ORIGINAL ARTICLE

CONTENTS

Validation of Ukrainian breast and cervical cancer screening questionnaire

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ABSTRACT

Aim: This study aimed to develop and validate the Ukrainian Breast and Cervical Cancer Screening Questionnaire (UBC-SQ) to assess women's believes, behavior, knowledge and practices toward breast cancer and cervical cancer screening.

Materials and Methods: The validation study was conducted between June 2023 and January 2024 in Uzhhorod, Ukraine, among women aged 21–74, recruited through social centers for internally displaced persons and a family medicine clinic. Participants completed the questionnaire either online or on paper.

Results: The UBC-SQ was adapted from the two prototypes about breast and cervical cancer screening behaviour using translation and back-translation. Content validity was confirmed by expert review (CVR ≥ 0.62, CVI ≥ 0.79). External validity was assessed through item impact scores (IIS ≥ 1.5). Reliability was evaluated using test-retest (Weighted Kappa ≥ 0.3) and internal consistency (Cronbach's alpha ≥ 0.7).

Conclusions: The UBC-SQ is a valid, reliable, and culturally appropriate tool for assessing BC and CC screening believes, behavior, knowledge and practices in Ukrainian women.

KEYWORDS: health promotion, neoplasms, war, health services organization, noncommunicable diseases, global burden of disease

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INTRODUCTION

Breast cancer (BC) emerges as the most common diagnosis among women, spanning both developing and developed countries. In 2022, approximately 2.3 million breast cancer cases were who had been diagnosed with breast cancer in the past five years, making it the most prevalent cancer worldwide [1]. Cervical cancer (CC) on the other hand is on the 4th position as the commonly diagnosed cancer in women [2]. Notably, 604,000 episodes of cervical cancer were diagnosed worldwide. Moreover, CC ranks first place in women in 36 low-and middle-income countries [3].

In Ukraine there are no state based screening program have been organized for BC and CC [4]. National screening programs were reported in Ukraine in 2002–2006, [5] but they are no longer mentioned. Now in Ukraine, the primary strategy for screening of BC is annual preventive gynecological examinations to all females aged 18 and above, which include a clinical breast examination with follow-up diagnostic mammography if needed [6]. The opportunistic BC and CC screening carried out across Ukraine varies in quality as well as the initiatives to increase awareness of women and vigilance of doctors [7]. The report of World Health Organization (WHO) showed that the incidence of BC in Ukraine was 43.4% and 19.4% for CC. Mortality rate was 13.3% and 7.0% for BC and CC respectively [1]. National Cancer Registry of Ukraine (NCRU) in 2022 reports that five-year prevalence of BC stands at 25.1% and 6.0% for CC as of 2022. In 2021, only 28.8% of BC episodes were detected during screening [8], with 24.2% for CC [9].

Ongoing war in Ukraine over the past two years forced millions of Ukrainian women to leave their homes [10]. Many of them were forced to find themselves in conditions where prolonged stress, social and economic problems shift the vector of priority from disease prevention and life extension to solving urgent issues [11]. In addition, the change of place of residence, the destruction of health care infrastructure, the outflow of medical professionals, the absence of state screening programs shifts focus of patients and doctors from prevention to management immediate medical needs [12].

Table 1. UBC-SQ first version

Statement	Answers
Q1. Treatment prescribed to breast cancer patients can only prolong the period of suffering.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q2. Treatment for cervical cancer patients can only prolong the period of suffering.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q3. Even if breast cancer is diagnosed at early stages, there is a very small chance that the patient will survive.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q4. Even if cervical cancer is diagnosed at early stages, there is a very small chance that the patient will survive.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q5. If a woman's fate is to get breast or cervical cancer, she will definitely get it.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q6. Screening for breast and cervical cancer should only be done if there are relevant complaints.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q7. A healthy lifestyle (healthy diet and exercise, avoiding smoking, alcohol, etc.) will help me avoid breast and cervical cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q8. I only see a doctor when I feel sick or have symptoms of illness.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q9. Only women with a family history (among close relatives) of the disease are at risk of getting breast cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q10. Only women with a family history (among close relatives) of the disease are at risk of getting cervical cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q11. I am afraid to have a Pap smear because I don't understand what will be done.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*

Table 1. Cont.

