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REVIEW ARTICLE

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Knowledge, Attitudes and Practices of Teenagers and Young Adults About Breast Cancer – A Systematic Review

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ABSTRACT

This systematic review seeks to identify studies that examine the level of awareness, attitudes, and practices regarding breast cancer in adolescents and young adults, including their engagement in self-examination. The publications were retrieved from the PUBMED and SCOPUS databases in accordance with the 2020 guidelines for systematic reviews and meta-analyses (PRISMA). The research should be innovative and investigate the understanding and beliefs surrounding self-examination and the prevention of breast cancer among teenagers and young individuals who have not previously been diagnosed with or experienced breast cancer. The publications should be released in the English language between the years 2018 and 2023. According to the criteria outlined in the systematic review, a total of 14 studies were ultimately selected. Out of these, 4 studies focused on students, while the remaining research targeted undergraduate students. Adolescents and young adults had insufficient information of breast cancer prevention and self-examination. Additionally, more than 70% of young individuals expressed a desire to enhance their understanding about breast cancer. The papers emphasize the necessity of creating and executing health promotion initiatives to enhance the understanding and awareness of breast cancer among adolescents and young adults. This is crucial since breast cancer continues to be a significant concern in public health.

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Introduction

Despite advancements in healthcare, breast cancer remains a significant public health issue, being the most prevalent form of cancer among women globally. Recent research indicate that there is a probable increase in the prevalence and mortality rate of the disease in the coming years. The user's text is [1,2]. By 2020, it is projected that there will be approximately 2.3 million new cases of breast cancer among women worldwide, resulting in an estimated 685,000 deaths attributable to the disease [3]. As per the European Union, breast cancer constituted 29% of all malignancies in women and caused 16% of cancer-related deaths among women in the European Union (EU) [4]. The increase in the occurrence of breast cancer among premenopausal women in recent years has led to a focus on studying young women who have been diagnosed with the disease. The reason for this is that the breast cancer subtypes that impact these women are characterized by greater complexity, localized progression in advanced stages, and elevated mortality rates [1,2].

Adolescence is a period characterized by significant physical and psychological changes. Gonadotropin (GnRH) pulse secretion, which facilitates the maturation of estrogen-dependent tissues, is the initial sign of puberty in girls and takes place in the stomach between the ages of 9 and 10 [5].

Approximately 30% of cancer cases in adolescents and young adults are attributed to breast cancer. In addition, this specific demographic is projected to represent 5.6% of all cases of invasive cancer, surpassing the proportion of women over 40. Even with an early diagnosis, there is a 39% higher likelihood of mortality from the disease [6]. The incidence of breast cancer among young adults in the European Union was projected to be 25 cases per 100,000 individuals in 2020 [7]. Estimates indicate that there are approximately 30 to 40 new cases of breast cancer in male adolescents and young adults in the United States each year. These cases account for 2.6% of all breast cancer cases in this age group. The user's text is [8].

Some individuals may experience the onset of breast cancer at a younger age as a result of specific risk factors. Trama et al, identified several factors that include breastfeeding, age of menstruation onset, age of first pregnancy, low body mass index (BMI<20), alcohol consumption, sedentary lifestyle, and family history [7].

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Research has indicated that starting from 1990, there has been an increase in the rates of patients surviving breast cancer, and there have been efforts to introduce programs for early identification. This emphasizes the crucial importance of prevention in the treatment of breast cancer [3]. Che Mut et al, state that the timely identification of breast cancer enhances the outlook for the disease [9]. Insufficient levels of knowledge and teaching regarding illness prevention can lead to delays in disease diagnosis. It is crucial to comprehend the importance of acquiring knowledge about breast health, as it will facilitate the early detection of the problem [9].

Wang Y.J.'s research found that 84% of the studies included in their systematic review included information concerning the high morbidity of breast cancer. However, these studies lacked knowledge about the risk factors and symptoms of the disease. Specifically, 40% of the participants demonstrated knowledge of the symptoms associated with the disease, while 51% of the individuals exhibited awareness of the risk factors. According to Wang et al, the study estimates that a total of 53% of participants have knowledge of the disorder [10].

The development of healthy habits in adulthood may be influenced by psychological changes that occur during adolescence [11]. Therefore, providing education to young people about breast cancer prevention may promote the utilization of breast clinical evaluations, self-examinations, and future mammography and ultrasound breast screenings [12].

Aim

The objective of this systematic review was to identify studies that would accurately reflect the knowledge and attitudes of young adults and adolescents regarding breast cancer prevention. The following study questions were formulated based on the PICO (Population, Intervention, Comparison, and Outcome) framework [13].

