Original Article

Health vulnerability: evidence of validity of an item bank

Vulnerabilidade em saúde: evidências de validade de um banco de itens

Vulnerabilidad en salud: evidencias de validez de un banco de ítems

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Abstract

Objective: To analyze the evidence of content validity and response process of a health vulnerability item bank.

Methods: Psychometric study with support of Pasquali's theoretical pole in which 62 specialists with different sociodemographic and academic characteristics were selected and 15 of them responded to the content validity questionnaire. After adjustments, the bank moved to the response process validity phase and was evaluated by 12 health service users. A content validity coefficient was used to evaluate the items and the bank, which had the reliability assessed by the binomial test, considering a percentage of 80% and p-value >0.05.

Results: The bank presented good evidence of content validity by experts. The coefficients were 0.87 for the subject element, 0.86 for the social element and 0.865 for the general element. The target audience made suggestions in the response process validity phase to better understand the items (total coefficient: 0.89), which were considered clear, accurate and understandable.

Conclusion: The final version of the item bank has 535 items, 238 for the subject and 297 for the social element. It presents evidence of validity of content and response process and is suitable for testing the validity of internal structure.

Resumo

Objetivo: Analisar as evidências de validade de conteúdo e processo de resposta de um banco de itens sobre vulnerabilidade em saúde.

Métodos: Estudo psicométrico, subsidiado pelo polo teórico de Pasquali. Foram selecionados 62 especialistas com características sociodemográficas e acadêmicas distintas. Desses, 15 responderam ao questionário de validade de conteúdo. Após os ajustes, o banco passou para fase de validade de processo de resposta e foi avaliado por 12 usuários dos serviços de saúde. Utilizou-se coeficiente de validade de conteúdo para avaliação dos itens e do banco, cuja confiabilidade foi verificada pelo teste binomial, considerando percentual de 80% e p-valor >0,05.

Resultados: O banco apresentou boa evidência de validade de conteúdo pelos especialistas, cujos coeficientes foram 0,87 para o elemento sujeito, 0,86 para o elemento social e 0,865 para o geral. O público-alvo realizou sugestões na fase de validade de processo de resposta para melhor compreensão dos itens (coeficiente total: 0,89), sendo considerado, claro, preciso e compreensível.

Conclusão: A versão final do banco de itens possui 535 itens, sendo 238 para o sujeito e 297 para o social. Apresenta indícios de evidência de validade de conteúdo e processo de resposta e está apto para testagem de validade de estrutura interna.

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Conflicts of interest: none to declare.

Resumen

Objetivo: Analizar las evidencias de validez de contenido y proceso de respuesta de un banco de ítems sobre vulnerabilidad en salud.

Métodos: Estudio psicométrico, fundamentado por el polo teórico de Pasquali. Se seleccionaron 62 especialistas con características sociodemográficas y académicas diferentes. Entre ellos, 15 respondieron al cuestionario de validez de contenido. Después de las adaptaciones, el banco pasó a la fase de validez del proceso de respuesta y fue evaluado por 12 usuarios de los servicios de salud. Se utilizó el coeficiente de validez de contenido para evaluar los ítems y el banco, cuya fiabilidad ser verificó mediante la prueba binominal, que consideró un porcentaje de 80 y p-valor >0,05.

Resultados: El banco presentó buena evidencia de validez de contenido por los especialistas, cuyos coeficientes fueron 0,87 en el elemento sujeto, 0,86 en el elemento social y 0,865 en el general. El público destinatario realizó sugerencias en la fase de validez del proceso de respuesta para una mejor comprensión de los ítems (coeficiente total: 0,89) y fue considerado claro, preciso y comprensible.

Conclusión: La versión final del banco de ítems contiene 535 ítems, de los cuales 238 son para el sujeto y 297 para el social. Presenta indicios de evidencia de validez de contenido y proceso de respuesta y está apto para una prueba de validez de estructura interna.

Introduction

Health vulnerability is included in public health discussions with a view to health promotion. As it emphasizes the relational condition of human life, hence its complexity, this is an analytical category that requires in-depth analysis.[1,2] In view of this, recognizing a condition of health vulnerability can produce subsidies to think about the form of conducting strategies to change a precarious reality of human life and take communities to a higher level of health promotion.

