

Questionnaire for Physiotherapists Disaster Health Management Core Competencies: A Preliminary Content and Face Validity Study

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ABSTRACT

Introduction: The healthcare system faces substantial challenges from disasters that require proactive healthcare practitioners, including Physiotherapists, to lead disaster prevention, preparedness, response efforts, and recovery initiatives. Physiotherapists require validated competencies for effective disaster health management, but there is a lack of standard tool.

Aim: The present study aimed on developing the core competencies questionnaire possessed by the Physiotherapists for disaster health management and seeks the preliminary content and face validation of the questionnaire.

Materials and Methods: The present methodological study was exploratory mixed method research to design and psychometrics the instrument measuring disaster health management competencies of Physiotherapists in India conducted from 25-09-2023 to 28-02-2024 at Galgotias University, Greater Noida, India. The content validity of the questionnaire through two phases: questionnaire development and judgement. The development phase involved identification of constructs, followed by item generation and instrument formation. A seven-member expert panel did the judgement of the questionnaire with the Delphi method approach. After three rounds of panel discussions and based on expert comments, the questionnaire was modified and

assessed for Content Validity Ratio (CVR), Item Content Validity Index (I-CVI), and Questionnaire/scale Content Validity Index (S-CVI). Further kappa statistics were performed for inter-rater reliability among experts through using IBM Statistical Package for Social Sciences (SPSS) statistics for windows version 27 (IBM Corp, Armonk, NY, USA). Final face validation was done through percentage agreement on experts' comments.

Results: The CVR analysis of 104 items produced 39 items with CVR higher than 0.99. Knowledge received 13 items and skills received 14 items while attitude included 12 items as the main constructs. The expert panel unanimously supported all chosen items because their I-CVI scores rested between 0.8 and 1. The calculated S-CVI score reached 0.95, which indicates high content validity for the questionnaire. The expert panel achieved good to very good agreement when rating construct clarity at 0.622, yet simplicity obtained very good agreement at 0.748, along with relevance scoring only moderate agreement at 0.404. The results from face validation showed that 97% of experts agreed on the items.

Conclusion: Preliminary content and face validity assessment demonstrate suitable quantity indices for the tool. The research gives guidance for future psychometric testing of this new assessment questionnaire to evaluate Physiotherapists' disaster health management competencies.

Keywords: Emergency response, Face validity, Physiotherapy, Rehabilitation

INTRODUCTION

The world has witnessed a rise in both the number and intensity of natural and man-made disasters during recent decades which currently tests healthcare systems worldwide [1,2]. Disasters are characterised as natural or man-made, depending on their causes. Human-caused disasters include rail or plane wrecks, explosions, terrorism with biological or chemical weapons, and conflicts [3]. Natural and man-made disasters cause complex health problems which include traumatic injuries together with persistent physical disabilities that need multiple healthcare disciplines to treat them [4]. The goals of disaster health management are to prevent or lessen the risks of harm, provide prompt and sufficient aid to individuals impacted by disasters, and enable prompt and effective recovery [5,6].

The significance and function of disaster rehabilitation services in disaster management have received more attention lately. Rehabilitation needs were frequently overlooked during previous disasters, which prioritised acute response plans aimed at treating acute injuries and saving lives [7,8]. In many catastrophe-prone developing nations, rehabilitation-inclusive disaster response strategies and rehabilitation services were either non-existent or insufficient. As per Emergency Medical Team (EMT) project and World Health Organisation's (WHO), rehabilitation is a crucial part of medical response and patient-centred treatment in disaster situations [8,9].

Recent advances in physiotherapy research, education, and practice have led to Physiotherapists assuming new emergent responsibilities, as an allied healthcare professionals help the medical team during any catastrophic health crisis [10-12]. Physiotherapists are playing essential role in coordinating the field medical team's rehabilitation activities after a disaster because they are specialists in disabilities and function and have received training in the evaluation and management of general health issues [13,14]. In critical and ward settings, Physiotherapists treat acute orthopaedic trauma, wounds, respiratory conditions, and triage. They provide care for a range of victims during disasters, such as burns, respiratory issues, critical cases, and musculoskeletal and orthopaedic injuries [13,15].