[1] What is the level of awareness among adolescents and young adults regarding breast cancer and self-examination?

[2] What are the attitudes and behaviors of teenagers and young adults towards breast cancer prevention?

[3] What is the level of awareness among men regarding breast cancer?

[4] Do teenagers and young adults engage in breast self-examinations?

[5] Is it necessary to provide education to teenagers and young adults regarding the proper technique for breast self-examination?

[6] Is it necessary to introduce health promotion programs specifically targeting teenagers and young adults in order to enhance their understanding and attitudes towards breast cancer?

Methods

Search Strategies

This systematic review was conducted using the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA) [14]. The papers were retrieved from the electronic databases PubMed and Scopus during two separate time periods: March 1–13, 2023 and January 10–22, 2024.

Searches were performed using the following query for PubMed: (("breast cancer" [tw] OR "breast neoplasms*" [tw]) AND ("risk assessment" OR "breast cancer screening" [tw] OR "breast self-examination" [tw] OR "breast health" [tw])) AND (awareness [tw] OR attitude*[tw] OR perception*[tw] OR knowledge*[tw] OR practice* [tw] OR behavior* [tw] OR "health believe*" [tw] OR program* [tw] OR education [tw]) AND (adolescent* [tw] OR "young adult*" [tw] OR student*[tw]) and for Scopus: TITLE-ABS-KEY ("breast cancer" OR "breast neoplasms*") AND ("risk assessment" OR "breast cancer screening" OR "breast self-examination" OR "breast health") AND (awareness OR attitude* OR perception* OR knowledge* OR practice* OR behavior* OR "health believe*" OR program* OR education) AND (adolescent* OR "young adult*" OR student*). The keywords used were checked through the Mesh Term.

Selection Criteria

This systematic review included articles published in English between 2018 and 2023 that were freely accessible and not part of systematic reviews, meta-analyses, or the grey literature. In order to be eligible for inclusion in the age categories examined in this systematic review, individuals must fall within the age range of 10 to 26 years. The researchers aim to demonstrate the participants' knowledge, attitudes, and actions regarding breast cancer prevention without any form of intervention. Furthermore, the focus of the research should be on adolescents and young individuals who have not undergone any assessment from their parents or educational institutions. Moreover, the participants should be in a state of good health, indicating that they should not be currently ill or have a history of cancer.

Study Selection, Characteristics and Quality

The search produced a combined total of 3297 articles from both databases, with 297 originating from PubMed and the rest 3000 from Scopus. A total of 592 items, identified as duplicates, were eliminated, leaving 2705 articles for further verification. Upon reviewing the headings and summaries, a total of 2249 articles were deemed useless and subsequently removed. This left us with 456 articles, out of which 23 were eliminated due to the unavailability of free access to the complete text. Out of the remaining 433 articles, 419 were not accepted due to the following reasons: 322 articles had participants who did not meet the age criteria, 57 articles focused on survivors or cancer patients, 10 articles included other types of cancer, 37 articles were not published in English, 9 articles conducted interventions at the same time as the knowledge and attitude check, and 2 articles included the knowledge of parents. Ultimately, there were 14 articles left, as depicted in Figure 1.