The concept brings an approach linked to the relationship between subjects and social aspects that end up generating susceptibilities and precariousness to some situation in the health context, but also rescuing the possibilities of recognition, coping and responding to a condition of vulnerability in health.[1-4] Different conceptual frameworks were constructed in different contexts, including that of Florêncio and Moreira,[1] which presents different nuances of vulnerability in health organized in a "social subject" conceptual model that is organized into definitions, coordinating two essential elements and their analytical components: 1) subject (literacy, behavior, interpersonal relationships, psycho-emotional status, physical status) and; 2) social (socioeconomic status, demographic identity, culture, family context, social networks and supports, gender, violence, social control, ecosystem, access to fundamental rights, programmatic status and State).[1]

Despite the effort to construct a theoretical discussion, it is difficult to make practical aspects of the work of professionals in the health field viable, partly given the misunderstanding about the equivalence between health vulnerability and risk, and also by the subjective character of health vulnerability, since this is a relational and complex condition.[1,2]

An alternative to this articulation is the construction of validated instruments that guide health professionals in the identification and assessment of vulnerability to minimize part of the difficulties in the operationalization of care practices supported by the concept. There have been several constructions in this sense, with evident discussions about the clarification of the concept, whether in relation to theoretical, methodological aspects or in an attempt to identify people in conditions of health vulnerability through measuring instruments.[1-3]

The framework of the existing instruments includes individual, social and programmatic dimensions;[4] human person, co-presences and care[2] or dimensions referring to social determinants in health,[3] for example. The item bank, the focus of this study proposal, is part of an approach to the conceptual model proposed by Florêncio and Moreira,[1] bringing the social subject's perspective. For the authors,[1] vulnerability in health is a condition of human life produced in the articulation of components of the aforementioned perspective, giving possibilities for precariousness at times, and transformation at other times for the power of making and achieving health promotion.

A review of synthetic health, social or environmental vulnerability indices was identified when performing a literature search.[3] After its publication, other instruments were created, such as: programmatic vulnerability item bank,[5] vulnerability

instruments to physical inactivity,[6] health vulnerability assessment questionnaire for people with heart failure.[7] None of them covers vulnerability in health in general, though. Some are for specific areas while others are for specific dimensions of the social subject model.

Building an instrument with items that corroborate the conceptual model of the social subject is a challenge due to theoretical abstraction, even though it can be done, considering there are scientific resources, such as psychometrics. Validity is a characteristic that must be especially explored, because when one proposes to construct items that portray vulnerability in health, it must be asked if they really talk about health vulnerability and not fragility, for example.

Therefore, the aim of the study is to analyze the evidence of validity of content and response process of a health vulnerability bank item.

Methods

This is a psychometric study developed with the support of Pasquali's theoretical pole[8] and content validity of the item bank for evaluating health vulnerability. These studies assess the reliability and validity of a given instrument regarding a construct that it intends to measure.[9]

The construction of the items arose from stages prior to this study, approaching the health vulnerability model, where constitutive and operational definitions were developed.[1] Thus, it was possible to develop the items and their response options. This construction was made from sixteen meetings between three authors of this study, lasting from 53 minutes to three hours. The first took place on 3 February and the last on 7 May, 2021.

From these meetings, 547 items were initially prepared and distributed between the two essential elements of Florêncio and Moreira's conceptual model[1] for a posterior evaluation. Each item has its specific response option as follows: two options (one corresponds to no at a lower level of health vulnerability; and two to yes, at a higher level of health vulnerability) or seven options (one corresponds to the state of lower health vulnerability; option six is the situation with the highest health vulnerability possible; and seven corresponds to "not applicable", and should be used when the participant cannot indicate any answer).

A search was performed on the lattes platform and experts were selected based on the parameters of Guimarães et al.[10] They were classified as Junior, Master or Senior expert. No minimum proportions were adopted for each classification. The higher the score the better the level, and the minimum score to be considered an expert was five points. The parameters comprised four years of clinical experience, teaching experience, published article in the area, participation in research groups, doctorate/master's degree in the area of study and residency in healthcare. It was not mandatory that experts presented all the parameters, but they should have the minimum score necessary to be considered an expert in the area. All parameters were in the area of health vulnerability or construction and evidence of validity of health technologies.

After identifying the experts, they were sent an invitation email containing a link to the form built on Google Forms with seven sections including the following: 1. Welcome, invitation letter and space for suggestions from other experts; 2. Informed Consent Form (IC); 3. Instruction guide for filling out the form containing the item evaluation criteria; 4. Identification of experts; 5. Health vulnerability conceptual model with its concepts and sub-concepts; 6. Indication to the next section (evaluation of items) and; 7. Evaluation of the bank with 547 items. Of the 62 eligible specialists, fifteen returned.

