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BREAST CANCER AND BREAST SELF-EXAMINATION AWARENESS AMONG FEMALES OF REPRODUCTIVE AGE

Original Research

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ABSTRACT

Background: Breast cancer remains the most prevalent malignancy among women worldwide and is a leading cause of cancer-related mortality. Early detection significantly improves prognosis and survival rates. Despite advancements in screening techniques, awareness and practice of preventive methods, such as Breast Self-Examination (BSE), remain insufficient, particularly among women of reproductive age. Identifying knowledge gaps regarding breast cancer risk factors, warning signs, and BSE is essential for developing effective public health interventions.

Objective: This study aimed to assess the knowledge of breast cancer, awareness of BSE, and the evaluation of BSE practices among females aged 15 to 49 years.

Methods: A descriptive cross-sectional study was conducted using convenience sampling, including 254 female participants aged 15 to 49 years. Data were collected through an online questionnaire distributed via Google Forms from July to September 2024. The questionnaire covered sociodemographic information, knowledge of breast cancer risk factors and warning signs, and the practice of BSE. Data analysis was performed using IBM SPSS Version 27, with chi-square tests applied to assess associations between variables.

Results: Among the participants, 75.2% were MBBS/BDS students, 12.6% were postgraduates, and 7.1% held bachelor's degrees. While 60.6% of participants demonstrated knowledge of warning signs and symptoms, only 32.3% were aware of breast cancer risk factors. A family history of breast cancer (87.4%) was the most recognized risk factor, while the presence of a breast lump or swelling (84.3%) was the most commonly identified symptom. A significant association was observed between educational status and awareness of both risk factors ($P=0.016$) and warning signs ($P<0.001$). However, only 28% of participants reported regularly performing BSE, with 72% admitting they had never practiced it.

Conclusion: Although general awareness of breast cancer was high, knowledge of risk factors and the practice of BSE were notably deficient, particularly among non-medical participants. This highlights the need for targeted educational interventions to improve breast cancer awareness and encourage routine BSE practice among women of reproductive age.

Keywords: Awareness, Breast Cancer, Breast Self-Examination, Early Detection, Knowledge, Risk Factors, Reproductive Age.

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INTRODUCTION

Breast cancer remains the most prevalent malignancy and a leading cause of mortality among women globally. While traditionally associated with middle-aged females, recent epidemiological data from Pakistan reveal a concerning rise in breast cancer cases among younger women (1). This growing incidence highlights the urgent need for heightened awareness, particularly among females of reproductive age who often lack sufficient knowledge of breast cancer risk factors, early warning signs, and screening methods (2). Early recognition of symptoms plays a pivotal role in improving survival rates, as timely detection can significantly enhance treatment outcomes. In Pakistan, the alarming statistic that one in every nine women will be diagnosed with breast cancer underscores the importance of targeted public health interventions aimed at fostering greater awareness and promoting early detection practices (3). The early identification of breast cancer hinges not only on advancements in diagnostic technology but also on the widespread adoption of preventive measures such as Breast Self-Examination (BSE). BSE is a simple, cost-effective, and non-invasive screening technique that empowers women to regularly assess their own breasts for abnormalities, including lumps, swelling, changes in breast contour, skin alterations, or unusual nipple discharge (4). This practice, ideally initiated in the late teenage years, enables women to become familiar with their breast tissue and recognize potential warning signs promptly (5). Despite its simplicity and accessibility, the practice of BSE remains relatively uncommon, particularly among women with lower educational backgrounds. Research has predominantly focused on more educated populations, such as healthcare professionals, university students, and teachers, leaving a gap in understanding its adoption among the broader population (6,7).

In resource-constrained settings, where access to advanced screening tools like mammography may be limited, physical examination methods such as BSE and Clinical Breast Examination (CBE) by trained professionals remain vital strategies for early detection (8). BSE, in particular, serves as a valuable tool for raising awareness and facilitating early recognition of abnormalities, thus promoting timely medical intervention in communities where large-scale screening programs are often unfeasible (9). However, psychological barriers, including fear of discovering a potential malignancy or anxiety about false-positive findings, frequently deter women from performing regular BSE, especially among younger individuals who may perceive themselves as being at lower risk (10). Given these challenges, this study hypothesizes that women with higher educational attainment exhibit greater awareness and practice of BSE compared to those with lower education levels. In light of the increasing burden of breast cancer among younger women in Pakistan, this research aims to evaluate the level of awareness and understanding of BSE and its role in facilitating early detection and diagnosis among females of reproductive age. By identifying gaps in knowledge and practice, the study seeks to inform future public health initiatives designed to empower women with the necessary tools to recognize early signs of breast cancer and seek timely medical care.