An intricate blend of knowledge, attitudes, and skills exhibited by people that are essential to an organisation's successful and efficient operation is known as a competency [16-18]. For the health workforce to successfully carry out crucial public health tasks like promoting health or assessing circumstances like disaster health management, they must have core competencies, which are critical knowledge, skills and attitudes [18-20]. Physiotherapists must have core physiotherapy competences while dealing with disasters [21,22]. These disaster competences of health professionals, whether together or individually, are accessible on a variety of questionnaires. The research shows that there is barely any consideration for mapping physiotherapist roles and abilities for disaster health

management [23]. The study's aim was to create a disaster health management questionnaire for Physiotherapists and to evaluate the questionnaire's content validity, reliability, and face validity.

MATERIALS AND METHODS

The present methodological study was exploratory mixed method research to design and psychometrics the instrument measuring disaster health management competencies of Physiotherapists in India conducted from 25-09-2023 to 28-02-2024 at Galgotias University, Greater Noida, India. Ethical clearance was obtained from Departmental Ethics Committee, Department of Physiotherapy, Galgotias University with reference number DEC/FEA/PT/03/23 and the study was prospectively registered with Clinical Trial Registry India-CTRI/2023/09/057735. This commentary found in (Physiotherapy - The Journal of Indian Association of Physiotherapists) utilises the theoretical foundation from the competence study but it avoids repeating either the research findings or data. The aforementioned original article will report comprehensive findings and results from the competencies validation study when it gets accepted for publication [24].

Step 1: Identification of Constructs

The development phase involved identification of constructs, followed by item generation and tool formation. At the stage of determining the content domain and creating items, Ridenour and Newman's mixed technique (deductive-inductive) for conceptualisation was applied [25].

The items were based on the competency constructs identified through literature [26-28]. As per the American Physical Therapy Association (APTA) guidelines of disaster management for Physiotherapists [22,23] and the competency framework [16,20,29,30], a closed-ended questionnaire was created. The first draft of the Physiotherapist's Disaster Health Management Core Competencies questionnaire (PDHMCCS) questionnaire was framed. The initial 104 items in the draft questionnaire were grouped into three domains (Disaster Knowledge, Skills and Attitude) and handed over to the experts for the judgement.

Step 2: Content Validity

Although, five experts are minimally considered for content validation [31]. A seven-member expert panel, chosen through snowball sampling method for the questionnaire's content validation. An informed consent was obtained from the experts. There were seven members in the expert panel including the NGO worker, emergency physician, emergency nurse, clinical physiotherapist, resident physiotherapist, social health worker, and hospital administrator. They were BA, MA {Non-Governmental Organization (NGO) Management}; MBBS, MD (Emergency Medicine); BSc, MSc. BPT, MPT; masters in social work; and MBBS, MBA-healthcare management. They had a total of 25, 8, 5, 12, 15, 10 and 20 years of experience respectively, comprising a multidisciplinary team with broad expertise in healthcare, rehabilitation, social work, emergency medicine, and hospital administration.

In qualitative content validity method, the expert panel did the judgement of the questionnaire with the modified Delphi method approach [32]. After three rounds of panel discussions and based on expert comments, the draft questionnaire's duplicity of items was removed, items were grammatically modified, sequentially organised and refined [26,31,33].

The Lawshe's method of quantitative approach to content validity, as indicated by the CVR, guarantees confidence in selecting the most important and correct content in an instrument [34,35]. To ascertain whether an item is required in development of the items, experts were interviewed. On a questionnaire of 1 to 3, experts were asked to rank each item as "not necessary," "useful but not essential," or "essential." CVR varies between 1 and -1 [35,36]. Greater agreement among panel members about the significance of a particular item in an instrument is indicated by a higher score.

The formula for the CVR= $(N_e - N/2)/(N/2)$ where N_e is the number of experts who said a certain item was "essential" and N is the total number of experts. The present study with seven panel of experts, a CVR greater than 0.99 indicates an appropriate degree of significance for the item in the measure [35,37].

