Content Validity of Knowledge Questionnaire on HPV Infections, HPV Vaccination and Cervical Cancer

Sudha Rani S[1], Raja A[2], Balasubramanian N[3]

[1]Professor cum Vice-Principal, Ambika College of Nursing, Mohali, [2]Principal cum Professor, Unity College of Nursing, Mangalore, [3]Principal cum Professor, Ambika College of Nursing, Mohali

Abstract

Introduction: The significant stage in research is the construction of the tool. Validity is the initial step in standardization of the tool. Content validity is the subjective agreement of professional experts that the content of the scale logically appears to accurately reflect what it is intended to measure. This article elaborates the significance and sequential steps of content validity.

Materials and Methods: The knowledge questionnaire on HPV infections, HPV vaccinations and cervical cancers is a newly developed tool by the authors. It is a part of larger study. Eight experts have been selected purposively after their consent. The experts were in the field of Nursing and OBG medicine. Based on the experts opinion content value index (CVI) and content validity ratio (CVR) was computed.

Results: The computed value of content validity index is found to be anexcellent in both item interval and scale interval. Content value ratio of the computed value is one. Hence, all the items has not been changed and kept as it is for further process. This findings show that this knowledge questionnaire shows acceptable validity.

Conclusion: This structured knowledge questionnaire isa significant tool in medical, nursing and health sciences. It is mandatory to compute reliability for the further use. In this article, content validity procedure was explained in detail which will be useful for the researchers in future.

***Key words**: content validity, content validity ratio, content validity index, HPV infections, HPV vaccination, Cervical Cancer*

Introduction

Content validity is defined as "the degree to which elements of an assessment instrument are relevant to a representative of the targeted construct for a particular assessment purpose"[1].Content validity is known as "logical or rational validity is the estimate of how much a measure represents every single element of a construct"[2]. This tool is developed to assess the knowledge on HPV infections, HPV vaccination and cervical cancer among rural women of south India.Worldwide, the fifth most common cancer in humans is cervical cancer and it is the second most common cancer in women and the most common cancer cause of death in the developing countries.TheHuman Papilloma Virus (HPV) infection transmits through sexually is the most important risk factor for cervical intraepithelial neoplasia and invasive cervical cancer[3]. It is estimated that around 80% of the sexually active women get genital HPV in 50 years of age. Thus, the start of a vaccine against HPV has motivated as well as question[4].It is clear that HPV is a main cause of cervical cancer[5]. So, HPV vaccination is the only mode to prevent it[6]. Societal, religious and ethical issues linked with the vaccination of adolescent girls in India in concert with lack of awareness about HPV and HPV vaccines, no successful HPV immunization program has been employed in India[7]. Hence, authors developed a tool as a part of larger study to assess knowledge and tested before and after implementation of a module to create awareness.

Materials and Methods

Ethical concern: This study obtained ethical approval from the Himalayan University, Itanagar, Arunachal Pradesh, India. Research Ethical committee

Development of the knowledge questionnaire: Extensive literature was initially done to develop a tool. A literature review is defined as "a descriptive, analytic summary of the existing material relating to a particular topic or area of study"[8]. Review literature helps in making decisions about the suitability of material to be considered[9]. PubMed, CINAHL, books, reports, articles, periodicals, published and unpublished research studies and mass education media were reviewed for literature. After search of existing tool, it is observed that no tool has been found based on the objectives of the study. Hence, authors developed the own tool and validated. To assess the knowledge, MCQ(Multiple Choice Questions) questionnaire isconsidered as anefficient tool[10], so it is developed. The knowledge questionnaire developed by authors was divided into three areas that are: i) knowledge on HPV ii) knowledge on HPV vaccination iii) knowledge on cervical cancer. The content covered in these areas is meaning, causes and risk factors, clinical features, diagnostic evaluation ofHPV infections and cervical cancer as well as HPV vaccination. The items constructed in the knowledge questionnaire are based on review literature. Finally, the draft knowledge questionnaire before content validity contains 38number of items. All items prepared are in multiple choice questions, with a stem and four distracters.

Content validity procedure

The following steps are followed in content validity:

- Ø Preparation of content validity evaluation form
- Ø Selection of content validity experts
- Ø Data sheet and scoring
- Ø Calculating content validity index
- Ø Calculating content validity ratio

Preparation of content validity evaluation form: The initial process in content validity is preparation of content evaluation form, which is to be submitted to the subject experts along with newly developed tool. It should be prepared in such a way that the experts will go through the content and find out the relevancy, clarity, simplicity andambiguity.The criteria for measuring content validity includes that the content in the item is not relevant, needs modification, needs minor modification and relevant. The authors adopted Yaghmaie F[11] criteria for measuring content validity and based on that evaluation form was developed. The scoring ranges from 1 to 4. Experts wereasked to rate the items in the content validity evaluation form.