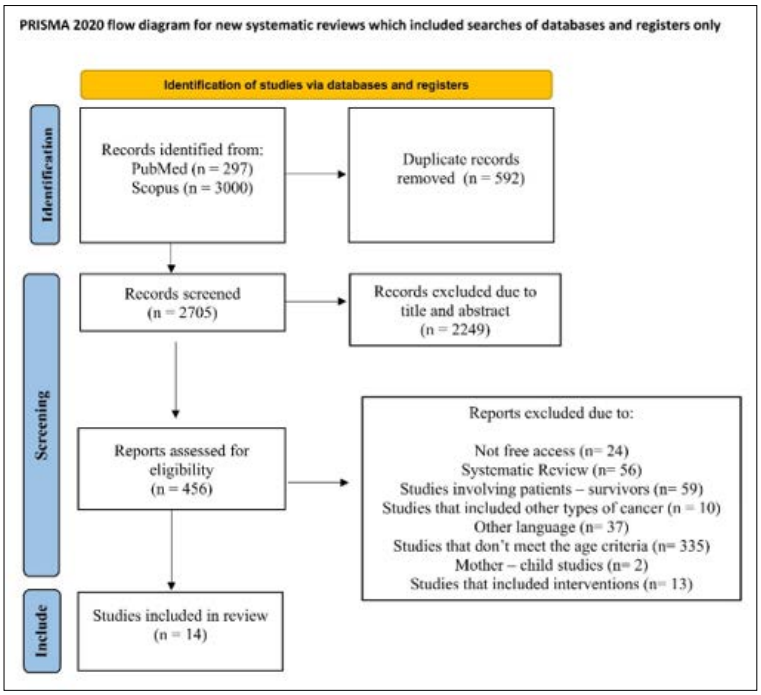

Figure 1: Flow Diagram Summarizing the Article Screening Process

Results

Table 1: Characteristics of the Included Studies

Article Title (Chronology)	Authors	Reference Population	Study Population	Type of Study	Tools	Results
Teenagers						
Breast cancer education for schoolgirls: an exploratory study (2018) [15].	Brown N., Smith J., Brasher A., Omrani A., Wakefield-Scurr J.	Schoolgirls, England	Teenage students aged 11 – 18.	Cross-sectional Study	Use a questionnaire to collect data.	Nearly half (44%) of female students reported being concerned about breast cancer, with 72% saying they would like to know more about this topic.
Breast education for schoolgirls; why, what, when, and how? (2018) [16].	Brown N., Smith J., Brasher A., Risius D, Marczyk A., Wakefield – Scurr J.	Schoolgirls, England	Students 11 – 18 years old	Cross-sectional Study	Conducting a study with a questionnaire of 6 modules.	87% of schoolgirls report at least one breast concern, with the usual one being "how to check for breast cancer" (44%). 72% reported wanting to know how to check for breast cancer with 67% rating it as extremely important.

Perceptions of Adolescents Regarding Breast Cancer (2021) [17].	Amatya I., Vaidya A., Regmi P.R.	Teenagers in Nepal	Pupils aged 15 – 21	Cross-sectional Study	The study was conducted using a questionnaire with 4 sections	19.3% had heard of breast self-examination. 53.9% knew in which age group it should start, 43.7% of men and 43.4% of women knew it should be done monthly. 64.4% agreed that most women do not know the appropriate way to examine the breast and 44.3% are hesitant or ashamed about breast examination.
Female high school students' knowledge and attitude toward breast cancer (2023) [18].	Mohebi Z., Sarvestani M.H., Moradi Z., Naghizadesh M.M.	Schoolgirls in Iran	Female students in Fasa with an average age of 17.46 years	Cross-sectional Study	Use of a 2-section questionnaire. Cronbach alpha= 0.67 and contentment validity index (CVI) = 0.94	The level of knowledge about breast cancer was assessed low (63.98%) as well as breast self-examination (50.48%). 63.3% were not aware of screening methods for detecting breast cancer such as clinical examination and mammography and 70% were not informed or trained about breast self-examination.
Young Adults						
Breast self-examination awareness and practices in young women in developing countries: A survey of female students in Karachi, Pakistan (2018) [19].	Ahmed A., Zahid I., Ladiwala Z.F.R, Sheikh R., Memon A.S.	Students in Pakistan	Students from universities in Karachi, Pakistan	Cross-sectional study	A research questionnaire was developed as a data collection tool. It consisted of 38 questions and was divided into four sections.	68.4% recognized that breast self-examination is an important tool for early detection of breast cancer. The main reason why more than half of the population had not done a breast self-exam was simply because they did not know how to perform it (52.1%)

Female university students' knowledge and practice of breast self-examination in Turkey (2019) [20].	Koc G., Gulen-Savas H., Ergol S., Yildirim-Cetinkaya M., Aydin N.	Female Students, Turkey	Female students from a public university in Turkey's western Black Sea region	Cross-sectional study	The data questionnaire consists of three parts and 51 questions (11 open-ended, 40 multiple-choice)	73.3% had heard of breast self-examination. 50.9% did not know when to do the breast self-examination and 55.9% stated that they should consult a doctor whenever thickening or swelling is detected during the self-examination.
Assessment of breast self-examination practice and its associated factors among female undergraduate students in Addis Ababa University, Addis Ababa, Ethiopia, 2016 (2019) [21].	Getu M.A., Kassaw M.W., Tlaye K.G., Gebrekiristos A.F.	Students in Ethiopia	Undergraduate students from Addis Ababa University, College of Business and Economics	Cross-sectional study	The data was collected using a five-part questionnaire.	10.5% of study participants perform a breast self-examination at the right time, that is, 2-3 days after menstruation 29.7% said they did not know how to perform a breast self-examination.
Breast Cancer knowledge and perceived barriers to help seeking among pre-clinical and clinical female medical students of King Edward Medical University, Lahore: a cross-sectional study (2020) [22].	Qasim S., Tayyab H., Zulqadar K., Masood S., Qasim T.B., Zubair Z.	Medical Students, Pakistan	Medical students from King Edward Medical University, Lahore, ages 18 – 21	Cross-sectional Study	Using a questionnaire to collect data	The barriers had a significant statistical difference between preclinical and clinical students: not feeling confident talking about the symptom with the doctor ($p = 0.039$) and fear of worrying about what the doctor might find ($p = 0.050$).
Breast cancer awareness among pharmacy and physiotherapy students of medical university Nawabshah (2021) [23].	Irfan R., Memon H., Umrani I.N., Soomro H.	Students in Pakistan	Students from the university's Institute of Pharmaceutical Sciences and the Institute of Physiotherapy and Rehabilitation Sciences in Nawabshah.	Cross-sectional study	The data was collected using a questionnaire that investigated 6 areas	82.13% of participants had knowledge about breast self-examination 88.53% agreed that breast self-examination is an important tool for early diagnosis of breast cancer symptoms.