METHODS

This study employed a descriptive, cross-sectional research design to evaluate the knowledge of breast cancer, including its risk factors and warning signs, as well as the awareness and practice of Breast Self-Examination (BSE) among females of reproductive age. The research aimed to explore the relationship between the level of knowledge and the actual practice of BSE within this population. The central research question focused on assessing the extent of awareness regarding breast cancer and BSE among women aged 15 to 49 years. Participants were selected based on defined inclusion and exclusion criteria. Females aged between 15 and 49 years from diverse educational backgrounds—including those with Matric/O-levels, FSC/FA/A-levels, MBBS/BDS degrees, bachelor's degrees, and postgraduate qualifications—were considered eligible. The study also included women from various occupational settings such as students, employees, and housewives. Exclusion criteria ruled out males, females younger than 15 or older than 49 years, and individuals with primary education or below matriculation level, as these groups fell outside the target demographic for the study's objectives.

The sample size was determined using the Raosoft Sample Size Calculator, which recommended 380 participants to achieve statistically significant results. However, due to logistical constraints and limited resources, data were collected from 254 respondents using a convenience sampling method. The data collection process was conducted through an online questionnaire distributed via Google Forms between July 2024 and September 2024. Participation in the study was entirely voluntary, and informed consent was obtained electronically from all participants before they completed the questionnaire. The study ensured confidentiality, with assurances that all data would be used solely for research purposes. Ethical approval was sought from the relevant Institutional Review Board (IRB)

adhering to ethical research guidelines. The questionnaire used for data collection was adapted from validated tools based on previous research conducted at the University of Sharjah (REF) and Malaysia (REF), ensuring both validity and reliability. It consisted of multiple sections. The first section gathered sociodemographic information, including age, marital status, and educational background. The second section evaluated knowledge regarding breast cancer, focusing on risk factors, family history, personal history, and warning signs. Participants were presented with 14 questions assessing their understanding of breast cancer risk factors; those who answered seven or more questions correctly were categorized as knowledgeable, while those with fewer correct responses were classified as non-knowledgeable. Awareness of warning signs and symptoms was assessed through 10 additional questions, with participants correctly identifying five or more warning signs considered knowledgeable.

The final section of the questionnaire assessed participants' practices related to BSE. It explored their understanding of the purpose of BSE, the recommended age to begin BSE, and the ideal timing for performing the examination. Additionally, participants were asked about the frequency of their BSE practice, reasons for not performing BSE, and their course of action if they detected an abnormality, including whom they would consult for further evaluation. Data analysis was conducted using IBM SPSS Version 27 (Statistical Package for Social Sciences). Descriptive statistics were used to summarize the demographic variables, levels of knowledge, and practice of BSE. Inferential statistical tests, such as chi-square tests, were applied to determine the relationship between education level and BSE practice, as well as between knowledge of risk factors and the actual engagement in self-examination. This analytical approach facilitated meaningful conclusions regarding breast cancer awareness and BSE practices among females of reproductive age in the targeted population.

RESULTS

A total of 254 females participated in the study. Among them, 63% (n=160) were students, 29.1% (n=74) were employed, and 6.3% (n=16) were housewives. The majority of participants were between the ages of 15 and 25 years (66.1%), and most were single (72.4%). A significant proportion (75.2%) were enrolled in medical school. All participants had prior awareness of breast cancer, with 72% (n=184) having received information from healthcare professionals. Additionally, 60% (n=153) reported learning about breast cancer through awareness campaigns or conferences, while 56% (n=144) gained knowledge from social media platforms. Among the participants, 11.8% (n=30) reported a positive family history of breast cancer, and 5.1% (n=13) had a personal history of breast disease.

In terms of knowledge regarding risk factors, 67.7% (n=172) of participants lacked awareness, while 32.3% (n=82) demonstrated adequate knowledge. The most commonly recognized risk factor was a family history of breast cancer, correctly identified by 87.4% of participants. Exposure to upper body radiation was recognized by 52.8%, while personal history of breast disease and lack of breastfeeding by the mother were each correctly identified by 47%. Conversely, a high-fat diet (19.7%) and late pregnancy (20.5%) were the least recognized risk factors. Awareness of warning signs and symptoms of breast cancer was present in 60.6% (n=154) of participants, while 39.4% (n=100) lacked sufficient knowledge. The most well-recognized symptom was the presence of a lump or swelling in the breast, acknowledged by 84.3% of participants. Changes in breast shape or size were identified by 69.3%, while bloody or fluid discharge from the nipple was recognized by 63.4%. Rash or ulceration on the nipple (38.6%) and arm swelling (19.7%) were the least acknowledged symptoms.