Q12. I know that screening for early detection of breast and cervical cancer in our country is free.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q13. A cervical smear (Papanicolaou test) will help me detect cervical dysplasia early	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q14. Mammography is the only scientifically proven method for early detection of breast cancer	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q15. I am worried that having a mammogram will hurt my breasts	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q16. Human papillomavirus can cause cervical cancer	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q17. I regularly perform breast self-examination for early detection of breast cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q18. Having a Pap smear is too embarrassing.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q19.It would be difficult to arrange transportation for getting a mammogram.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*

Source: compiled by the authors of this study

The analysis of a few studies examining BC and CC incidence shows that there is tendency of increasing BC and CC attributed to the impact of armed conflicts on healthcare infrastructure, access to screening, and overall health-seeking behaviors of the population [13].

Research group of family doctors of the international family medicine clinic (Uzhhorod, UA) dedicated to help internally displaced people (IDPs) who fled from the East to the West of Ukraine because of Russian aggression, evaluated the numbers of referrals of IDPs women for BC screening [14]. A total of 2,500 medical records of family doctors were analysed (378 of them were women of 40-74y.o.). During the observation period, only 17 (4.5%) of all IDPs women aged 40-74 who visited the clinic underwent mammography. Among the indicated number, 6 of the women visited a doctor for screening, the rest sought medical help for other gynecological pathology and were referred by a doctor for screening tests [14] .

Since our data suggests that screening rates among IDPs women backgrounds are low and literature search show that there is a lack of evidence which conclusively demonstrates specific knowledge, beliefs, and attitudes that significantly influence women's cancer screening behaviors in Ukraine. Consequently, the development of a reliable assessment tool for evaluating believes,

Table 2. Final version of UBC-SQ

Statement	Answers
Q1. Treatment prescribed to breast cancer patients can only prolong the period of suffering.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q2. Treatment for cervical cancer patients can only prolong the period of suffering.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q3. Even if breast cancer is diagnosed at early stages, there is a very small chance that the patient will survive.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q4. Even if cervical cancer is diagnosed at early stages, there is a very small chance that the patient will survive.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q5. Screening for breast and cervical cancer should only be done if there are relevant complaints.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q6. A healthy lifestyle (healthy diet and exercise, avoiding smoking, alcohol, etc.) will help me avoid breast and cervical cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q7. I only see a doctor when I feel sick or have symptoms of illness.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q8. Only women with a family history (among close relatives) of the disease are at risk of getting breast cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q9. Only women with a family history (among close relatives) of the disease are at risk of getting cervical cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q10. I know that screening for early detection of breast and cervical cancer in our country is free.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q11. A cervical smear (Papanicolaou test) will help me detect cervical dysplasia early	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*

Table 2. Cont.

Q12. Mammography is the only scientifically proven method for early detection of breast cancer	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q13. Human papillomavirus can cause cervical cancer	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q14. I regularly perform breast self-examination for early detection of breast cancer.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*
Q15. Having a Pap smear is too embarrassing.	*- Strongly Agree* *- Agree* *- Undecided* *- Disagree* *- Strongly Disagree*

Source: compiled by the authors of this study

behavior, knowledge and practices related to BC and CC screening is crucial. Such tool would be essential for devising effective interventions aimed at promoting screening practices for both BC and CC.

AIM

This study aimed to develop and validate the Ukrainian Breast and Cervical Cancer Screening Questionnaire (UBC-SQ) to assess women's believes, behavior, knowledge and practices toward breast cancer and cervical cancer screening.

MATERIALS AND METHODS

To achieve the objective, we utilized two validated questionnaires: Breast Cancer Screening Beliefs Questionnaire (BCSBQ) and the Pap Smear Belief Questionnaire (PSBQ) [15,16]. Validation process was conducted between June 2023 and January 2024 in Ukraine. Women were recruited through social centers for IDPs and family medicine clinic in Uzhhorod, Ukraine. The research on the validation of the UBC-SQ received ethical approval from the Ethics Committee of Uzhhorod National University.

