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RESEARCH ARTICLE

DEVELOPMENT AND VALIDATION OF A QUESTIONNAIRE ASSESSING CHALLENGES AND COMPETENCIES OF CRISIS LEADERSHIP IN THE PUBLIC HEALTHCARE SYSTEM

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ABSTRACT

INTRODUCTION:

During the pandemic, crisis leadership is being tested in ways the world hasn't seen in generations, and leading through it has become a severe challenge for leadership in public health organisation. Therefore, this study aims to develop and validate a self-administered questionnaire (Crisis Leadership Questionnaire, CLQ) to assess the challenges and competencies faced and needed in crisis leadership.

METHODS:

The questionnaire describes the general sociodemographic data of the participant, assesses challenges in the organisation in the categories of structural (4 domain), political (3 domain), and cultural (3 domain), and also on the nine (9) competencies needed in crisis leadership. Ten (10) sociodemographic data-related questions with 90 questions (53 on the challenges and 37 on competencies) were reviewed by two experts for face validity, and exploratory factor analysis was performed, using principal axis factoring with Promax rotation, to establish the construct validity of the questionnaire. The internal consistency of the questionnaire was tested using Cronbach's a coefficient.

RESULTS:

The final CLQ contained ten (10) sociodemographic questions, thirty-three (33) items focus on challenges categorized into structural (3 domains), political (2 domains), and cultural (3 domains) aspects, and twenty-two (22) items assess five key competencies required for crisis leadership. The content validity index (CVI) value is 0.96 for the challenges construct and 1.0 for the competencies construct, respectively, while the internal consistency reliability analysis (Cronbach's alpha => 0.6) is for all the domains.

CONCLUSION:

The developed questionnaire will help better understand the challenges and competencies of crisis leadership for current and future preparedness.

KEYWORDS

COVID-19, crisis, leadership, crisis leadership, crisis leadership questionnaire

INTRODUCTION

Crisis leadership entails more than just guiding an organisation through the crisis response. It is a method by which leaders address unforeseeable circumstances that could jeopardise the public health organisational structure [1]. When a crisis arises, it can impede the growth and development opportunities that require a well-organised and methodical approach. Managing the crisis involves mitigating organisational losses and discovering inventive methods to maintain a motivated and productive workforce [2].

The crumbling of our established world views regarding the order of things poses a challenge that could either collapse or transform our organisations, entities, and systems. The outcome will ultimately depend on the effectiveness and guidance provided by our leaders [3]. Therefore, understanding the obstacles is vital because it assists leaders in gauging the potential outcomes and effects that may arise. Furthermore, it enables leaders to proactively prepare a response and empower others to implement solutions aligned with the identified priorities [4].

Leadership competency is a composite of knowledge, skills, and abilities required to perform effectively in a leadership role [5]. In the face of significant catastrophic or interconnected incidents, standard continuity, safety, and emergency response plans may prove insufficient. Instead, resolving such situations often requires exceptional leadership competencies [6]. Hence, the most notable accomplishment is to become a leader capable of effectively guiding the organisation through any situation or crisis [7].

Despite numerous disasters and the resolution of daily crises, there is a lack of documentation or records that detail the challenges faced or the necessary competencies required. Furthermore, there is a dearth of shared experiences regarding the processes involved in managing these situations. With these concerns in mind, this study aims to develop and validate a self-administered questionnaire, the Crisis Leadership Questionnaire (CLQ), to assess the challenges and competencies needed in crisis leadership. The questionnaire is designed to identify the challenges and competencies that leaders apply during crises, ultimately ensuring better management of catastrophic situations in the future.

METHODOLOGY

The developed questionnaire will be called the Crisis Leadership Questionnaire (CLQ). We included questions regarding challenges of structural, political, and cultural constructs and the competencies needed in crisis leadership. A standardised methodology was followed in developing and validating the questionnaire, including steps such as literature review, expert evaluation, pilot study, and questionnaire validation [8].

ETHICAL APPROVAL

This study was registered with the National Medical Research Register Malaysia and received its ethical approval (NMRR ID-23-00465-DVV). The study also received ethical approval from the Medical Research Ethic Committee of Universiti Malaysia Sabah (JKEtika 1/21(53)). All the participants in this survey gave their informed consent before participating.

DEVELOPMENT OF THE QUESTIONNAIRE

The questionnaire development consisted of the steps in Table 1.

DEVELOPMENT OF CONSTRUCT & ITEM GENERATION

A comprehensive literature review was done to look for the challenges and competencies of crisis leadership, although this topic has limited reference. The challenges during crisis leadership were adapted from the framework for crisis leadership during a pandemic as a guide that describes the enablers and barriers factors from the main three contexts – structural, political, and cultural [9]. Moreover, other references were used to identify challenges faced by health leadership and workforce management. These challenges are determined by deriving factors that help recognise the obstacles, facilitators, and barriers encountered during the COVID-19 pandemic. The competencies during crisis leadership are adapted from the crisis leadership competency model [10] and supported by other references.