Followed by CVR, the CVI was investigated using the guidelines of Waltz and Bausell's CVI calculation [38]. Experts evaluated the PDHMCCS for relevancy, simplicity, and clarity as reported in previous study [39]. Seven experts independently evaluated simplicity, relevancy, and clarity by means of four-point Likert questionnaire for each item. For instance, relevancy was categorized as 1 (irrelevant), 2 (somewhat relevant), 3 (relevant), and 4 (totally relevant). Clarity evaluation was done using a questionnaire of 1 (lack of clarity), 2 (somewhat clear), 3 (clear), and 4 (extremely clear). The objects' simplicity was scored as follows: 1(not simple), 2 (somewhat simple), 3(simple), and 4 (extremely simple) [34,38,40]. The I-CVI ratios for item relevance, clarity, and simplicity were determined by dividing the number of experts who rated the items 3 or 4, noted as relevant, clear, or simple, by the total number of assessing experts. The scores of 0.8 -1 were used as the criterion for accepting the items based on their CVI level [41]. Further, CVI for questionnaire (S-CVI) was calculated by two approaches. Firstly, the mean questionnaire level of CVI (S-CVI/Ave) and secondly, universal agreement among experts (S-CVI/UA) was computed using the mean I-CVI score of each PDHMCCS Values of 0.90 and above were considered sufficient for both S-CVI/Ave and S-CVI/UA evaluations. The computation of S-CVI/Ave consisted of dividing the questionnaire's entire item count by summing all I-CVIs [42]. The researchers converted the questionnaire into dichotomous categories before determining S-CVI/UA through combination of values 3 and 4 and values 2 and 1. Each question receives two simple yes/no response categories to match relevant with relevant and irrelevant with irrelevant. The S-CVI/UA calculation requires dividing the total number of items deemed relevant (CVIs of 1) among all experts by the complete item collection of the universal agreement method [35,36,40,41,43].

Step 3: Inter-rater Agreement/Kappa Statistics

The Kappa statistic, also known as inter-rater agreement, is a consensus index that accounts for chance agreement [35,38,44]. It is a crucial addition to the CVI since it offers information about the degree of agreement that goes beyond chance [38,44]. For all 39 questions on the three domains (relevance, clarity, and simplicity), the likelihood of agreement between raters (inter-rater reliability) was assessed using kappa statistics. The inter-rater reliability between seven experts has been examined using Fleiss Kappa statistics. In addition to the agreement in each item (I-CVI), the Fleiss Kappa statistics were calculated for each panel member's score on relevance, clarity and simplicity. According to the agreement scores, kappa values were classified as low (<0.20), fair (0.21-0.40), moderate (0.41-0.60), good (0.61-0.80), and very excellent (0.80-1.0) [35,44,45].

Step 4: Face Validity

In order to achieve quantitative face validity, the questionnaire was modified in response to expert comments and the percentage (%) of expert agreement [46]. To assess quantitative face validity, ten Physiotherapists already have disaster health management experience were asked to determine the need of the items to be add, delete and/or modify on Yes/No pattern. The strength of the agreement was calculated based on the % of agreement of the experts per question and overall questionnaire. If the % agreement of the per question was less than 80%, then it was considered poor agreement and question was restructured, if the agreement fall between 81-90%, then then it was considered substantial agreement and question was revised and if more than 90% agreement was there it was considered full agreement and then question was retained [47].

STATISTICAL ANALYSIS

Data analysis was done using IBM SPSS statistics for windows version 27 (IBM Corp, Armonk, NY, USA). For the content validation, Lawshe's method was used for the CVR calculation and Waltz and Bausell's for CVI calculation, followed by Cohen's Kappa Index and Fleiss' kappa [35,37,38,47]. Patel N and Desai S qualitative method of % percentage agreement on experts' comments was used for face validation [47].

RESULTS

Step 1: Identification of Constructs

The initial draft questionnaire had 104 items, grouped into three domains (Disaster Knowledge, Skills and Attitude) and handed over to the seven experts. The seven expert panel consisted of two Physiotherapists having disaster handling experience, NGO worker, medical social worker, hospital administrator and at last emergency physician and emergency nurse. Further, the 104-item questionnaire underwent for Delphi discussions among experts.

Step 2: Content Validity

Delphi discussions among experts resulted into elimination of 65 items from the initial 104 items, as marked non-essential. The CVR calculated for remaining 39 items. The overall CVR was 1 for all the items, so all the items were retained. The I-CVI of each item on relevance was 0.99, clarity was 1 and simplicity was 0.99. Overall mean I-CVI was 0.99, indicating excellent content validity of all 39 items. The overall S-CVI (S-CVI/Ave and S-CVI/UA) was 0.95, indicating high content validity of the questionnaire. The content validation of the items and questionnaire is shown in [Table/Fig-1].

Step 3: Inter-rater Agreement/ Kappa statistics

Fleiss kappa values for relevance, clarity, and simplicity scores ranged from 0.404 to 0.748. The kappa agreement on clarity (0.622) and simplicity (0.748), which indicated good to very good agreement, while relevance (0.404) indicated moderate agreement. This demonstrated the moderate consensus among experts regarding relevance, although simplicity and clarity were highly regarded, as depicted in [Table/Fig-2].

