

Validity of semi-structured questionnaire for prevalence and risk factors of hepatitis B virus infections among women of reproductive age

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ABSTRACT

Introduction: Hepatitis B is a viral disease caused by the hepatitis B virus (HBV). This virus increasingly infects the population each year. The evidence focusing on the validity of a research tool in the South Sudan context is scant. This study examined the validity of the questionnaire for prevalence and risk factors of HBV infection among women of reproductive age in South Sudan.

Method: The study adapted a quantitative cross-sectional research design. Nine panelists were selected. Twenty-nine items of two key constructs, demographic characteristics and health behaviours, were assessed and analysed using formula 1 (Lawshe's Content Validity Ratio) and formula 2 (Lawshe's Content Validity Index) built-in Power Pivot of Microsoft Office 365.

Results: Twenty-nine questions of the constructs surpassed the content validity ratio threshold value of 0.78. Thus, we maintained these questions in the final semi-structured questionnaire. The demographic characteristic construct's overall content validity index (CVI) was 0.926, and the health behaviour construct was 0.928.

Conclusion: This study validated the semi-structured questionnaire for assessing the prevalence and risk factors of HBV infection among women of reproductive age in South Sudan. This tool identified the essential items in this health domain. Therefore, it should assist researchers in collecting data related to hepatitis B.

Keywords: hepatitis B virus, semi-structured questionnaire, validity, women of reproductive age

Introduction

Hepatitis B is a communicable viral infection that transmits from one person to others as may occur at the time of sexual contact. Sharp tools that have become contaminated with the virus pose a risk of transmission. Whereas a first infection with HBV is considered acute, a persistent infection lasting more than six months is a chronic infection. An HBV transmission from mother to child during birth and delivery is called a vertical transmission. Horizontal transmission refers to the

Table 1. Number of research participants

| Panellist Code | Filed of Expertise |
|----------------|---------------------------------------|
| E1 | Public Health |
| E2 | Pathology |
| E3 | Epidemiology |
| E4 | Health Systems and Management |
| E5 | Infectious Diseases |
| E6 | Public Health |
| E7 | Health Policies, Planning & Financing |
| E8 | Public Health |
| E9 | Obstetrics and Gynaecology |

passage from one host to another (e.g., exposure to or ingestion of infective material). In Africa, 82.3 million live with HBV, and at least 200,000 die each year.^[1,2] South Sudan is not an exception among the African countries. The country has been subjected to conflicts that have weakened the health system and the people's health status, particularly the women and children.^[3,4] The fragmented social structures exacerbate the transmission of HBV. Cultural patterns promote HBV transmission, e.g., inadequately sterilised tools used in ear piercing and tribal markings and eating together from common utensils.^[5]

Importantly, the research instruments refer to the set of key questions and probes that researchers use to gather data of interest.^[6] While diverse research tools exist, the semi-structured questionnaire is vital in collecting data related to HBV infection. The tool normally constitutes two sections. The section A consists of various questions related to the demographic characteristics of the study participants. The section B comprises questions relevant to HBV infection and risk factors among women of reproductive age. The questions emerged from the previous studies.^[5,7,8]

Reliability and validity are key for any questionnaire. Reliability assesses internal consistency and the stability of the measures, whereas validity examines the extent to which the tool is intended to measure. The basis of validating the interview guide is to minimise errors in the application process.^[9] Lawshe's Content Validity Ratio (CVR) analysis method has been widely used in content validity tests. The credibility of an instrument, whether developed or adapted, depends on its validity and reliability.^[6] Additionally, the evidence focusing on the validity of the semi-structured questionnaire in South Sudan is limited. Consequently,

Table 2. Main constructs and list of the items

| Main Construct and its items | Number of Items |
|---|-----------------|
| Demographic Characteristics | 12 |
| Name of health facility | |
| How old are you: age (in years)? | |
| What is your residential area in Juba City? | |
| What is your state or administrative area of origin in South Sudan? | |
| What is your religion? | |
| What is your highest level of Education? | |
| What is your occupation? | |
| What is your employment status? | |
| What is your marital status? | |
| Type of marriage | |
| Parity: How many children have you ever delivered alive? | |
| What is your family income per month in South Sudan pounds? | |
| Health behaviours | 17 |
| When you have manicure or pedicure, what instrument is used? | |
| Do you have scarification/tribal marks? | |
| Have you had a dental procedure? | |
| Have you ever received a blood transfusion? | |
| Have you had a surgical operation? | |
| Have you had any contact with a known case of hepatitis B? | |
| Have you ever used tobacco or shisha? | |
| Have you ever drunk alcohol? | |
| Have you received the hepatitis B vaccine? | |
| If yes, how many shots did you receive? | |
| If yes, what are the benefits of hepatitis B vaccine? | |
| If no, what are the barriers to uptake of hepatitis B vaccine? | |
| If no, do you intend to receive it in the future? | |
| Have you ever had jaundice? | |
| Have you ever been tested for hepatitis B? | |
| If yes, when did you have your most recent hepatitis B test? | |
| If yes, what was the result of your last hepatitis B test? | |

this research aimed to examine the content validity of a semi-structured questionnaire for the prevalence and risk factors of HBV infection among women of reproductive age in South Sudan. This tool, therefore, shall facilitate scholars in the quest for HBV-related concerns.

Method

This study adapted a quantitative cross-sectional research design to validate the contents of a research questionnaire. The panellists were selected based on the expertise relevant to this research study: public health, epidemiology, pathology, infectious diseases, obstetrics, and gynaecology, among other fields shown in Table 1. Nine panellists were selected, which is the sample size of this research study.^[10] (Table 1).

