E	E	U	E	4	0.6

12b	E	U	E	E	U	3	0.5
12c	E	U	E	E	E	4	0.6
12d	E	U	E	E	U	3	0.5
12e	E	E	E	E	E	5	1
12f	E	U	E	E	E	4	0.6
12g	E	E	E	E	E	5	1
12h	E	U	E	U	E	3	0.5
12i	E	E	E	E	E	5	1
13a	E	E	E	E	E	5	1
13b	E	E	E	E	E	5	1
13c	E	E	E	E	E	5	1
13d	E	E	U	E	E	4	0.6
13e	U	E	E	E	U	3	0.5
13f	E	E	E	E	E	5	1
13g	U	E	E	U	E	3	0.5
13h	E	E	E	E	E	5	1
13i	E	E	E	E	E	5	1
13j	U	U	E	E	E	3	0.5
13k	E	E	E	E	E	5	1
13l	E	E	E	E	E	5	1
14a	E	U	U	E	E	3	0.5
14b	E	E	U	E	E	4	0.6
14c	E	U	E	E	E	4	0.6
14d	E	U	E	E	E	4	0.6
14e	E	E	E	E	E	5	1
14f	E	E	E	E	E	5	1
14g	E	E	E	E	E	5	1
14h	E	U	E	E	E	4	0.6
14i	E	U	E	E	E	4	0.6
14j	E	E	E	U	U	3	0.5
14k	E	U	E	E	E	4	0.6
14l	E	E	E	E	E	5	1
							0.724074

Essential (E); Useful but not essential (U); Not necessary (NE)

With these assumptions in mind, the following formula for the content validity ratio (CVR) was devised: $CVR = \frac{n_e - (N/2)}{N/2}$ in which the n_e is the number of panelists indicating "essential" and N is the total number of panelists.

$$CVR = \frac{n_e - (N/2)}{N/2}$$

The CVR calculated was 0.72, which establishes a moderate content validity. The present study is the first to evaluate a therapeutic modality in terms of usage patterns and beliefs amongst Indian Physiotherapists. The study formulated a questionnaire that can be used at the clinical and academic level for creating a uniformity of practice for the usage of such modalities and will improve the conviction with which such electrotherapeutic modalities are used. A similar study was done by Susan et al, 2013 who performed a population-based cross-sectional study among Canadian Physical Therapists by formulating the questionnaire and evaluating the content validity through the Delphi process.

4. Conclusion

Physiotherapy practice in India is a combination of electrotherapy with or alone exercise therapy and manual therapy. The present study formulates a questionnaire that can be used at the clinical and academic level to understand the usage pattern and beliefs about therapeutic ultrasound, an electrotherapeutic modality widely used and in the long term might be used to establish common practice guidelines.

Compliance with ethical standards

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Disclosure of conflict of interest

No Conflict of interest

Statement of ethical approval

Amar Jyoti institution review board- Ethical clearance (AJIRB-EC).

References

- [1] Leighton, T. G. (2007). What is ultrasound? Progress in biophysics and molecular biology, 93(1-3), 3-83.
- [2] de Brito Vieira, W. H., Aguiar, K. A., Da Silva, K. M., Canela, P. M., Da Silva, F. S., & Abreu, B. J. (2012). Overview of ultrasound usage trends in orthopedic and sports physiotherapy. Critical ultrasound journal, 4(1), 1-8.
- [3] Warden, S. J., & McMeeken, J. M. (2002). Ultrasound usage and dosage in sports physiotherapy. Ultrasound in medicine & biology, 28(8), 1075-1080.
- [4] Shanks, P., Curran, M., Fletcher, P., & Thompson, R. (2010). The effectiveness of therapeutic ultrasound for musculoskeletal conditions of the lower limb: A literature review. The Foot, 20(4), 133-139.
- [5] Speed, C. A. (2001). Therapeutic ultrasound in soft tissue lesions. Rheumatology, 40(12), 1331-1336.
- [6] Armijo-Olivo, S., Fuentes, J., Muir, I., & Gross, D. P. (2013). Usage patterns and beliefs about therapeutic ultrasound by Canadian physical therapists: an exploratory population-based cross-sectional survey. Physiotherapy Canada, 65(3), 289-299.
- [7] Robertson VJ, Baker KG. A review of therapeutic ultrasound: effectiveness studies. Phys Ther. 2001, 81(7):1339-50. Medline, 11444997 2.
- [8] Watson T. Ultrasound in contemporary physiotherapy practice. Ultrasonics. 2008, 48(4):321-9. <http://dx.doi.org/10.1016/j.ultras.2008.02.004>. Medline, 18466945 3. Lindsay DM, Dearness J, McGinley CC.
- [9] Electrotherapy usage trends in private physiotherapy practice in Alberta. Physiother Can. 1995, 47(1):30-4. Medline:10140421
- [10] Pope GD, Mockett SP, Wright JP. A survey of electrotherapeutic modalities: Ownership and use in the NHS in England. Physiotherapy. 1995, 81(2):82-91.
- [11] Robertson VJ. Dosage and treatment response in randomized clinical trials of therapeutic ultrasound. Phys Ther Sport. 2002, 3(3):124-33. 43. Stevenson K, Lewis M, Hay E.
- [12] Do physiotherapists' attitudes towards evidence-based practice change as a result of an evidence-based educational program? J Eval Clin Pract. 2004, 10(2):207-17.