Items	Expert in agreement			I-CVI (Relevance)	I-CVI (Clarity)	I-CVI (Simplicity)	UA (Relevance)	UA (Clarity)	UA (Simplicity)
	Relevance	Clarity	Simplicity	Relevance	Clarity	Simplicity	Relevance	Clarity	Simplicity
Item 1	7	7	7	1	1	1	1	1	1
Item 2	7	7	7	1	1	1	1	1	1
Item 3	7	7	7	1	1	1	1	1	1
Item 4	7	7	7	1	1	1	1	1	1
Item 5	7	7	7	1	1	1	1	1	1
Item 6	6	7	7	0.85	1	1	0	1	1
Item 7	7	7	7	1	1	1	1	1	1
Item 8	7	7	7	1	1	1	1	1	1
Item 9	7	7	6	1	1	0.85	1	1	0
Item 10	7	7	7	1	1	1	1	1	1
Item 11	7	7	7	1	1	1	1	1	1
Item 12	7	7	7	1	1	1	1	1	1
Item 13	6	7	7	1	1	1	1	1	1
Item 14	6	7	7	0.85	1	1	0	1	1
Item 15	6	7	7	1	1	1	1	1	1
Item 16	7	7	7	1	1	1	1	1	1
Item 17	7	7	7	1	1	1	1	1	1
Item 18	7	7	7	1	1	1	1	1	1
Item 19	7	7	7	1	1	1	1	1	1
Item 20	7	7	7	1	1	1	1	1	1
Item 21	7	6	7	1	0.85	1	1	0	1
Item 22	7	7	7	1	1	1	1	1	1
Item 23	7	7	7	1	1	1	1	1	1
Item 24	7	7	7	1	1	1	1	1	1
Item 25	7	7	7	1	1	1	1	1	1
Item 26	7	7	7	1	1	1	1	1	1
Item 27	7	7	7	1	1	1	1	1	1
Item 28	7	7	6	1	1	0.85	1	1	0
Item 29	7	7	7	1	1	1	1	1	1
Item 30	6	7	7	1	1	1	1	1	1
Item 31	7	7	7	1	1	1	1	1	1
Item 32	7	7	7	1	1	1	1	1	1
Item 33	7	7	7	1	1	1	1	1	1
Item 34	7	7	7	1	1	1	1	1	1
Item 35	7	7	7	1	1	1	1	1	1
Item 36	7	7	7	1	1	1	1	1	1
Item 37	7	7	7	1	1	1	1	1	1
Item 38	7	7	7	1	1	1	1	1	1

Item 39	7	7	7	1	1	1	1	1	1
	S-CVI/Ave (Relevance)	S-CVI/Ave (Clarity)	S-CVI/Ave (Simplicity)	0.99	1.00	0.99	0.95	0.97	0.95

[Table/Fig-1]: Calculation of content validation (I-CVI and S-CVI) of PDHMCCS questionnaire with 39 items, as per 7 expert responses.

CVI represents the Item Content Validity Index (I-CVI) for relevance, clarity, and simplicity, based on expert agreement. UA indicates Universal Agreement among all experts on each item for the respective domain. S-CVI/Ave is the scale-level averages, reflecting overall content validity.

Overall agreement	Kappa	Asymptotic			Asymptotic 95% CI	
		SE	z	Sig.	Lower Bound	Upper Bound
Overall agreement (Relevance)	0.404	0.035	11.6	0.002	0.336	0.473
Overall agreement (Clarity)	0.622	0.035	18.1	0.000	0.554	0.689
Overall agreement (Simplicity)	0.748	0.034	22.1	0.000	0.681	0.814

[Table/Fig-2]: Kappa statistics for relevance, clarity and simplicity among 7 experts (n =7).

This table presents the overall agreement among 7 expert raters across 39 items using Kappa statistics, where SE: Standard Error; CI: 95% Confidence Interval for the Kappa coefficient.

Step 4: Face Validity

The analysis showed good strength of agreement among experts since ten experts matched on 97% of the questionnaire items on the questionnaire. All questions passed the face validity test thus they were kept for further consideration. The % agreement of ten experts is depicted in [Table/Fig-3].