The instrument comprised two key constructs: demographic characteristics and health behaviours (Table 2). Demographic variables are independent by nature and cannot be altered. Demographic variables may be numerical (age, income) or discrete (marital status).^[11] Health behaviours are those that affect health and may be unintentional or intentional. Examples include unsafe sexual activities, substance abuse, seeking behaviours for health care, and adherence to recommended medical interventions.^[12]

Table 2 illustrates a total of 29 items. The experts used

the method of ranking these items following Likert’s three scales: (1) Not necessary, (2) Useful but not essential, and (3) Essential.^[13] Of the rated items, only the items rated as essential were considered for the analytic process using Formula 1 and Formula 2, built-in Power Pivot of Microsoft Office 365.

Formula 1: Lawshe’s Content Validity Ratio (CVR)

$$CVR = [ne - (N/2)] / (N/2)$$

Formula 2: Lawshe’s Content Validity Index (CVI)

$$CVI = ne/N$$

Where, ne ≡ Number of panellists who gave a rating of essential, N ≡ Total number of panellists.

Since the evaluation constituted nine experts, a minimum content validity ratio (CVR) of 0.78 was the threshold to retain the question in the final form or delete it. While CVR’s value determines each question’s validity, CVI provides the overall percentage of expert agreement on the questions. The CVI value ranges from 0.7 to 0.9, from acceptable to excellent. Nevertheless, a CVI < 0.7 indicates that the questionnaire might have issues, the instruction was unclear to the panellists, or the experts were biased/improperly selected.^[13]

Table 3. CVR Analysis for Demographic Characteristic (DC) Construct

| Items/xperts | E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | Ne | CVR |
|--------------|----|----|----|----|----|----|----|----|----|------------|--------------|
| DC01 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 8 | 0.778 |
| DC02 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| DC03 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| DC04 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| DC05 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 0.778 |
| DC06 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| DC07 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| DC08 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 0.778 |
| DC09 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 8 | 0.778 |
| DC10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| DC11 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| DC12 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 0.778 |
| | | | | | | | | | | CVI | 0.926 |

0 ≡ Not necessary and useful but not essential, 1 ≡ Essential

Table 4. CVR Analysis for Health Behaviour (HB) Construct

| Items/Experts | E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | Ne | CVR |
|---------------|----|----|----|----|----|----|----|----|----|------------|--------------|
| HB13 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 8 | 0.778 |
| HB14 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| HB15 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| HB16 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| HB17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| HB18 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| HB19 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 8 | 0.778 |
| HB20 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 0.778 |
| HB21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| HB22 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 0.778 |
| HB23 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| HB24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| HB25 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| HB26 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.778 |
| HB27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 1.000 |
| HB28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 8 | 0.778 |
| HB29 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 8 | 0.778 |
| | | | | | | | | | | CVI | 0.928 |

0 = Not necessary and useful but not essential, 1 = Essential

Ethical Considerations: Authorization and ethical clearance letters were obtained from the University of Juba Graduate College and the Ministry of Health Research Ethics Review Board. The study participants provided informed consent, and confidentiality was assured.

Results

Nine experts participated in validating 29 items of the questionnaire. Of these, 12 were demographic constructs, and 17 were health behaviour constructs. The CVI of the 29 items was 0.927.

Table 3 illustrates the analysis of CVR for demographic characteristic construct. All items of the demographic characteristic construct were retained as they passed the CVR threshold value of 0.78. These items include the name of the health facility, age in years, residential area in Juba City, religion, the highest level of education, employment status, marital status, and parity, among other variables. The overall CVI for the demographic characteristic construct stood at 0.926.

All items (17) of the health behaviour construct have surpassed the CVR threshold value of 0.78, and all were retained in the final semi-structured questionnaire. The overall CVI for the health behaviour construct was staged at 0.928 (Table 4).

Discussion

This study examined the content validity of the questionnaire for prevalence and risk factors of HBV infection among women of reproductive age in South Sudan. The 29 items of the questionnaire were adapted from previous studies. The derived items were age, residential area, religion, education, employment status, marital status, obstetric parity, substance use, tribal marks, and adherence to prescribed medical strategies.^[5,7,8] Whether the research instrument is developed, standardized, or adapted, the validity must be established before using an instrument.^[6] As a result, this study identified 29 items that surpassed the content validity ratio (CVR) threshold value of 0.78 or 78%.

From Lawshe, *“Any item, performance on which is perceived to be “essential” by more than half of the panellists, has some degree of content validity. The more panellists (beyond 50%) who perceive the item as “essential,” the greater the extent or degree of its content validity.*^[10]

Furthermore, this study revealed that the overall content validity index (CVI) for demographic characteristics and health behaviour constructs were staged at 0.926 and 0.830, respectively. These findings were in congruence with literature that asserts that the CVI of value ranges from 0.7 to 0.9, from acceptable to excellent. Nonetheless, a low CVI value indicates that the instrument might have problems with the items, unclear instruction to the experts, improper expert selection, or the expert himself is biased. Whereas CVR provides validity for each item, CVI describes the percentage of expert agreement for overall items in the instrument.^[13]

Conclusion

The study necessitated validating a semi-structured questionnaire for assessing the prevalence and risk factors of hepatitis B virus among women of reproductive age. This tool indicated the essential items in this health domain. Therefore, it should assist researchers in collecting data related to hepatitis B.

Conflict of interest: None

Sources of funding: None

Author contributions: EW conceptualised this research study, managed the research study, arranged the methods, managed and processed the data, and drafted the manuscript; AC contributed to the concept of this study, provided a key role in shaping the direction of the research study and the manuscript writing; OS contributed to the conceptualizing this study, administrated research project and the manuscript writing; all authors reviewed the final manuscript and approved it for publication.

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