Breast Self-Examination Knowledge and its Determinants among Female Students at Addis Ababa University, Ethiopia: An Institution-Based Cross-Sectional Study (2022) [24].	Getu M.A, Abebe M., Tlaye K.G, Goshu A.T.	Female students Ethiopia	Students from the College of Business and Economics of Addis Ababa University in Ethiopia from 1 to 30 February 2016.	Cross-sectional study	Data collection with a 5-module questionnaire. Cronbach alpha= greater than 0,70. CVI = 0,83 - 1	49.9% had good knowledge of breast self-examination. About 56% of participants reported that they did not know how often breast self-examination should be done. 52.6% knew that self-examination allows the detection of atypical changes in the size and shape of breasts.
Knowledge of breast cancer and breast self-examination practices and its barriers among university female students in Bangladesh: Findings from a cross-sectional study (2022) [25].	Sarker R., Islam S., Moonajilin S., Rahman M., Gesesew H.A., Ward P.R.	Students, Bangladesh	Undergraduate and postgraduate students of Jahangirnagar University	Cross-sectional study	Data collection through questionnaires.	33.3% of participants saw "lack of knowledge" as the main barrier to practicing breast self-examination, followed by "I don't have the symptoms" (21.8%), "shyness/ uncomfortable feelings" (16.5%), "I don't think it's important (9.5%), "I know I'll never have breast cancer" (6.8%) and "fear or diagnosis of cancer" (6.3%).
Assessment of Breast Cancer Awareness Among Female Students in an Egyptian University (2022) [26].	Abdelwahab K., Metwally I.H., Hamdy O., Ibrahim N., El-Harery A., Elbalka S.S.	Students, Egypt	Students from Mansoura University, Egypt.	Cross-sectional study	Data collection through a questionnaire	None of the students had a breast self-exam and when asked, the majority (27.1%) had no specific problem preventing them from exercising.
Perceptions and knowledge of breast cancer and breast self-examination among young adult women in southwest Ethiopia: Application of the health belief model (2022) [27].	Mossa K.A.	Young women, southwestern Ethiopia	Women 20 – 24 years old	Cross-sectional Study	Data collection with a questionnaire divided into 4 sections. Cronbach's alpha reliability coefficient ranged from 0.58 to 0.91	50.13% had heard of breast self-examination before. 79.89% of respondents had incomplete knowledge about him. 71.05% have no idea how to self-test.

Prediction of Breast Self – Examination Behavior among Omani undergraduate students using Champion's Health Belief Model (2023) [28].	Shakhman L.M., Arulappan J.	Students in Oman	Students of Sultan Qaboas University, Oman, ages 18 – 25	Students of Sultan Qaboas University, Oman, ages 18 – 25	Using a Champion's Health Belief Model Scale questionnaire Cronbach's alpha reliability factor ranged from 0.75 to 0.93	Knowledge about breast self-examination is judged to be mediocre overall. 87.9% had heard of self-examination and 36.7% had carried out.

