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WOMEN'S EDUCATION AS A DETERMINANT OF KNOWLEDGE AND PRACTICES IN THE PREVENTION OF BREAST AND CERVICAL CANCER. STUDY RESULTS

Introduction. The war in Ukraine has disrupted healthcare, shifting focus from prevention to urgent medical care. The study aimed examined how women's education influences believes, knowledge and practices related to the prevention of breast and cervical cancer.

Material and methods. The survey of women aged 21–74 years, used the validated "Ukrainian Breast and Cervical Cancer Screening Questionnaire". Data were analysed with descriptive statistics and the Kruskal–Wallis H-test.

Results. A total of 198 women participated, predominantly aged 30–65 with higher education (69.1%). Education level influenced certain beliefs and behavioral practices: women with higher education were more likely to reject pessimistic views on breast cancer treatment ($p=0.048$) and showed greater awareness of the Pap smear test ($p=0.005$) and HPV's role in cervical cancer ($p<0.001$). Those with lower education levels more often supported a reactive approach to screening ($p=0.021$) and delayed seeking medical help until symptoms appeared ($p=0.041$). They also had misconceptions regarding family history as the sole risk factor for breast cancer ($p<0.05$). No differences were found in knowledge of mammography and breast self-examination.

Discussion. While education showed minimal impact on perceptions of cancer treatment and prognosis, it significantly influenced awareness, critical evaluation of myths, and proactive screening behavior. These findings underscore the need for education-sensitive strategies to improve BC and CC prevention in Ukraine.

Conclusions. Level of education partly shapes women's perceptions and knowledge of breast and cervical cancer.

Key words: primary health care, disease burden, noncommunicable diseases, sex factors, neoplasms, management, motivation, health care organization, health care management, gender, health promotion.

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ОСВІТА ЖІНОК ЯК ЧИННИК ЗНАНЬ І ПРАКТИК ПРОФІЛАКТИКИ РАКУ МОЛОЧНОЇ ЗАЛОЗИ ТА ШИЙКИ МАТКИ. РЕЗУЛЬТАТИ ДОСЛІДЖЕННЯ

Вступ. Війна в Україні зумовила масову внутрішню міграцію населення, що створило нові виклики для системи охорони здоров'я. У таких умовах профілактика відступила на другий план, поступившись нагальним медичним потребам.

Мета роботи: оцінити вплив рівня освіти жінок на їхні знання та практики щодо профілактики раку молочної залози та шийки матки.

Матеріали та методи. Анкетування жінок 21–74 років, за допомогою валідованого «Українського опитувальника щодо скринінгу раку молочної залози та шийки матки» із застосуванням описової статистики та H-test (Крускалл-Уолліса).

Результати. Отримано 198 відповідей. Переважали жінки з вищою освітою (69,1%) віком 30–65 років. Встановлено, що рівень освіти частково впливає на знання, переконання та поведінкові практики. Статистично значущі відмінності виявлені у ставленні до лікування РМЗ: жінки з вищою освітою частіше відкидали песимістичні погляди ($p=0,048$), мали кращу обізнаність щодо ПАП-тесту ($p=0,005$) та ролі ВПЛ у виникненні РШМ ($p<0,001$). Учасниці з нижчим рівнем освіти частіше підтримували реактивний підхід до скринінгу ($p=0,021$), відкладали звернення до лікаря до появи симптомів ($p=0,041$) та мали хибні уявлення щодо сімейного анамнезу як єдиного фактора ризику РМЗ ($p<0.05$). Рівень освіти не впливав на знання про мамографію та практику самообстеження молочних залоз.

Обговорення. Хоча освіта мала мінімальний вплив на уявлення про лікування та прогноз, вона істотно визначала обізнаність, критичне ставлення до міфів і готовність до проактивної участі у скринінгу.

Висновки. Рівень освіти частково визначає уявлення та знання жінок про рак молочної залози і шийки матки.

Ключові слова: первинна медична допомога, глобальний тягар хвороб, неінфекційні захворювання, організація охорони здоров'я, управління системою охорони здоров'я, стать, злоякісні новоутворення, менеджмент, мотивація, промоція здоров'я.