The items were scored using categories based on a five-point Likert scale: 1) The item is very little indicative of health vulnerability; 2) The item is poorly indicative of health vulnerability; 3) The item is considerably indicative of health vulnerability; 4) The item is very indicative of health vulnerability and; 5) The item is extremely indicative of health vulnerability. For this purpose, scores of 4 or 5 were considered high; 3 average; and 1 or 2 were low. After evaluation with experts, 12 items were excluded, and 535 were presented in the next stage.

The inclusion criteria for the response process validity phase were: participants aged over 18 years, residents of Fortaleza, users of Primary Health Care Units. There were no exclusions, as the minimum educational level of participants was primary school and none had visual or hearing limitations that prevented the performance of the interview. These were selected via virtual snowball sampling.[11] This type of subject selection is used because the sample is self-generated, and even if the number of people to be surveyed was defined mathematically, not all elements of the target population have the same possibility of being reached.[11] Especially during the Covid-19 pandemic, which required the use of digital technologies to perform the data collection process in scientific research.

The sample was made up of 12 people and the initial approach was through prior contact between a researcher of the study and the users treated at the health service, mediated by the WhatsApp mobile application. After accepting to participate in the study, the IC was sent to them and a time was scheduled to carry out the interview. The number of people was determined based on considerations about Pasquali's theoretical pole.[8] The items were presented to a reduced number of subjects, who had characteristics of the target population. At this stage, the objective was to assess the need for changes related to the understanding by lay people.

The interview was carried out via the Google Meet platform, which was the most used within the COVID-19 pandemic context and did not require prior registration by participants. Each interview lasted around 50 minutes and questions about sociodemographic aspects such as age, sex, income, education, color/race, previous illnesses and the most used health service were asked.

Regarding the presentation of the items, 535 and their response options were exposed. The criteria used in their evaluation were: clarity of language (observe if all the words are known), adequacy (situations that happen or could happen) and understanding (explain the item to the interviewer).[12] In each question, participants gave their opinions and were given clarifications. The interviews were recorded after consent.

A one to five Likert scale was used in the evaluation of the item by the participant: 1) question very little appropriate/clear/understandable; 2) question not very appropriate/clear/understandable; 3) considerably appropriate/clear/understandable question; 4) very appropriate/clear/understandable question; and 5) extremely appropriate/clear/understandable question. Data collection from the entire content validity process and response process took place from May 2021 to November 2022.

Data were organized in a Microsoft Excel® spreadsheet. The socio-professional variables for experts were: name, age, sex, state, basic profession, scientific production, experience in care, teaching and management. The criteria for evaluating the items were clarity of language, practical relevance, and theoretical relevance for the experts,[13] and adequacy, clarity and understanding for the target audience.[12]

Data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS®), version 25. The content validity coefficient (CVC) [13] was used, and items with scores equal to or greater than 0.80 were considered, both in terms of content validity and response process validity. A binomial test was used to estimate statistical reliability of the CVC with a significance level of $p>0.05$. This test was used due to the small sample size, and because there were responses to only two items of the scale. The results were grouped according to the subject and social elements and the analytical components (concepts) to facilitate the presentation, and simple arithmetic mean values were calculated.

This study complied with resolution 466/2012 of the National Health Council and was approved by the Human Research Ethics Committee of the Universidade Estadual do Ceará (UECE) under number 4.393.432 (Certificate of Presentation of Ethical Appreciation: 78741217.6.0000.5534).

Results

The bank was built and initially evaluated by experts and then by the target audience, whose characteristics are presented in table 1.

Table 1. Sociodemographic characterization of experts and target audience

Variables	n(%)
Experts	
Sex	
Female	12(80.0)
Male	3(20.0)
State	
Bahia	1(6.7)
Ceará	9(60.0)
Paraíba	1(6.7)
Paraná	2(13.3)
Rio de Janeiro	1(6.7)
Rio Grande do Norte	1(6.7)
Degree area	
Nursing	9(60.0)
Speech therapy	1(6.7)
Nutrition	1(6.7)
Physical Education Professional	2(13.3)
Social Service	2(13.3)
Higher degree	
Master	10(66.7)
Doctorate	4(26.7)
Post-doctoral	1(6.7)
Clinical practice	
Yes	12(80.0)
No	3(20.0)
Management practice	
Yes	8(53.3)
No	7(46.7)
Teaching practice	
Yes	13(86.7)
No	2(13.3)
Target audience	
Sex	
Female	7(58.3)
Male	5(41.7)
Color/race	
White	6(50.0)
Black	3(25.0)
Brown/mixed race	3(25.0)
Education	
Primary school	1(8.3)
Secondary school	5(41.7)
Complete higher education	4(33.3)
Postgraduate studies	2(16.7)
Previous illness	
Yes	7(58.3)
No	5(41.7)
Most used service	
Clinic	1(8.3)
Hospital	2(16.7)
Primary Care Unit	6(50.0)
Emergency care unit	3(25.0)