TABLE 1: STEPS INVOLVED IN QUESTIONNAIRE DEVELOPMENT

Phases	Nature of activity	Methods	Domains	Construct	Number of constructs	Number of items	Response range	Addition or subtraction
I	Development of construct	Literature review	-	-	-	-	-	-
II	Item generation	Development of construct and item	A. Sociodemographic B. Challenges C. Competencies	 B1. structural B2. Political B3. Cultural	10 10 9	10 53 31	-	-
III	Establishment of face validity and content validity	Expert validation	A. Sociodemographic B. Challenges C. Competencies	 B1. structural B2. Political B3. Cultural	10 10 9	10 53 37	5-point Likert scale	-
IV	Cognitive interviewing	Pretesting	A. Sociodemographic B. Challenges C. Competencies	 B1. structural B2. Political B3. Cultural	10 10 9	10 53 37	5-point Likert scale	-
V	Establishment of construct validity	Item analysis and factor analysis	A. Sociodemographic B. Challenges C. Competencies	 B1. structural B2. Political B3. Cultural	10 8 5	10 33 22	5-point Likert scale	Removal of 35 items

EXPERT EVALUATION

After the literature review, the developed questionnaire was subjected to expert validation by a team of two experts (from the Department of Public Health Medicine in a university and a Hospital Director from Ministry of Health) for critical appraisals, inputs, and content validity. Based on their feedback, some items were adjusted and arranged in the questionnaire based on their suggestion and validated by the expert.

PRETESTING

The final draft of the questionnaire was pretested on eight (8) participants from a hospital and health district office background. It was done to understand if there was any ambiguity in the participant's interpretation of the developed questions. These participants completed the questionnaire and commented on its clarity, construction, and relevance. Minor changes were made to the questionnaire as per their comments.

VALIDATION OF QUESTIONNAIRE

Participant and procedure

A survey was conducted to validate the questionnaire from 1st June to 14th June 2023. A total of fifty-three (53) participants, aged 28-64, who work in hospitals and health district offices, participated in the study. The participants involved in the survey must fulfil the current inclusions and exclusion criteria such as:

- Healthcare middle managers (sister, matron, head of a technical support team, chief of medical assistant, health inspector, laboratory and radiology assistant, medical officers (team leaders), and specialist)
- Working under the Ministry of Health facilities
- Involved in administrative or management with or without clinical involvement during the COVID-19 pandemic
- In charge of the unit and team of healthcare workers
- Work a minimum of three months in pandemic occurrence in the respective department

The survey participants utilised a specially designed online platform or website (https://clc-q.com/) to answer the questionnaire. They accessed the survey through this dedicated online platform and submitted their responses electronically. The platform was created to host the questionnaire, providing participants a convenient and secure way to participate remotely.

STATISTICAL ANALYSIS

Face validity, content validity, and construct validity of the developed questionnaire were examined. Face validity and content validity were established by expert evaluation. Construct validity was established by exploratory factor analysis using principal axis factoring with Promax rotation to test the hypothesised domain structure and examine its substructure [11]. Items with a correlation coefficient >0.5 were accepted and were omitted if >0.9 [12]. Internal consistency was examined by understanding the homogeneity of the question items in each domain using Cronbach's a coefficient. A coefficient of 0.6 or higher is preferred for a questionnaire to be internally consistent [13, 14].

INTERPRETABILITY

The score resulting from the CLQ can be used as a continuous variable to analyse the mean value from each. As the questionnaire used the Likert scale to determine and measure the opinions and preferences of the participants, the range of interpreting the Likert scale mean score was given as follows: 1.00-2.33 (low), 2.34-3.67 (moderate), 3.68-5.00 (high) to represent the level of challenges and competencies needed in the organisation [15]. A low mean value indicates more challenges, while a high mean value indicates fewer challenges in the organisation.

RESULTS

DEVELOPMENT OF THE QUESTIONNAIRE

Based on the literature review, a relevant paper was identified and studied, and 31 constructs with 91 items were generated for the questionnaire. After the expert validation (from the Department of Public Health Medicine in a university and a Hospital Director from Ministry of Health), some items were adjusted, and a new item was added to the questionnaire based on their suggestion and validated by the expert accordingly. Subsequently, a total of 49 items were removed, leaving 55 items in the final version of the questionnaire.