A statistically significant association was found between educational status and knowledge of breast cancer risk factors (P=0.016). Among MBBS/BDS students, 86% demonstrated awareness, followed by postgraduates (10.9%). A similarly significant association was observed for knowledge of warning signs and symptoms (P<0.001), with 83% of MBBS/BDS students showing adequate knowledge, followed by postgraduates (11%). Regarding the practice of Breast Self-Examination (BSE), 28% (n=71) of participants reported performing BSE regularly, while 72% (n=183) did not engage in the practice. Most participants who regularly performed BSE were from the MBBS/BDS group (73%), followed by postgraduates (19%). Despite the high educational level of participants, 76% (n=139) of MBBS/BDS students did not practice BSE.

Out of all participants, 58% recognized the benefit of early detection of breast cancer through BSE, while 56.3% were aware of the recommended frequency of performing BSE. Only 23.6% knew the appropriate timing for conducting BSE. The step most accurately identified was “feeling the breast with the palm and a minimum of three fingers,” recognized by 72.4% of participants, followed by “examining the breasts in a mirror with raised hands” (55.5%). The least recognized step was “examining breasts in a mirror with hands on hips” (33.1%). Notably, 9.4% (n=24) of participants had no knowledge of how to perform BSE. Among the reasons for not performing BSE, forgetting to check was the most common (58.3%), followed by a lack of knowledge on how to perform BSE (27.8%) and a lack

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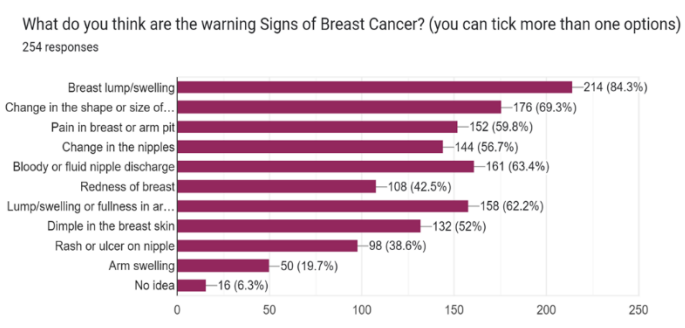
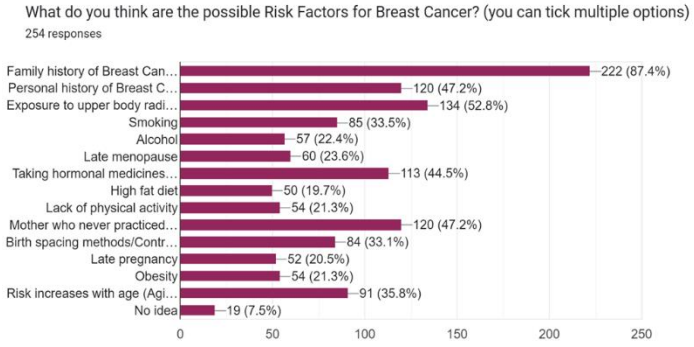
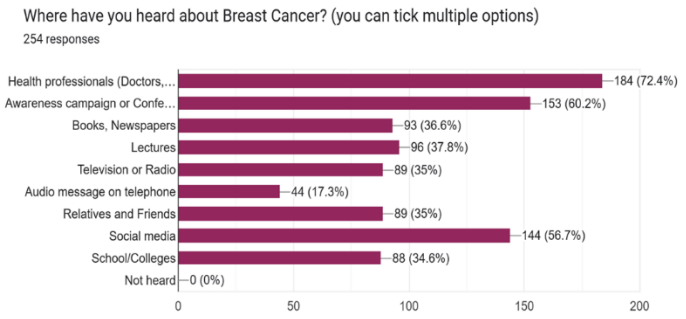
of interest (6.7%). Despite these findings, 88% of participants knew who to consult if they detected an abnormality, and 89.4% believed BSE to be a valuable method for the early detection of breast cancer. Additionally, 95.3% of participants expressed willingness to recommend BSE to friends and family.