Item no	Relevancy				Clarity				Simplicity				Ambiguity			
	Not relevant	Needs modification	Needs Minor modification	Relevant	Not relevant	Needs modification	Needs Minor modification	Relevant	Not relevant	Needs modification	Needs Minor modification	Relevant	Not relevant	Needs modification	Needs Minor modification	Relevant

Selection of Content validityexperts: Experts were selected on the basis of their qualifications, job title, experience, knowledge and availability to complete the task within the specified time frame. Thus, authors had selected eight experts who areexpertise in the particular topic with minimum qualification of PhD in nursing and M.D in Ob. GObstetrics &Gynecologyspecialty. Four experts were from the field of Nursing and three were ObG specialist and one bio-statistician was selected. The authors contacted experts through mobile and after consent the tool has been submitted to the experts for content validity with study objectives, synopsis, a requesting letter for content validity and content validity certificate. The experts were requested to go through the

knowledge questionnaire and give their validity based on relevancy, clarity, simplicity and ambiguity in the content evaluation form of items. The tool has been collected and analyzed for validity after receiving from all experts. Five experts gave their suggestions face-to-face and three non face-to-face approaches.

Data sheet and scoring: The rating given by the experts has been noted in the data sheet. The item number and expert number are marked in the coding sheet. The evaluation form submitted to the experts is four points rating scale which has scoring of not relevant (1), needs modification (2), needs minor changes (3) and relevant (4). Further, the data was computed for content validity index.

Calculating content validity index: Content validity index is used to find out representativeness, comprehension, ambiguity and clarity. Two types of content validity index (CVI) are calculated i.e., I-CVI and S-CVI. I-CVI is item level content validity index. It is the proportion of content experts giving items a relevance rating 3 or 4[12]. The formula used to compute I-CVI is agreed item/number of experts. S-CVI is scale for content validity index. It is the average of I-CVI scores for all items on the scale.There are two methods for estimating S-CVI, inwhich the average of the I-CVI scores forall items on the scale (S-CVI/Ave) andthe proportion of items on the scale thatachieve relevance scale of 3 or 4 by allexperts (S-CVI/UA). The experts rate the items 1 to 4, as given in the following rating.

Determination of content validity index.

Item no	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E A	I-CVI	UA
1 to 26	1	1	1	1	1	1	1	1	8	1	1
27	1	1	0	1	0	1	1	0	5	0.62	0
28 to 31	1	1	1	1	1	1	1	1	8	1	1
32	1	1	0	1	0	1	1	0	5	0.62	0
33 to 38	1	1	1	1	1	1	1	1	8	1	1
Proportion relevance	1	1	0.94	1	0.94	1	1	0.94	0.98	0.98	0.94

E= Expert

EA= Expert Agreement

UA= Universal Agreement.

i. **Experts in agreement**: Sum up the experts rating of each item. If an expert marked the item score either '3' (need minor changes) or '4' (relevant), then it is considered as agreed, if not disagreed. For an each agreed items the assigned score was '1'and for disagreed item '0'. For a example in item number 27 (1 + 1 + 0+1 + 0 + 1 + 1+ 0) = 5

ii. **Universal agreement (UA)**: If all experts agreed to the item then the score 'one', even one expert is not agreed then the score is zero.

iii. **I-CVI**: The total number of experts agreement divided by The total number of experts. For a example in item number 1, 8/8=1. In item number 27 and 32, five experts agreed and three experts rejected. So 5/8=0.62.

iv. **S-CVI/Ave** (based on I-CVI): The sum up of I-CVI score of all items divided by the total number of items, for example the S-CVI/Ave (38/38) is equal to 1.

v.**S-CVI/Ave** (based on proportion relevance): the average of proportion relevance scores across all experts, for example the S-CVI/Ave. for example expert one scale- content validity index is38 and total items is38. So, 38/38 is equal to 1. The average proportion scores of all scores are 1+1+1+1+1+1+1+1is equal to 8, the total experts are 8, hence, 8/8=1. Similarly, in item number 27 and 32 three experts rejected the items and the calculated value of S-CVI/Avebased on proportion relevance is 0.98.

vi. **S-CVI/UA**: The average of UA scores across all items, for example the S-CVI/ UA. S-CVI is 1 and UA is 0.94.