All participants invited to the research were informed about the study details, including potential risks and benefits. All participants gave informed consent prior to their involvement in the study. The study included women aged 21-74 who were literate. Participants with a history of BC or CC were excluded. They could then choose to complete the questionnaire either on paper or online. Additional participants were recruited through "snowball" method, where current participants invited others to join the study online. Those who gave agreement to participate completed the questionnaire, available in Ukrainian, which took approximately 10 minutes (Table 1, Table 2).

Participation by a minimum of 40 women out of 100 invited to participate and 10 experts in cancer screening were recruited into the validation process [17,18]. Methodological steps followed in fig.1:

INSTRUMENT

BCSBQ was originally developed and validated by Kwok et al. (2010), as instruments for assessing women believes, knowledge and attitudes regarding BC screening. After that BCSBQ undergone validation process in women in various cultural contexts, including Vietnamese [19], African [20], Indian [21], Arabic [22], and Korean [23] communities. Each adaptation of the BCSBQ has demonstrated reliability and validity, as evidenced by positive validation outcomes. PSBQ assessing women's attitudes and beliefs concerning the Pap test and CC screening. The questionnaire was developed by Ackersone et al to support public health initiatives and gynecological services for women in the USA and showed a role in understanding believes about CC screening and informing interventions aimed at promoting women's health [16].

AI STATEMENT

The author states that no AI tools were used in writing this article.

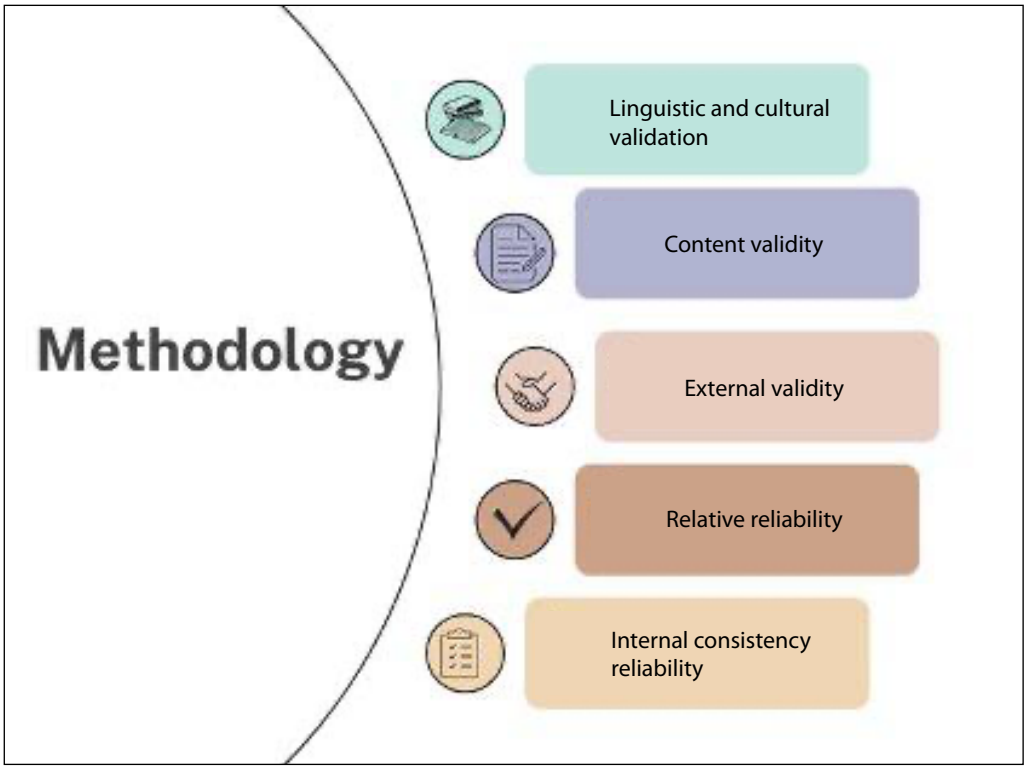

Fig. 1. Methodological steps of validation of UBC-SQ

RESULTS

LINGUISTIC AND CULTURAL VALIDATION

The first stage of validation was conducted, which included linguistic and cultural validation. Both prototype questionnaires were translated into Ukrainian based on the forward-backward translation protocol [24]. Initially, two English speaking doctors - experts independently translated the questionnaires into Ukrainian and then, the authors developed a combined final translation of UBC-SQ based on their translations and the aim of study. After that, two other experts (English speaking general medicine practice specialists) independently back translated the final version of the questionnaire into English [25]. The two translators and researcher combined the results of the translations. They made a final translation of UBC-SQ.