Table 1 demonstrates that the research carried out by Amatya et al, Irfan et al, and Abdelwahab et al, produced the most remarkable results [17,23,26]. The study conducted by Amatya et al, is the only one that included both males and females [17]. Data was collected from 990 students, aged 15 to 21, using a questionnaire consisting of four modules. The male participants constituted 45.66% of the total, whereas the female participants constituted 54.34%. Merely 19.3% of participants were aware of breast self-examination, whereas the majority of respondents (89.6% of men and 88.5% of women) possessed inadequate knowledge regarding breast cancer in general. Male respondents exhibited a lower likelihood of having a positive attitude towards breast cancer compared to female respondents [Adjusted Odds Ratio (AOR): 0.58; 95% Confidence Interval (CI): 0.45-0.76]. This association was statistically significant with a p-value of less than 0.05. The analysis of participants in the study conducted by Irfan et al, revealed a modest level of awareness on breast cancer [23]. The study involved 450 female students, aged 18 to 26, who participated by completing a comprehensive questionnaire consisting of six modules. The data indicate that 82.13% of the participants were knowledgeable with breast self-examination, and 88.53% of them agreed that it is an essential method for detecting early signs of breast cancer. However, there was minimal evidence indicating a correlation between the practice of breast self-examination and knowledge. Ultimately, the research carried out by Abdelwahab et al, was the study that determined the participants' understanding to be satisfactory [26]. The study involved the participation of 431 female students, and data was collected by a questionnaire consisting of 35 questions. The results indicated that none of the students engaged in breast self-examination. When asked about their reasons, the majority (27.1%) stated that they did not have any specific obstacles preventing them from doing so. In relation to the prevention of breast cancer, around 31.1% of respondents highlighted several factors, such as avoiding exposure to radiation, maintaining a nutritious diet, undergoing regular medical check-ups (14.8%), and performing self-examinations of the breasts (8.6%). These were listed in descending order of prevalence. Two characteristics of the study include the utilization of an Arabic questionnaire to enhance understanding and the incorporation of both closed-ended and open-ended questions to promote comprehensive responses. Moreover, the comparison among medical students is deemed viable as it yielded numerous insightful discoveries

Discussion

Out of the 14 conducted research, 10 of them focused on students aged 19-28, while the remaining 4 studies examined students aged 15-18. Out of the participants, 13 studies focused on femininities, whereas 1 study examined both femininities and masculinities [15-28]. The study was conducted in several countries, including eight in Asia (Bangladesh, Nepal, Iran, Pakistan, Oman, Turkey), four in Africa (Ethiopia, Egypt) and two in Europe (United Kingdom) [15-28]. In addition, with regards to the research objectives, it was observed that five studies evaluated knowledge, attitudes, and practices related to breast self-examination two studies examined the importance of breast-related education two studies explored knowledge about breast cancer without specifically focusing on self-examination but rather on general knowledge about the condition and five studies assessed knowledge, attitudes, and practices related to disease prevention [15-28]. Finally, out of the total of 14 investigations, only 4 of them utilized Cronbach's alpha reliability index, while an additional 2 studies employed the CVI index to assess the validity of the material [18,24,27,28]. Due to the Shakhman et al, study's credibility index being calculated with a value near to one, it can be considered the most reliable questionnaire [28]. A questionnaire is considered acceptable if it has a reliability index value greater than 0.7. The closer the questionnaire's value is to 1, the more trustworthy it is considered to be [29].

School Population

A study examining participants' awareness of breast cancer indicated a significant lack of understanding. In terms of risk factors, the initial findings of the Mohebi et al, study indicated that only 18.3% of participants were aware of the risk of developing the disease if they had a positive family history [18]. In contrast, the Amatya et al, study found that over 50% of participants were unaware that having a family history was a risk factor for the disease. Additionally, as reported by 35% of participants in the study conducted by Mohebi et al, breast cancer exclusively impacts women [18]. An encouraging advancement in the management of breast cancer is that about 70% of participants in the Amatya et al, study were cognizant of the possibility of controlling the disease [17]. By contrast, the study conducted by Mohebi et al, found that 60.1% of participants were not aware of the significance of mammography in detecting diseases at an early stage, and 84.6% of participants were uninformed of the recommended age to start getting mammograms [18]. By comparison, the study conducted by Amatya et al, found that 71.1% of participants were knowledgeable about the recommended age for the first mammogram, suggesting a higher level of awareness. In the study conducted by Mohebi et al, it was found that 91% of the participants lacked the ability to do a clinical examination of the breasts [17,18]. On the other hand, the study by Amatya et al, revealed that 41.2% of the participants were knowledgeable about the proper execution of

the examination [17]. Regarding the age at which the sickness first appeared, participants in the research conducted by Amatya et al, and Mohebi et al, perceived that women above the age of 40 were more susceptible to the condition, rather than those who were younger (40% and 67.8%, respectively) [18].

Furthermore, the research findings reveal a deficient degree of comprehension and implementation about breast self-examination. In the study conducted by Amatya et al, approximately 54% of participants demonstrated awareness of the appropriate timing to initiate breast self-examinations, while roughly 45% were knowledgeable of the recommended frequency of once a month [17]. In the study conducted by Mohebi et al, it was shown that 63.3% of participants were unaware of the fact that breast self-examination is a method for early detection of breast cancer. Additionally, 83% and 77.9% of participants did not have knowledge regarding the appropriate age to start doing breast self-examinations or the recommended frequency of such examinations [18]. In the study conducted by Amatya et al, 44.3% of participants expressed feelings of embarrassment or hesitation towards performing breast self-examination [17]. Conversely, in the study conducted by Mohebi et al, 13.2% of participants held the belief that if one leads a stress-free life, there is no obligation to perform breast self-examination [18].