The analysis of sociodemographic characteristics showed a diverse profile with experts of working age (36.1 years; ± 11.7), mostly women, a large part from Ceará, in the Nursing category and holders of a master's degree. In relation to professional practice, the majority indicated clinical and teaching experience and just over half had experience in management. The fact that 100% of experts had research/publications on vulnerability or methodological studies stands out. After identifying the profile of experts, came the stage of presenting the validity coefficients to identify if the items dealt with the essential elements and analytical components (concepts and sub-concepts), as shown in table 2. After calculating the CVC for each item and element, the bank of items obtained a total coefficient of 0.87, indicating clear content in relation to language, understandable and with good practical relevance. Twelve items were excluded. In sequence, came the items for the validity of the response process, and the target audience evaluated the items and their respective response options for criteria of clarity, adequacy and understanding. At this stage, people had an average age of 41 years (± 17) and income of R$ 2000.00 (± 850.00). Just over half were women, half declared themselves to be white and the other half were black or brown/mixed race; almost half completed high school and had some previous illness, and the primary unit was the most used health service. The validity of the item bank regarding the response process was adequate; the total CVC was 0.89, indicating that the items are attributes of health vulnerability (Table 2).

Suggestions were made in the content validity and response process phases, some of which were incorporated and others were not. Some items were excluded to meet the assumptions of the conceptual model. Thus, the final version has 535 items; 238 for the subject and 297 for the social. Each item has its specific answer option, with two options or seven options corresponding to the lowest or highest status of health vulnerability depending on the question. After the evaluations, no options were modified.

Discussion

The 'social subject' conceptual model constructed as an alternative to reflect health vulnerability was used to support the development of the item bank presented in this article. From this perspective, when observing the content validity coefficients and response process of the items and the bank of items, there is evidence that they are a representative part of health vulnerability.

Table 2. Content validity coefficient/response process and binomial test of the essential element and concepts (social subject model)

Item	Mean CVC† (clarity, pertinence, relevance) experts	p-value binomial test	Mean CVC† (clarity, adequacy, understanding) target audience	p-value binomial test
Essential element – subject (238 items)	**0.87**	-	**0.88**	-
Functional literacy (38 items)	0.85	0.09	0.85	0.21
Behavior (56 items)	0.86	0.42	0.92	0.46
Interpersonal relationships (19 items)	0.87	0.48	0.90	0.35
Psycho-emotional status (67 items)	0.88	0.67	0.85	0.66
Physical status (58 items)	0.90	0.49	0.87	0.07
Essential element – social (309 items)	**0.86**	-	**0.90**	-
Socioeconomic status (59 items)	0.82	0.31	0.90	0.33
Demographic identity (9 items)	0.80	0.30	0.91	0.43
Culture (5 items)	0.80	0.30	0.89	0.31
Family context (24 items)	0.96	0.52	0.91	0.46
Social networks and supports (14 items)	0.83	0.32	0.86	0.48
Gender (12 items)	0.82	0.45	0.91	0.37
Violence (28 items)	0.86	0.53	0.87	0.56
Social control (6 items)	0.88	0.67	0.92	0.68
Ecosystem (16 items)	0.93	0.49	0.85	0.49
Access to fundamental rights (32 items)	0.81	0.47	0.91	0.23
Programmatic status (88 items)	0.91	0.50	0.95	0.56
State (16 items)	0.89	0.48	0.89	0.39

†CVC: Content Validity Coefficient

Vulnerability in health has a close relationship with health promotion, as it focuses on thinking about the condition and participation of service users, the community, and different sectors of society to combat social inequalities. Thus, the item bank presented here can portray the theoretical framework, inequalities and precariousness experienced in people's daily lives that are influenced by one, two or all aspects of the dimensions of the conceptual model, making a situational and contextual diagnosis.