Question no.	Criteria to rate (Expert evaluation of the face validity of the instrument)	% Agreement
1	Appropriateness of grammar	100
2	The clarity and unambiguity of items	100
3	The correct spelling of words	90
4	The correct structuring of the sentences	100
5	Appropriateness of font size and space	90
6	Legible printout	90
7	Adequacy of instruction on the instrument	100
8	The structure of the instrument in terms of construction and well- thought-out format	100
9	Appropriateness of difficulty level of the instrument for the participants	100
10	Reasonableness of items in relation to the supposed purpose of the instrument	100

[Table/Fig-3]: Percentage agreement received from face validity experts.

This table presents expert agreement percentages on 10 criteria assessing the quality and presentation of the instrument. Each criterion was rated by experts for clarity, formatting, structure, and content relevance, % Agreement reflects the proportion of experts who fully agreed the item met the stated criterion.

Final Questionnaire framed: The final questionnaire framed had three domains (knowledge, skills and attitude) and 39 items, post content and face validation, as shown in [Table/Fig-4]. The final draft of PDHMCCS was copyrighted and got registered with unique registration number, L-145548/2024.

DISCUSSION

The current study demonstrated the successful development of initial validation for the PDHMCCS in terms of content and face validity. At present no standardised assessment tool exists for disaster-related competencies focused on “physiotherapist-specific” abilities but several general evaluation instruments exist for health professionals. Hsu EB et al., (2006) constructed an extensive framework describing the necessary competencies for healthcare workers in disaster training programs [16]. The questionnaire contains standard disaster response and recovery domains which nursing professionals and doctors alongside other health practitioners can apply. Although this work addresses competencies for various healthcare professionals it fails to emphasise physiotherapy-specific roles and capabilities. The Research done by Shah Ali et al., 2023, Amartya B et al., 2017 and Trivedi N et al., 2017 demonstrated the expanding function of physiotherapy in disaster recovery processes [48-50]. The works present evidence about why Physiotherapists should participate in all phases of disaster recovery from preparedness to acute intervention to extended rehabilitation services. The questionnaire presents itself as a “psychometrically validated too” to evaluate precise disaster-related competencies of Physiotherapists, unlike previous works which acknowledged their roles while lacking such an assessment framework. This assessment tool provides disaster-related competency assessment for Physiotherapists with dedicated evaluation metrics designed exclusively for their clinical work and community involvement and collaborating roles. The specialised questionnaire stands as a focused assessment tool aimed at Physiotherapists and includes organised development procedures for establishing “validity and reliability”.

Expert consensus demonstrated high agreement which yielded strong content validity indices along with inter-rater reliability to validate the questionnaire as a suitable assessment instrument for physiotherapist disaster health management competencies. The findings from the study support research that highlights growing recognition of physiotherapist involvement in disaster response [7, 13].

Physiotherapist disaster health management core competency questionnaire					
S. no.	Components				
1	I am familiar with humanitarian principles in the global framework.	1 yes	2 no		
2	I am aware of natural and man-made disasters.	1 yes	2 no		
3	I am aware of the three Disaster Phases (preparedness, response and recovery).	1 yes	2 no		
4	I am informed to contact within and outside organisation in case of a disaster.	1 yes	2 no		
5	I know sustainable medical waste disposal methods.	1 yes	2 no		
6	I have knowledge in planning guidelines, drafting and enabling strategies for DRR.	1 yes	2 no		
7	I have knowledge of physical/online/telerehabilitation.	1 yes	2 no		
8	I am aware of EWS and evacuation mechanisms.	1 yes	2 no		
9	I have understanding of emergency operations in ICS.	1 yes	2 no		
10	I can optimally utilise resources.	1 yes	2 no		
11	I am aware of effective usage and disposal of PPE.	1 yes	2 no		
12	I know procedures of decontamination, hand washing and quarantine.	1 yes	2 no		
13	I am aware of application of robotics and AI.	1 yes	2 no		
14	I can evaluate a patient.	1 strongly disagree	2 disagree	3 neutral	4 agree 5 strongly agree
15	I can do transferable skills and wheelchair operations.	1 strongly disagree	2 disagree	3 neutral	4 agree 5 strongly agree