The study conducted by Risius et al, revealed that 87% of the participants expressed concerns regarding their breasts, and 44% of them specifically expressed curiosity about the proper method for detecting early indicators of breast disease [16]. In addition, 72% of the participants expressed a desire to acquire further knowledge about self-examination, while 67% considered it to be a highly significant matter. Based on the findings of the study conducted by Brown et al, approximately 44% of the participants expressed worry about the condition, 72% expressed a desire to acquire more knowledge about it, and 40% emphasized the importance of having access to information [15]. In the study conducted by Amatya et al, it was found that approximately 67% of participants expressed the necessity for breast cancer awareness programs within school communities [17]. According to the Risius et al, study, most participants agreed that the age of eleven, which is when women usually start experiencing breast growth, is the appropriate time to start educating about breast health [16]. When it comes to training, participants have a preference for female teachers and learning methods that are fun.

Young Adults

The majority of research projects that focused on young adults, particularly students, reached the consensus that there was insufficient knowledge about this specific group. Conversely, one study evaluated the knowledge as average, while another study ranked it as satisfactory [23,26]. The research conducted by Irfan et al, demonstrates the highest levels of awareness of age and the use of contraceptive pills as risk factors for breast cancer, with rates of 60% and 88% respectively [23]. This study appears to have gathered the highest rates for these two criteria. The study conducted by Qusim et al, exhibits the most minimal rates [22]. Only 7.9% of interviewees admit that age poses a risk. However, it appears that the use of birth control tablets was identified as a risk factor. In the Mossa experiment, this percentage was 31.4%, while in the Abdelmahab et al, investigation, participants recognized this as a risk factor at 33.7% and 57.5%, respectively [26,27]. In addition, Abdelmahab et al, found that the majority of participants (86.5%) identified family history as a risk factor, while Mossa's study reported the lowest percentage (29.8%) [26,27]. However, a mere 19.3% of individuals in the Mossa study recognized early menstruation as an additional noteworthy characteristic [27]. The study conducted by Irfan et al, gathered the highest levels of awareness on symptoms that are indicative of breast cancer [23]. Specifically, 64.8% of the people exhibited the secretion of blood or other fluids from their nipples, 90.9% experienced chest pain, and 93.7% presented with tumors. The subsequent investigation revealed reduced levels of understanding regarding symptoms. Only 42.8% of the participants in the Sarker et al, study correctly recognized a breast tumor as an indication of breast cancer [25]. The research conducted by Abdelmahab et al, reports the lowest incidence rate (56.8%) for chest discomfort. The media, including radio and television, is widely recognized as the primary source of information on breast cancer [26]. The study conducted by Abdelmahab et al, revealed that the least prevalent features accounted for only 3.5%. The user's text is [26]. Health experts provided more information, although they only referred to two of the research. In the study conducted by Mossa and Sarker et al, health professionals were recognized as a source of information at a rate of 16% and 28.6%, respectively. The research conducted by Abdelmahab et al, reveals an interesting discovery regarding information sources [26]. Specifically, 33.8% of the participants reported acquiring knowledge about breast cancer from several sources, as opposed to relying on a single source.

None of the other studies that evaluate the sources of information used by participants mention this fascinating discovery. Based on the research, there is a scarcity of information regarding breast self-examination. The study conducted by Koc et al, reported the lowest participant rate at 50.9%, whilst the study conducted by Getu et al, identified the highest number of participants at 64.2% who were uncertain about the specific timing for conducting breast self-examinations [20,24]. Overall, research on participants' awareness of the timing for self-examination has shown a lack of information. In addition to the previously mentioned studies, 58.7% of participants in the Mossa study and 54.6% of participants in the Ahmed et al, study were unaware of the appropriate time [19,27]. The inclusion criteria for several research studies required participants to have received instruction from a healthcare expert on how to do the self-examination. Consequently, the study conducted by Getu et al, revealed that 31.9% of participants performed self-examinations based on the recommendation of their doctors [21]. In the study conducted by Abdelmahab et al, the majority of participants (72.4%) expressed their willingness to seek medical assistance when questioned about their inclination to consult a healthcare professional following any alterations in their chest [26]. Moreover, a significant majority of 63.8% of participants in the study conducted by Ahmed et al, expressed their willingness to seek advice from an expert in the event of observing any alterations in their breasts. The Qasim et al, study provides reasons why participants would refrain from seeking medical assistance [19,22]. Factors such as shame (49.4%), fear (37.9%), knowledge of the symptoms (43.9%), excessive workload with other difficulties (58%), and the presence of additional concerns (50%) contribute to these circumstances. Some research participants highlighted the importance of identifying something