VALIDITY ASSESSMENT

Content validity assessment was conducted in two stages: qualitative and quantitative. Qualitative stage involved surveying 10 independent experts, including PhD in medicine, gynecologist, general practitioners, psychologist, and medical education instructors. They selected questions that corresponded to the set goal and objectives of the study. Experts could recommend changes to the questionnaire items based on linguistic and cultural peculiarities of surveyed population. Selected statements reproduce patients' beliefs, knowledge, attitudes regarding BC and CC screening.

In quantitative stage we calculated Content Validity Ratio (CVR) and Content Validity Index (CVI). Ten experts were asked to evaluate the importance and relevance of the questionnaire statements, providing additions and comments as necessary. For CVR calculation, the experts rated UBC-SQ items as "Essential" (scored 1), "Not essential, but useful" (scored 2), and "Not essential" (scored 3), with a minimum required CVR of 0.62 (Table 3) (26,27). To calculate CVI, the specialists rated the relevance of the items on the following: 1 - "Irrelevant"; 2 - "Somewhat relevant"; 3 - "Acceptably relevant"; 4 - "Completely relevant". CVI of 0.79 were acceptable (table 3) [26,27].

External validity. For this purpose, 10 women aged 21-74 y.o assessed the importance of each questionnaire item based on 5-point Likert scale (where 1 - not important at all, and 5 - very important). Based on the survey, the Item Impact Score (IIS) was assessed. IIS ≥ *1,5* is accepted as relevant for research (table 3).

Table 3 shows CVR values ranges from 0.43 to 1.0. Value 0.62 and more indicates the expert's agreement that the item must be included to questionnaire. CVR value less than 0.45 explains the experts disagree and statements were eliminated from the questionnaire. Based on CVR calculations we excluded from the ques-

Table 3. Content validity and external validity results of Ukrainian Breast and Cervical Screening questionnaire

Statement	Content Validity Ratio (CVR)	Content Validity Index (CVI)	Item Impact Score (IIS)
Q1. Treatment prescribed to breast cancer patients can only prolong the period of suffering	0.63	0.9	1.95
Q2. Treatment for cervical cancer patients can only prolong the period of suffering	0.63	0.9	2.00
Q3. Even if breast cancer is diagnosed at early stages, there is a very small chance that the patient will survive	1	1	2.04
Q4. Even if cervical cancer is diagnosed at early stages, there is a very small chance that the patient will survive	1	1	1.81
Q5. If a woman's fate is to get breast or cervical cancer, she definitely will get it	0.63	0.9	2.2
Q6. Screening for breast and cervical cancer should only be done if there are relevant complaints	1	1	2.08
Q7. A healthy lifestyle (healthy diet and exercise, avoiding smoking, alcohol, etc.) will help me avoid breast and cervical cancer	0.82	1	1.91
Q8. I only see a doctor when I feel sick or have symptoms of illness	0.82	0.9	1.87
Q9. Only women with a family history (among close relatives) of the disease are at risk of getting breast cancer	0.82	0.9	1.95
Q10. Only women with a family history (among close relatives) of the disease are at risk of getting cervical cancer	0.63	1	1.91
Q11. I am afraid to have a Pap smear because I don't understand what will be done	0.43	0.65	
Q12. I know that screening for early detection of breast and cervical cancer in our country is free	0.63	1	1.87
Q13. A cervical smear (Papanicolaou test) will help me detect cervical dysplasia early	1	1	1.77
Q14. Mammography is the only scientifically proven method for early detection of breast cancer	1	1	2.04
Q15. I am worried that having a mammogram will hurt my breasts	0.42	0.62	
Q16. Human papillomavirus can cause cervical cancer	0.82	1	2.1
Q17. I regularly perform breast self-examination for early detection of breast cancer	0.63	1	2.0
Q18. Having a Pap smear is too embarrassing	0.60	0.70	
Q19.It would be difficult to arrange transportation for getting a mammogram	0.80	0.65	1.2

Source: compiled by the authors based on [26, 27]

tionnaire Q11 and Q15 and Q18. In table 1 the level of CVI were <0,79 in Q11, Q15, and Q19 which showed that experts decided that they are not relevant for the aim of study. External validity was assessed by 10 women from target population. They evaluated how relevant and important each statement of the UBC-SQ. The results of calculation are presented in Table 1 in the 3rd column. After of the evaluation of the IIS index Q19 has been esteemed by women as not important (IIS Q19 = *1,2)*.