16	I can give CPR and AED.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
17	I can give Heimlich Manoeuvre.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
18	I can use Autogenic Drainage (AD), ACBT and MV.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
19	I am proficient in suctioning and Postural Drainage (PD).	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
20	I am efficient in managing fractures and amputations.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
21	I can make use of prosthesis, orthosis, splinting and assistive devices.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
22	I can assist in reforming functional capacity.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
23	I can perform basic first aid and triage.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
24	I can manage conditions like PNI, SCI and TBI.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
25	I undergo safety skill trainings (Fire extinguisher, oxygen cylinder, portable generator usages etc.)	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
26	I undergo mock disaster drills.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
27	I have undergone certifications for BLS & ALS.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
28	I do meditate on a regular basis.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
29	I exercise regularly.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
30	I consume nutritious diet.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
31	I adapt and stay calm in challenging situations.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
32	I channelise my emotions to guide me and give the best to my profession.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
33	I efficiently deal with patient's post-traumatic stress.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
34	I can deal empathically with patient and their caregivers.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
35	I use humorous approach to maintain balance at workplace.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
36	I share respectable connections with colleagues.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
37	I can maintain equilibrium between personal and professional life.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
38	I respect patient's personal, religious, social and cultural beliefs and sensitivity.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree
39	My spirituality gives strength to deal with adverse situations.	1 strongly disagree	2 disagree	3 neutral	4 agree	5 strongly agree

[Table/Fig-4]: Final PDHMCCS questionnaire of 39 items having 3 domains (knowledge, skills and attitude). This scale assesses Physiotherapists' core competencies across disaster preparedness, response, recovery, clinical skills, psychosocial competencies, and personal well-being. Items 1-13 are rated dichotomously (Yes/No), while items 14-39 use a 5-point Likert scale from Strongly Disagree (1) to Strongly Agree (5). Responses help evaluate readiness, resilience, and professional capacity in disaster health management settings; ICS: Intensive care services; EWS: Emergency warning signs; PPE: Personal protective equipment; CPR: Cardiopulmonary resuscitation; AED: Automated external defibrillator; ACBT: Active cycle of breathing techniques; MV: Minute ventilation; PNI: Peripheral nerve injury; SCI: Spinal cord injury; TBI: Traumatic brain injury; ALS: Advance life support; BLS: Basic life support

This research showed excellent content validity through assessment of high CVR alongside I-CVI and S-CVI. Research on competency frameworks for disaster healthcare providers supports the results identified in this study, which emphasise the necessity of validated tools to assess core competencies in disaster settings [17,26]. The CVR and I-CVI values in this study exceeded the threshold commonly used in validation research, reinforcing the robustness of the developed questionnaire [40].

A notable difference between this study and earlier competency framework research, the specific focus on Physiotherapists [21,48]. The PDHMCCS provides specific competencies assessment for Physiotherapists which combines clinical skills with essential non-clinical capabilities needed for disaster management despite previous research mostly focusing on readiness competencies for general healthcare professionals. The framework's specific nature creates improved opportunities for integrating its lessons into physiotherapy teaching and practical training at educational institutions.

This investigation distinguished itself through its implementation of a modified Delphi method that allowed experts to jointly refine the questionnaire. The Delphi method serves as a competency validation approach in research by Daily E et al., (2010) and Walsh I et al., (2012) while this method used different panel sizes during separate rounds [3,27]. With seven participant experts surpassing the Lawshe (1975) recommendation of five experts this study provides stronger reliability to its findings [3,27]. Face validation during this research produced results with agreement rates exceeding 97% when compared to previous studies (Patel N & Desai S, 2020) that showed 80-90% agreement. The effectiveness of this measure in understanding and relevance achieved high acceptance among participants [47].

Some specific drawbacks exist despite the overall robustness of the report evaluation system. Additional participants should be included during future research since face validation testing employed a

suitable preliminary representative number but required additional subject to strengthen general findings. Fleiss' Kappa analysis of inter-rater reliability produced good to very good matching results for clarity and simplicity yet indicated the need for better definitions of relevant items. Additional studies need to use both a bigger expert panel consisting of diverse members alongside real-world disaster response scenario evaluations.

Limitation(s)

Despite these strengths, certain limitations exist. The sample size for face validation, while sufficient for preliminary validation, could be expanded in future studies to enhance generalisability. Additionally, while inter-rater reliability using Fleiss' Kappa demonstrated good to very good agreement for clarity and simplicity, moderate agreement for relevance suggests room for refinement in defining item importance. Future research should incorporate a larger and more diverse expert panel, along with empirical testing in real-world disaster response scenarios.

CONCLUSION(S)

The present study adds significantly to the expanding body of knowledge about disaster health management competencies for Physiotherapists. The validation of the PDHMCCS lays the groundwork for further psychometric testing and potential inclusion into disaster preparedness training programs. The findings highlight the importance of continuing to develop discipline-specific competency evaluation tools to ensure that healthcare practitioners are well-prepared for disaster response and rehabilitation.

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