FACE VALIDITY AND CONTENT VALIDITY

Face validity pertains to the outward appearance of a measure or procedure and its alignment with the intended construct it aims to assess. Evaluating face validity relies on the subjective judgments of individuals to determine whether the measure being employed is suitable for the specific clinical question being addressed [16]. For this questionnaire, the expert (from the Department of Public

Health Medicine in a university and a Hospital Director from Ministry of Health) evaluated it. They determined that the items were appropriate for inclusion in the instrument, and they found the language used to be easily comprehensible.

Content validity pertains to how an assessment instrument accurately captures and represents the intended construct it is created to evaluate [17]. As a result, the instrument scores can be effectively utilised for drawing relevant and suitable conclusions or decisions in line with the assessment's intended purpose [18]. For this questionnaire, the expert valued the content validity index (CVI) value for the section of challenges to be 0.98 while competencies to be 1.0.

VALIDATION

A cross-sectional survey of 53 participants was conducted to validate this tool. The general sociodemographic characteristics of participants are included in Table 2.

TABLE 2: SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Variables	N = 53	Mean±SD
Age (years)		40.6 ± 9.0
Gender		
Male	24	
Female	29	
Ethnic		
Malay	11	
Chinese	6	
Indian	6	
Sabah Native	30	
Education level		
STPM	1	
Diploma	19	
Degree	30	
Master/PhD	3	
Marital status		
Single	6	
Married	45	
Divorce	1	
widow	1	
Organisational position		
Sister	11	
Matron	4	
Technical support team	6	
Chief of medical assistant	6	
Chief of laboratory assistant	2	
Chief of radiology officer	2	
Medical officers	20	
Specialist	2	
Years of working as a healthcare worker		
Less than 5 years	4	
5-10 years	17	
11-15 years	7	
16-20 years	3	
21-25 years	9	
More than 25 years	13	

Comorbidity	
No	41
Yes	12
Diabetes mellitus	2
Hypertension	7
Dyslipidemia	4
CVD	-
Others	3
Attendance to leadership course	
No	37
Yes	16
Number of subordinates	
10 and below	24
11-20	7
21-30	9
31-40	3
41-50	4
>50	6

Factor analysis was employed to establish construct validity. The completed questionnaires underwent item analysis to ascertain the structure of the tool. A correlation matrix was created to assess the degree of correlation. Sampling adequacy was confirmed through a Kaiser-Meyer-Olkin value above 0.6 for all domains, while Bartlett's test concluded that the sphericity hypothesis could be rejected ($p < 0.001$). Subsequently, factor analysis was conducted using principal axis factoring and Promax rotation to examine the domain structure. Following this analysis, a total of 28 constructs – sociodemographic [14], challenges [9], and competencies [5] were identified. The independent Cronbach's a for all the domains were >0.6, respectively, and values indicate good internal consistency. The exploratory factor analysis (EFA) results for the challenge domain are summarised in Table 3 – 5, while Table 6 explains the competencies domain.

TABLE 3: CHALLENGES IN STRUCTURAL (N = 53)

Item	KMO value	Factor			Cronbach's a
		1	2	3	
SQ1	0.761	0.821			0.760
SQ2		0.795			
SQ3		0.787			
SQ7		0.554			
SQ14			0.814		0.887
SQ15			0.805		
SQ17			0.856		
SQ18			0.891		

SQ6				0.720	0.811
SQ10				0.728	
SQ20				0.887	
SQ22				0.613	
SQ25				0.747	

TABLE 4: CHALLENGES IN POLITICAL (N = 53)

Item	KMO value	Factor		Cronbach's a
		1	2	
PQ1	0.644	0.620		0.783
PQ2		0.499		
PQ3		0.836		
PQ4		0.674		
PQ6		0.632		
PQ8			0.612	0.616
PQ9			0.480	
PQ10			0.514	
PQ11			0.682	

TABLE 5: CHALLENGES IN CULTURAL (N = 53)

Item	KMO value	Factor			Cronbach's a
		1	2	3	
CQ1	0.644	0.814			0.85
CQ2		0.787			
CQ3		0.784			
CQ4		0.683			
CQ5			0.585		0.832
CQ6			0.765		
CQ7			0.797		
CQ8			0.870		
CQ9				0.623	0.6

CQ10				0.471	
CQ11				0.721	

TABLE 6: COMPETENCIES OF CRISIS LEADERSHIP (N = 53)

Item	KMO value	Factor					Cronbach's a
		1	2	3	4	5	
CoQ1	0.749	0.508					0.70
CoQ2		0.754					
CoQ3		0.419					
CoQ4			0.671				0.863
CoQ5			0.766				
CoQ6			0.475				
CoQ7			0.900				
CoQ8			0.611				
CoQ9				0.453			0.831
CoQ10				0.952			
CoQ11				0.714			
CoQ12				0.402			
CoQ13				0.406			
CoQ14					0.836		0.892
CoQ15					0.902		
CoQ16					0.967		
CoQ17					0.75		
CoQ18						0.996	0.878
CoQ19						0.534	
CoQ20						0.680	
CoQ21						0.858	
CoQ22						0.625	