With regard to items pertinent to the 'subject', there is a greater concentration of items in aspects related to behavior, psycho-emotional and physical status. This is also evident in the 'social' question, where socioeconomic status, access to rights and programmatic status contribute to a greater number of questions. This question is justified by the fact that the conceptual model is based on a review that brought greater emphasis on articles focused on these aspects, which are organized in another framework that ratifies the individual, social and programmatic dimensions.[2,4]

When analyzing the content validity in other studies on vulnerability, the approximation of items and values in the assessment is clear, which can be explained by the adoption of the same theoretical framework.[5-7,14] Another finding was that some instruments have worked with individual dimensions and other types of validity through comparison with other instruments already created,[15,16] or using validations through factor analysis.[17]

In a review of synthetic indices,[3] those selected could be classified into four thematic categories depending on their prevailing approach: synthetic vulnerability indices from the perspective of social determinants of health; socio-environmental and climatic conditions; of the family and the course of life; and of a specific territory and geographic spaces. The studies analyzed both primary data, collected through field research, and secondary data from databases such as IBGE (Brazilian Institute of Geography and Statistics), SIM (Mortality Information System), Sinasc (Live Births Information System) and city halls. However, the majority used secondary data[3] and had different validations than those found in this article.

Another point that deserves attention is that the items were constructed from a perspective in which their response options are in levels, making it possible to identify vulnerabilities and consequently, understand health needs. This fact refers to the discussion of equity, since it is necessary to recognize which aspects will be a priority focus for health pro-

motion strategies, without excluding others. Equity is examined as the global guiding principle for reducing vulnerability. It is one of the principles of universal health systems, such as the Unified Health System (SUS) in Brazil, and represents a major challenge to be discussed and faced.[18]

Equitable policies constitute a means to achieve equality. However, this formulation is based on recognizing the existence of vulnerabilities in the micro and macro sphere. Thus, based on the construction and evaluation of the item bank, several relevant issues can be articulated.

This scenario reiterates the researchers' need to build measurement instruments for health vulnerability with a view to minimizing the scientific gap and bringing the theoretical field closer to care and health promotion practices. This is the first health vulnerability item bank that we are aware of in which the social subject conceptual model was used in full without specifying a dimension or area of study. The study operationalized the definitions into items and validated them in relation to the content and response process, encompassing questions for the subject and social element, its concepts and sub-concepts. Note that evaluating validity is also a type of empirical test for the model,[1] ratifying its components.

Furthermore, the instrument allows a more accurate look at the essential elements of the subject, who is defined as "human life constituted from intersubjective relationships, where there is space for the manifestation of freedom in the tension between knowledge and power and for possibilities of recreating oneself"; and the social, interpreted as the "appearance scene that presupposes the different ways in which the subject relates to other lives or institutions in the health field; it is the space to express oneself, to recognize oneself and to be recognized by and with the other".[1]

Even though the elements are defined and presented separately, they are intrinsically articulated without much limits to their differentiation. This issue was experienced by researchers when allocating many items within the instrument, since there were doubts as to which analytical component or element would be best arranged. The experts also asked questions about these choices, when lower CVC scores were identified in case of disagreement about inclusion, especially with regard to social issues. Nonetheless, the items were created and allocated as best suited to the conceptual model.

Given the multiple and dynamic nature of human beings, the theoretical discussion about health vulnerability is still in progress. Therefore, more than consensus, it is necessary to maintain the debate, encompassing epistemological, methodological, ethical and political approximations and disagreements.[19]

This discussion brings to light some limitations when building and validating instruments that concern the subjective issues of the construct, since health vulnerability is a condition of human life permeated by these subjectivities. It is noteworthy that no object of scientific study can cover all aspects encompassing human life. Therefore, this is an approximation to the context of health vulnerability that can provide clues so that other studies can be considered in other aspects. This is not a closed database, but an initial discussion of what can be identified and evaluated for a better understanding of vulnerability in health.

Conclusion

The instrument presents evidence of content validity by experts and response process by the target audience and can have its internal structure assessed, followed by the construction of the health vulnerability scale. Furthermore, although the instrument is intended for users of the Unified Health System (SUS) or other systems, there must be an intermediary in the conduct of the interview by researchers, professionals who work in direct care in the SUS (or other systems) or in management to facilitate the process of understanding and filling out. It is expected that after this study, there will be continued validity of the instrument with the aim of creating a measurement scale. Thus, researchers, managers and health professionals can use the instrument in research and routinely in services with a view to identifying situations of vulnerability at

any level. With this, policies and strategies of educational, social or clinical actions can be planned, organized and performed within the scope of health promotion aiming to meet the real health needs of communities.

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Collaborations

Florencio RS contributed to the design of the project, analysis and interpretation of data, writing of the article, relevant critical review of the intellectual content and approval of the final version to be published. Cestari VRF, Azevedo SGV, Borges JWP, Santiago JCS, Pessoa VLMP and Moreira TMM contributed to writing the article or relevant critical review of the intellectual content and final approval of the version to be published.

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