RELIABILITY

Relative reliability was assessed using the test-retest method, where 30 participants completed the UBC-SQ twice, with a two-week interval. We calculated interrater reliability (IRR) using Weighted Kappa (calculation of more than 0.3 were accepted), reflecting the level of agreement between two rates [28] (table 4).

Based on evaluation we excluded Q5 from the questionnaire as Weighted Kappa was less than 0.3 (p=0.142). Internal consistency which reflected how closely related the questionnaire items were evaluated by Cronbach's alpha. The coefficient ranges from 0 to 1 indicate greater reliability. A minimum acceptable value is generally considered to be 0.7. Low level of Cronbach alpha means there is low degree of homogeneity in the questionnaire [29]. In our study, the Cronbach's alpha coefficient was calculated as 0,75. This result indicates

Table 4. Calculation of IIR of statements of the UBC-SQ

Statements	Weighted Kappa	p-value	Statements	Weighted Kappa	p-value
Q1	.915	<.001	Q9	.948	<.001
Q2	.956	<.001	Q10	1.000	<.001
Q3	.847	<.001	Q12	.902	<.001
Q4	1.000	<.001	Q13	.953	<.001
Q5	.151	.142	Q14	.930	<.001
Q6	.881	<.001	Q16	.953	<.001
Q7	1	<.001	Q17	1.000	<.001
Q8	.443	<.001			

Source: compiled by the authors based on [28]

a satisfactory level of internal consistency, suggesting that the statement in the questionnaire is adequately aligned for evaluation Ukrainian women believes, behavior, knowledge and practices towards BC and CC screening.

DISCUSSION

The aim of this study was to validate the UBC-SQ. Our findings demonstrate that this questionnaire can be effective tool for understanding women believes, behavior, knowledge and practices towards BC and CC screening. The high scores on CVR an CVI suggest that the included items are both relevant and essential for the target population additionally the satisfactory ICR reflected by Cronbach's alpha confirms that the questionnaire is reliable for repeated measures.

One of the major strengths of this study is the methodological approach, including forward-backward translation, expert reviews, and comprehensive validity and reliability assessments.

This thorough process ensures that the questionnaire is appropriate for the Ukrainian context culturally and linguistically. Similar approaches are considered essential in international research, where forward-backward translation, expert committee review, and pretesting are standard steps for cross-cultural adaptation to preserve semantic, conceptual, and functional equivalence of the instrument [24].

However, a limitation of the study is the relatively small sample size used for test-retest reliability and external validity assessments. Our findings are consistent with previous validation studies were conducted in various cultural contexts, including Vietnamese, African, Arabic, Korean and the US communities [16,19-23]. This cross-cultural consistency highlights the robustness of the questionnaires in diverse settings. From the other side in Ukraine there is lack of validated questionnaires for evaluation believes, behavior, knowledge and practices of BC and CC screening. The validated UBC-SQ can become a reliable tool for researches and healthcare practitioners to understand what Ukrainian women believes, behaviour, knowledge and practices towards BC and CC screening. Similar questionnaires has been used in many countries to link knowledge, believes, attitudes with actual screening behaviours in different countries [31-33]. This knowledge can help to design better public health campaigns and education programs to promote early detection of BC and CC in Ukraine. Policymakers can also use UBC-SQ to check how current screening recommendations work and make better decisions to improve women's health. Longitudinal studies focused on more people from different demographics could assess the stability of the UBC-SQ over time. Additionally, we can use this tool to study how education programs affect people's knowledge, beliefs, and attitudes about cancer screening and could give useful ideas for improving public health in Ukraine.

CONCLUSIONS

The validation process confirmed that the Ukrainian breast and cervical cancer screening questionnaire is culturally relevant, valid, and reliable for evaluating believes, behavior, knowledge and practices related to breast and cervical cancer screening.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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