Introduction. Social determinants of health including education, income level, access to healthcare, and social interventions play critical role in patients attitudes toward screening [1]. The effectiveness of preventive strategies depends by population awareness and their health-related practices [2, 3]. Education level is one of important determinant, as it affects attitudes and readiness to participate in screening programs [1, 4, 5]. In Ukraine, the ongoing armed conflict has further exacerbated challenges in preventive healthcare services. Armed conflicts lead to mass population displacement. Millions of people had to leave their homes and relocate to safer regions or abroad [6, 7]. In this context, medical priorities have shifted, with both healthcare providers and patients focusing firstly on management of acute and urgent conditions rather than prevention [8]. Breast cancer (BC) is the most common onco-

logical disease among women [9]. In the study conducted in Uzhhorod, Ukraine, we found that only 4.5% of female patients aged 40–74 y.o. underwent mammography during the observation period. Of these, one-third attended for preventive purposes, while the remainder were referred by physicians during visits for other reasons (10). These preliminary findings highlighted substantial gaps in screening uptake and served as the foundation for a more comprehensive investigation. Based on our previous results we aimed to assess women's knowledge, beliefs, and attitudes toward BC and cervical cancer (CC) screening, and to compare these across groups stratified by educational level.

Materials and Methods. To address the aim, the research team developed and validated the Ukrainian Breast and Cervical Cancer Screening Questionnaire (UBC-SQ) (Appendix 1), based on international methodological guidelines [11–14]. The UBC-SQ was adapted from two instruments: the Breast Cancer Screening Beliefs Questionnaire (BCSBQ) [15] and the Pap Smear Belief Questionnaire (PSBQ) [16]. The BCSBQ has been validated among women from diverse cultural backgrounds, including Vietnamese, African, Indian, Arab, and Korean populations [17–22]. The PSBQ was designed to capture women's attitudes toward Pap testing and CC screening, supporting public health and gynecological initiatives in the United States [16].

Inclusion criteria: women aged 21–74 years without a prior history of BC or CC, who provided informed consent. Data were collected using either a paper-based or electronic version of the UBC-SQ, according to participants' preferences. Statistical analysis included descriptive statistics and the Kruskal–Wallis non-parametric H-test to examine associations between educational level and responses. Statistical significance was set at $p<0,05$, with Bonferroni correction applied for multiple comparisons.

Results. A total of 198 women completed the survey. Sociodemographic characteristics of the respondents are summarized in Table 1.

All items of the UBC-SQ were categorized into three domains: perceptions of BC and CC (Q1–Q4), behaviors and attitudes (Q5–Q10), and knowledge related to BC and CC screening (Q11–Q15) (Appendix 1).

Table 1

Sociodemographic characteristics

Age distribution	21–29 years – 18.1% 30–39 years – 37.2% 40–65 years – 38.8% 65+ years – 5.9%
Education	Higher – 69.1% Secondary specialized – 24.5% Secondary – 6.4%
Family history of BC	Yes – 13.8% No – 86.2%
Detected human papillomavirus (HPV)	Yes – 13.8% No/Not tested – 86.2%

Level of education was classified into three categories: HE – higher education, SE – secondary education, and SSE – specialized secondary education. Responses to each item were assessed using a five-point Likert scale (1 – "strongly agree" to 5 – "strongly disagree"). The results of the analysis examining the impact of educational level on women's beliefs regarding BC and CC (items Q1–Q4) are presented in Table 2.

The analysis revealed that only for item Q1, *"Breast cancer treatment can only prolong the period of suffering"* (Table 3), a statistically significant difference was observed between women with different educational levels. No significant differences were detected for the other items (Q2–Q3). The significant difference for Q1 was found between women with HE and those with SSE. Although the median score for both groups was identical (4 – "disagree"), the distribution of responses differed. Women with HE showed more consistent disagreement with this statement (less variability toward agreement/uncertainty) compared with those with SSE.

Comparisons by educational level also revealed several patterns in attitudes toward prevention and screening of BC and CC (Table 4). Fatalistic beliefs (Q5) did not differ between groups: regardless of education, participants

Table 2

Influence of education level on beliefs regarding BC and CC

Statement	H-test	P-value
Q1. Treatment prescribed to breast cancer patients can only prolong the period of suffering	6.32	0.042
Q2. Treatment for cervical cancer patients can only prolong the period of suffering	5.18	0.075
Q3. Even if breast cancer is diagnosed at early stages, there is a very small chance that the patient will survive	4.01	0.135
Q4. Even if cervical cancer is diagnosed at early stages, there is a very small chance that the patient will survive	3.94	0.140

Table 3

Pairwise comparisons of groups by education level (only significant results)

Statement	Group comparison*	p-value (Bonferroni)	Group medians (H/ S / SS)
Q1. Treatment prescribed to breast cancer patients can only prolong the period of suffering	H vs SS	0.048	H=4, SS=4
	H vs S	0.512	H=4, S=4
	S vs SS	0.789	S=4, SS=4

*H = higher education, S = secondary education, SS = secondary specialized education

demonstrated a similar perception of disease inevitability. Similarly, no differences were observed in the belief that a healthy lifestyle contributes to cancer prevention (Q7).