Based on the above calculation, we can conclude that I-CVI, S-CVI/Ave and S-CVI/UA meet satisfactory level, and thus the scale of questionnaire have achieved satisfactory level of content validity. Since three experts has been rejected the item number 27 and 32. It has been subjected for validity to the same experts after corrections as per their suggestions. It has been accepted by the experts.

Calculating content validity ratio: In addition to content validity index, content validity ratio was computed using Lawshe formula[13].

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

$\mathbf{n_e}$is the total number of experts considered the item as essential

N is the total number of experts in the panel

In CVR, experts identify the items as necessary for in use a construct in a set of items or not. In other hand, experts are asked to rate each item from 1 to 3. The rating ranges of "not necessary (1), useful butnot essential (2), essential (3)". CVR varies between +1 to −1. The value one indicates that the item is essential given by all the experts. It is based on the Lawshe table. To accept that the tool is valid only after all the item is considered "essential"[13].

Language validity:After establishing the content validity of the CASHS, the tool was translated into Tamil, by alanguage expert. The translated version was retranslated to English language by another expert, for establishing language validity. There was no ambiguity in any of the items or instruction, and so no modification was made.

Results and Discussion

The systematic approach of content validation should be done to consider that the tool is valid. The main purpose of validation is to identify the unrelated items which are to be removed and the items which need modification to be evaluated. The content validation is done to filter the not fit items. In this tool, computed CVI and CVR value is +1. Hence all items are considered as essential, and no modifications done.

Conclusion: Proper validation of tool is essential and it is crucial process in the newly constructed tool. There is no published tool till now related to HPV infections, HPV vaccination and cervical cancer. Moreover, this article described the sequential steps process of the content validity. This will be beneficial for health professionals in future investigations.

Acknowledgement: A special thanks to all the experts validated this tool.

Conflict of Interest: None

Source of Fund: Self

References

1. Haynes S. N, Richard D. C. S., and Kubany E. S. Content validity in psychological assessment: a functional approach to concepts and methods. Psychol. Assess. 1995; 7, 238–247.
2. ShuttleworthM . Content Validity. Jul 6, 2009. Retrieved Sep 04, 2020 from Explorable.com: https://explorable.com/content-validity.
3. Schiffman M, Castle PE, Jeronim J, Rodrigue AC, Wacholde S. Human papillomavirus and cervical cancer. Lancet. 2007;370:890–907.
4. Singh N. HPV and Cervical cancer - prospects for prevention through vaccination. Indian J Med Paediatr Oncol. 2005;26:20–3.

5. Castellsague X, Munoz N. Cofactors in human papillomavirus carcinogenesis - role of parity, oral contraceptives, and tobacco smoking. J Natl Cancer Inst Monogr. 2003;31:20–8.
6. Huang CM. Human Papillomavirus and vaccination. Mayo Clin Proc. 2008;83:701–7.
7. Rashid S, Labani S, Das BC. Knowledge, Awareness and Attitude on HPV, HPV Vaccine and Cervical Cancer among the College Students in India. *PLoS One*. 2016;11(11):e0166713. Published 2016 Nov 18. doi:10.1371/journal.pone.0166713.
8. Bangert-Drowns, R.. Literature review. In S. Mathison (Ed.), Encyclopedia of evaluation. 2005. 232-233). Thousand Oaks, CA: SAGE Publications, Inc. doi: http://0-dx.doi.org.leopac.ulv.edu/10.4135/9781412950558.n319.
9. Cooper H. M. Organizing knowledge syntheses: A taxonomy of literature reviews. Knowledge in Society. 1988;1(1):104–126.
10. Olayemi. Multiple choice questions as a tool for assessment in medical education. Ann BioMed Science. 2013;12(1):17-23.
11. Yaghmaie F. Content validity and its estimation. Journal of Medical Education. Spring. 2003; 3(1):25-27.
12. Rubio, D.M., Berg-Weger, M., Tebb, S.S., Lee, E.S., and Rauch, S. Objectifying content validity: Conducting a content validity study in social work research. Social Work Research. 2003;27 (1):94-104.
13. Lawshe, C.H. A quantitative approach to content validity. Personnel Psychology Lawshe, C.H, 1975. A quantitative approach to content validity. Personnel Psychology. 1975; 28 (1);563–575.