DISCUSSION

To our knowledge, the CLQ is the first validated, self-administered scoring tool designed to assess the challenges and competencies of crisis leadership in the public healthcare system. The public healthcare system faces numerous daily challenges worldwide, especially in a crisis or pandemic. Thus, understanding the challenges and competencies applied during a crisis is essential for enhancing crisis preparedness, improving leadership effectiveness, and ensuring the long-term resilience of organisations in an increasingly complex and interconnected world [19, 20].

The CLQ plays a unique role as it could be used pre or post-crisis incidence as a tool to evaluate the situation and collect evidence based on the experience of the healthcare workers to document their feedback that can be used for the improvement and betterment of the healthcare organisation. As other studies generally used a qualitative approach to understand the challenges faced by healthcare workers [21, 22], the items derived in our questionnaire are based on the vast literature review and references that focus and describe the important or vital aspect of challenges faced by the workers. Therefore, with the findings from our study, the organisation can look back on its capacity and work forward on the specific area for improvement.

Healthcare workers' challenges and competencies are generally discussed as a compilation of reviews in general situations [23, 24]. Our study selected the final construct and subconstruct based on the local population's opinions and feedback on the issues discussed. Most of the literature review references describe the topic based on the views from many other situations and locations, while the challenges and issues in every healthcare organisation are different. In our study, the challenges and the competencies tested can be applied to healthcare organisations from developing countries, which may have different hurdles than developed countries [25].

In this questionnaire, the focus is given to the main three domains, which are sociodemographic, challenges, and the competencies of crisis leadership. Understanding sociodemographic information is fundamental as it ensures that healthcare and public policies are equitable, effective, and responsive to the diverse needs and characteristics of the population [26]. In the sociodemographic section, there are two important factors assessed which are related to individual factors – gender, ethnicity, marital status, education level, years of working, comorbidity, attendance to a leadership course, and organisational factors such as organisational position, type of facilities and the number of subordinates. Both factors are important in determining and influencing an organisation's leadership role [27].

The challenges domain is divided into three constructs: structural, political, and cultural, and each construct has its sub-construct. With eight sub-constructs, the challenges part of the questionnaire has 33 items. The structural construct assesses the structural challenges in the organisation, defined as the framework of the relations on jobs, systems, operating processes, people, and groups trying to achieve the goals [28]. Three sub-constructs assessed are the organisation's human resources, bureaucracy, and infrastructure.

Political construct assesses the political influence that manages government institutions and resources to operationalise strategy decisions, mobilise action outside the government, and inform and inspire people through mass communication [23]. Two sub-constructs assessed are budget allocation and adaptivity to changes. Lastly, the cultural construct assesses the "organisational culture" that refers to the organisation's long-standing beliefs and values, the staff's views, and the anticipated value of their job, which will affect their attitudes and behaviour [29, 30]. Three sub-constructs evaluated are employee growth, environment orientation, and emphasising responsibility.

Competencies are underlying characteristics of people that indicate a way of behaving or thinking that is generalisable across situations and enduring over time [31]. These include observable knowledge, skills, and abilities that translate to behavior and, as a result, predict job performance [10]. Crisis leadership competencies play a vital role in ensuring the optimal performance of leaders during public health emergencies. For the competencies, the final version has 22 items under five essential competencies – team leadership, credibility, integrative thinking, emotional effectiveness, courage and perseverance to be focus as important value to be implemented during the crisis. The final developed questionnaire will take 15 minutes to administer by the participant.

Nevertheless, it is essential to acknowledge that in this research, the questions and items developed are influenced by the challenges in regional context. Since our study was done in Sabah, the responses are affected by the experience of the local participants, who may have faced more complex and arduous challenges than in West Malaysia. However, the questions in the questionnaire are still applicable and relevant to be tested and understand the challenges and competencies in other organisations. Another limitation is that despite our effort to balance understandability, clarity, simplicity, and response bias, some questions are still lengthy and could affect the participant's attention span [32].

CONCLUSION

We have developed and validated a self-administered questionnaire that provides a comprehensive understanding of sociodemographics, challenges, and competencies of crisis leadership in a healthcare organization. As a novel tool, the CLQ contributes to the leadership field by offering insights into the difficulties of managing crises and providing valuable feedback from healthcare workers for urgent and future improvement in crisis management within healthcare organizations.

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CONFLICTS OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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