In contrast, several other items showed statistically significant differences between educational groups (Table 4). Women with SSE were more likely to believe that cancer screening is necessary only in the presence of symptoms (M=4) compared with women with HE (M=5; p=0.021). A similar trend was observed regarding health-care-seeking behavior: women with SSE were more likely to delay visiting a physician until symptoms appeared (M=3) compared with participants with HE (M=4, p=0.041).

The most pronounced differences were observed in women's knowledge of risk factors. The belief that BC occurs only in the presence of a family history was more common among women with SE (M=4) and SSE (M=4) education compared with those with HE (M=5, p=0.031 and p=0.028, respectively).

Similarly, the perception that the risk of CC is determined exclusively by heredity was more prevalent among respondents with SE (M=4) and SSE (M=4) compared with women with HE (M=5). These differences were confirmed by the Kruskal–Wallis test (H=9.01, p=0.011) and subsequent pairwise comparisons (p=0.027 and p=0.022, respectively).

We also identified differences in knowledge and screening practices according to educational level (Table 5). For item Q11, substantial differences between groups were observed (p=0.002). Women with HE demonstrated greater awareness (M=2) compared with respondents with SSE (M=3, p=0.001) and SE (M=2.5, p=0.045).

Statistically significant differences were also found for item Q12, which assessed *knowledge of the Pap test*. Women with HE (M=2) exhibited higher awareness than respondents with SSE (M=3, p=0.005). In the SE group, the differences were less pronounced, although the overall trend persisted.

The analysis did not reveal statistically significant differences between educational groups (H=2.15, p=0.341) for item Q13 (*knowledge about mammography*). This indicates that regardless of educational level, respondents demonstrated a similar level of knowledge about mammography as a BC screening test.

The most pronounced differences by education level were observed for knowledge regarding the role of HPV

Table 4

Differences by educational level in women's attitudes, beliefs, and behaviors toward BC and CC screening

Statement (summarized)	H-test	p-value	Main pairwise differences (p<0.05)
	4.92	0.085	None
Q6. A healthy lifestyle (healthy diet and exercise, avoiding smoking, alcohol, etc.) will help me avoid breast and cervical cancer (Reactive approach to screening).	7.45	0.024	SS>H (p=0.021)
Q7. I only see a doctor when I feel sick or have symptoms of illness (Belief in primary prevention).	1.15	0.562	None
Q8. Only women with a family history (among close relatives) of the disease are at risk of getting breast cancer (Reactive help-seeking behavior).	6.18	0.045	SS>H (p=0.041)
Q9. Only women with a family history (among close relatives) of the disease are at risk of getting cervical cancer (Misconception about risk).	8.75	0.013	S>H (p=0.031) SS>H (p=0.028)
Q10. I know that screening for early detection of breast and cervical cancer in our country is free (Misconception about risk).	9.01	0.011	S>H (p=0.027) SS>H (p=0.022)

*H = higher education, S = secondary education, SS = secondary specialized education

Table 5

Differences in knowledge and screening practices by educational level

Statement	H-test	p-value	Groups with lowest scores (median)	Significant pairwise differences
Q11. Cervical smear (Papanicolaou test) will help me detect cervical dysplasia early (Awareness of BC screening).	12.58	0.002	SS (3) S (2.5)	H(2)> SS (p=0.001) H>S (p=0.045)
Q12. Mammography is the only scientifically proven method for early detection of breast cancer (Knowledge of Pap test).	10.25	0.006	SS (3)	H(2)>SS (p=0.005)
Q13. Human papillomavirus can cause cervical cancer (Knowledge of mammography).	2.15	0.341	none	nonsignificant differences
Q14. I regularly perform breast self-examination for early detection of breast cancer (Knowledge of HPV role).	15.93	0.0004	SS (3) S (2.5)	H(2)>SS (p<0.001) H>S (p=0.018)
Q15. Having a Pap smear is too embarrassing (Self-examination practice).	4.11	0.128	none	nonsignificant differences

*H = higher education, S = secondary education, SS = secondary specialized education

in the development of CC (H=15.93, p=0.0004). Women with HE (M=2) was significantly more knowledgeable than those with SSE (M=3, p<0.001) and SE (M=2.5, p=0.018). In contrast to previous items, education level did not significantly influence knowledge regarding breast self-examination (Q15) (H=4.11, p=0.128). Across all groups, respondents reported similar practices related to breast self-examination.

Discussion. Educational level demonstrated only a limited impact on women's perceptions of the effectiveness of BC and CC treatment. The sole significant difference was observed for the belief regarding BC treatment, where women with HE expressed more consistent disagreement with a pessimistic statement compared to those with SSE. No statistically significant differences were identified between educational groups in perceptions of prognosis for BC or CC (p>0.05), suggesting that views on survival outcomes are consistent regardless of education. This may indicate that basic perceptions of treatment efficacy and survival are shaped less by education and more by prevailing societal stereotypes.