at an early stage. In the study conducted by Getu et al, [21], 69.5% of participants expressed the belief that early detection improves the chances of survival. Similarly, in the studies by Ahmed et al, (68.4%), Getu et al. (29.7%), and Koc et al, (83.1%), self-examination was highlighted as a method for early detection. The notable findings from the studies conducted by Qasim et al, and Abdelmahab et al, indicate that in the first study, participants were able to detect breast changes at a rate of 8.6%, whereas in the second study, none of the participants had performed a self-examination of their breast [19-22]. In contrast, Shakhman et al, found that participants were able to detect changes in their breasts at a rate of 37.5%. Additionally, 44.6% of participants reported feeling an improvement in their self-esteem after doing breast self-examinations. In Mossa's study, the most prevalent reasons for not undertaking self-examination were lack of information (71.05%) and absence of perceived hazard of developing breast cancer (97.6%). The study conducted by Abdelmahab et al, reported the lowest rates, which were 12.5% and 3.5% for the two reasons mentioned [26-28]. Another factor contributing to this phenomenon is the prevalence of feelings of guilt associated with their breasts, as highlighted in the research conducted by Getu et al, with a significant proportion of participants (34.9%). In the study conducted by Ahmed et al, a unique aspect is explored about the discussion of breast self-examination among friends [19-21]. Therefore, 37.9% of individuals engage in discussions with their friends regarding breast self-examination.

Conclusion

There is a growing demand for the establishment of health care and promotion initiatives targeting the prevention of breast cancer in adolescents and young adults. These programs aim to diagnose the disease early and reduce mortality rates. In both Greece and the rest of Europe, there was a noticeable deficiency in the execution of research aimed at examining the knowledge and attitudes of the younger generation. Additionally, it is imperative to examine the knowledge and attitudes of young males, as this area has been overlooked in the current body of research.

The analysis of the 14 papers has brought attention to certain concerns that the scientific community should address in the future. Specifically, extensive research indicates the necessity of developing and executing further awareness campaigns that include individuals of all genders. This is crucial for enhancing understanding of breast cancer and promoting self-examination practices. Prior research has emphasized the necessity of developing messages that may be endorsed by the media to enhance public knowledge regarding breast cancer [24,21]. Additionally, it is recommended to conduct additional research in order to comprehend the correlations between socio-economic status, income, parental/caregiver education, and place of residence with the knowledge and attitudes of young individuals regarding breast cancer and self-examination [22]. These researchers will make valuable contributions to the creation of health interventions and programs that address the population's needs and enhance disease survival rates in the community, thereby making a significant contribution to public health.

Declaration

Conflicts of interest

The authors assert that they have no conflicts of interest related to this article. This study did not get any financial assistance.

References

[1] Anastasiadi Z, Lianos GD, Ignatiadou E, Harissis H V, Mitsis M. Breast cancer in young women: an overview. Updates Surg. 2017; 69: 313-317.

[2] Ntekim A, Oluwasanu M, Odukoya O. Breast Cancer in Adolescents and Young Adults Less Than 40 Years of Age in Nigeria: A Retrospective Analysis. Int J Breast Cancer. 2022; 2022: 9943247.

[3] Breast Cancer. In: World Health Organization. Available via. https://www.who.int/news-room/fact-sheets/detail/breast-cancer.

[4] Dafni O, Tsourti Z, Alatsathianos I. Breast Cancer Statistics in the European Union: Incidence and Survival across European Countries. Breast Care (Basel). 2019; 14: 344-353.

[5] Χανιώτης Φ, Χανιώτης Δ. Ενδοκρινείς Αδένες – Ενδοκρινικό Σύστημα. In: Φυσιολογία (ed) Ιατρικές Εκδόσεις ΛΙΤΣΑΣ, Αθήνα. 2015; 409-494.

[6] Cathcart-Rake E, Ruddy KJ, Bleyer A, Johnson RH. Breast Cancer in Adolescent and Young Adult Women Under the Age of 40 Years. JCO Oncol Pract. 2021; 17: 305-313.

[7] Trama A, Stark D, Bozovic-Spasojevic I, Gaspar N, Peccatori F, et al. Cancer burden in adolescents and young adults in Europe. ESMO Open. 2023; 8: 100744.

[8] Johnson RH, Anders CK, Litton JK, Ruddy KJ, Bleyer A. Breast cancer in adolescents and young adults. Pediatr Blood Cancer. 2018; 65: e27397.

[9] Mut NAIC, Bakar NHA, Kamal I, Suhaimi SAA, Mohammad NM, et al. Knowledge and Awareness of Breast Self-Examination among Secondary School Girls in Seremban, Negeri Sembilan. Asian Pac J Cancer Care. 2019; 4: 1-4.

[10] Wang YJ, Wang F, Yu LX, Xiang YJ, Zhou F, et al. Worldwide review with meta-analysis of women's awareness about breast cancer. Patient Education and Counseling. 2022; 105: 1818-1827.

[11] Almutairi AH, Tamrin SBBM, Wirza R, Ahmad NB. Systematic Review on Knowledge and Awareness of Breast Cancer and Risk Factors Among Young Women. Advances in Bioscience and Clinical Medicine. 2019; 7: 1.

[12] Lawal O, Murphy F, Hogg P, Nightingale J. Health Behavioural Theories and Their Application to Women's Participation in Mammography Screening. J Med Imaging Radiat Sci. 2017; 48: 122-127.

[13] Eriksen MB, Frandsen TF. The impact of patient, intervention, comparison, outcome (PICO) as a search strategy tool on literature search quality: a systematic review. J Med Libr Assoc. 2018; 106: 420-431.

[14] Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021; 372: n71.

[15] Brown N, Smith J, Brasher A, Omrani A, Wakefield-Scurr J. Breast cancer education for schoolgirls: An exploratory study. European Journal of Cancer Prevention. 2018; 27: 443-448.

[16] Brown N, Smith J, Brasher A, Risius D, Marczyk A, et al. Breast education for schoolgirls; why, what, when, and how? Breast

Journal. 2018; 24: 377-382.

[17] Amatya I, Vaidya A, Regmi PR. Perceptions of Adolescents Regarding Breast Cancer. J Nepal Health Res Counc. 2021; 19: 331-336.

[18] Mohebi Z, Sarvestani MH, Moradi Z, Naghizadesh MM. Female high school students' knowledge and attitude toward breast cancer. BMC Women's Health. 2023; 23: 1-41.

[19] Ahmed A, Zahid I, Ladiwala ZF, Sheikh R, Memon A. Breast self-examination awareness and practices in young women in developing countries: A survey of female students in Karachi, Pakistan. J Educ Health Promot. 2018; 7: 1-90.

[20] Koc G, Gulen-Savas H, Ergol S, Yildirim-Cetinkaya M, Aydin N. Female university students' knowledge and practice of breast self-examination in Turkey. Niger J Clin Pract. 2019; 22: 410-415.

[21] Getu MA, Kassaw MW, Tlaye KG, Gebrekiristos AF. Assessment of breast self-examination practice and its associated factors among female undergraduate students in Addis Ababa university, Addis Ababa, Ethiopia, 2016. Breast Cancer: Targets and Therapy. 2019; 11: 21-28.

[22] Qasim S, Tayyab H, Zulqadar K, Masood S, Qasim TB, et al. Breast Cancer knowledge and perceived barriers to help seeking among pre-clinical and clinical female medical students of King Edward Medical University, Lahore: A cross-sectional study. BMC Med Educ. 2020; 20: 222.

[23] Irfan R, Memon H, Umrani IN, Soomro H. Breast cancer awareness among pharmacy and physiotherapy students of medical university Nawabshah. J Pak Med Assoc. 2021; 71: 297-301.

[24] Getu MA, Abebe M, Tlaye KG, Goshu AT. Breast Self-Examination Knowledge and its Determinants among Female Students at Addis Ababa University, Ethiopia: An Institution-Based Cross-Sectional Study. Biomed Res Int. 2022; 2022: 2870419.

[25] Sarker R, Islam MS, Moonajilin S, Rahman M, Gesesew HA, et al. Knowledge of breast cancer and breast self-examination practices and its barriers among university female students in Bangladesh: Findings from a cross-sectional study. PLoS One. 2022; 17: e0270417.

[26] Abdelwahab K, Metwally IH, Hamdy O, Ibrahim N, El-Harery A,et al. Assessment of Breast Cancer Awareness Among Female Students in an Egyptian University. Indian J Gynecol Oncol. 2022; 6: 154.

[27] Mossa KA. Perceptions and knowledge of breast cancer and breast self-examination among young adult women in southwest Ethiopia: Application of the health belief model. PLoS One. 2022; 17: e0274935.

[28] Shakhman LMW, Arulappan J. Prediction of Breast Self-Examination Behavior Among Omani Undergraduate Students Using Champion's Health Belief Model. SAGE Open Nurs. 2023; 9: 23779608231179531.

[29] 29. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011; 2: 53-55.