Several patterns emerged across other domains. Women with HE was less likely to adopt a reactive approach toward screening or healthcare-seeking behavior and were less likely to hold misconceptions that BC or CC occurs only in women with a positive family history. In contrast, fatalistic beliefs, and confidence in the preventive role of a healthy lifestyle were not associated with education. This suggests that education primarily influences the ability to critically evaluate myths and fosters a more proactive stance toward medical examinations, while exerting little effect on underlying psychological attitudes.

The most substantial differences across groups were identified in the domain of knowledge. Women with HE demonstrated greater awareness of early detection methods, particularly Pap testing and the role of HPV in CC development. However, the frequency of breast self-examination practices was not influenced by education level. It should be noted that international guidelines do not recommend breast self-examination as a screening method [23].

***Strengths and Limitations**:* This study is among the few in Ukraine to evaluate the relationship between women's educational attainment and their perceptions, knowledge, and behaviors related to BC and CC screening. The survey included a broad age range of participants and encompassed diverse educational backgrounds. The use of both paper-based and electronic questionnaires enhanced accessibility and improved sample representativeness.

Nevertheless, some limitations should be acknowledged. The relatively small sample size limits the generalizability of the findings to the wider female population in Ukraine. Furthermore, the voluntary nature of participation may have introduced selection bias, as more motivated and knowledgeable women may have been more likely to take part.

The findings highlight the importance of tailoring preventive education programs on BC and CC to the educational background of the target audience. For women with lower levels of education, information about screening should be presented in simple, accessible formats, with particular emphasis on dispelling myths such as heredity being the sole risk factor. For women with HE, the focus should shift toward reinforcing practical skills in prevention and ensuring regular participation in screening programs, as knowledge alone does not always translate into action.

Conclusions. The study demonstrates variations in knowledge, beliefs, and practices regarding BC and CC screening across educational groups. Women with HE exhibited greater awareness and were less likely to hold erroneous or fatalistic beliefs, whereas those with lower educational attainment were more likely to adopt a reactive approach toward screening and healthcare utilization.

Prospects for further research. As part of the continuation of this study, statistical analysis of the influence of age on women's knowledge, beliefs, and attitudes toward BC and CC screening is planned. In addition, future research will focus on educational interventions to assess their impact on the knowledge, opinions, beliefs, and practices of women with different education levels and ages regarding BC and CC screening, including evaluation of knowledge before and after training. This will allow assessment of the interventions' effectiveness and their potential to change attitudes toward BC and CC screening.

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Appendix 1

1. **Please indicate your education level:** Secondary – Secondary specialized – Higher
2. **How old are you?** (e.g., 29 years)
3. **Has anyone in your family (mother, sister, grandmother) had breast cancer?** Yes/No
4. **Have you been diagnosed with human papillomavirus (HPV)?** Yes/ No/ Not tested

Ukrainian Breast and Cervical Cancer Screening Questionnaire

In this section, a series of statements is provided. Please select the response that best reflects your view. Below, please indicate whether you agree with the following statements.

Statement	Answer
1	**2**
Q1. Treatment prescribed to breast cancer patients can only prolong the period of suffering.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q2. Treatment for cervical cancer patients can only prolong the period of suffering.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q3. Even if breast cancer is diagnosed at early stages, there is a very small chance that the patient will survive.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree

Continuation of Appendix 1

1	2
Q4. Even if cervical cancer is diagnosed at early stages, there is a very small chance that the patient will survive.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q5. Screening for breast and cervical cancer should only be done if there are relevant complaints.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q6. A healthy lifestyle (healthy diet and exercise, avoiding smoking, alcohol, etc.) will help me avoid breast and cervical cancer.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q7. I only see a doctor when I feel sick or have symptoms of illness.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q8. Only women with a family history (among close relatives) of the disease are at risk of getting breast cancer.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q9. Only women with a family history (among close relatives) of the disease are at risk of getting cervical cancer.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q10. I know that screening for early detection of breast and cervical cancer in our country is free.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q11. A cervical smear (Papanicolaou test) will help me detect cervical dysplasia early.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q12. Mammography is the only scientifically proven method for early detection of breast cancer.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q13. Human papillomavirus can cause cervical cancer.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q14. I regularly perform breast self-examination for early detection of breast cancer.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree
Q15. Having a Pap smear is too embarrassing.	1 – Strongly Agree 2 – Agree 3 – Undecided 4 – Disagree 5 – Strongly Disagree

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