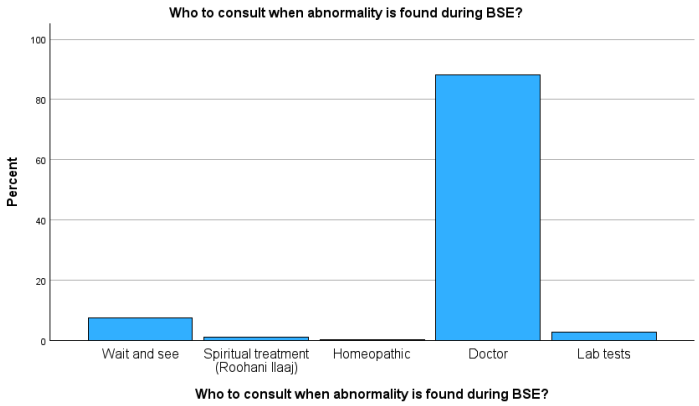
Table 1: Participants Demographic Characteristics

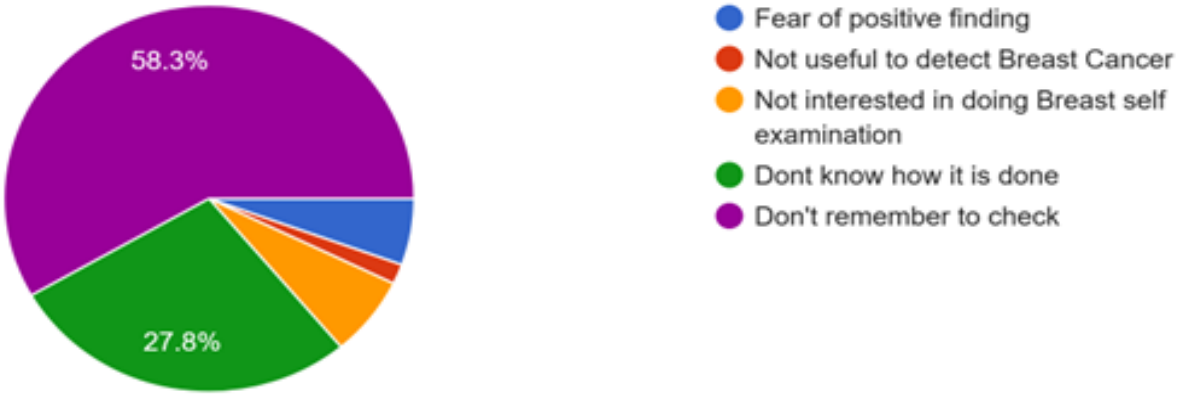
	Frequency (Percentage)
AGE (Years)	
15-25	168 (66.10%)
26-35	76 (29.90%)
36-45	9 (3.50%)
46-49	1 (0.40%)
MARITAL STATUS	
Single	184(72.4%)
Married	70 (27.60%)
Divorced	0
Widowed	0
EDUCATIONAL STATUS	
Matric/O levels	6(2.4%)
FSC/FA/A-levels	7(2.8%)
MBBS/BDS	191(75.2%)
Bachelors	18(7.1%)
Postgraduate	32(12.6%)
CURRENTLY WORKING AS	
Student	160(63%)
Employee	74(29.1%)
Housewife	16(6.3%)











Reasons for not performing Breasts Self-Examination

Table 2: Educational Status, Awareness, and Practice of Breast Self-Examination Among Female Participants (N=254)

	Matric/O-levels	FSC/FA/A-levels	MBBS/BDS	Bachelor	Postgraduates	Total
Number of participants (N=254)	6 (2.4%)	7 (2.8%)	191 (75.2%)	18 (7.1%)	32 (12.6%)	254
Awareness of breast cancer risk factors						
Knowledgeable	0 (0%)	1 (1.2%)	71 (86%)	1 (1.2%)	9 (10.9%)	82
Non-knowledgeable	6 (7.3%)	6 (7.3%)	120 (69%)	17 (9.8%)	23 (13.3%)	172
Awareness of breast cancer warning signs and symptoms						
Knowledgeable	0 (0%)	4 (2.5%)	128 (83%)	5 (3.2%)	17 (11%)	154
Non-knowledgeable	6 (6%)	3 (3%)	63 (63%)	13 (13%)	15 (15%)	100
Participants who regularly perform Breast self-examination						
Yes	1 (1.4%)	1 (1.4%)	52 (73%)	3 (4.2%)	14 (19%)	71
No	5 (3%)	6 (3.2%)	139 (76%)	15 (8.1%)	18 (10%)	183

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Table 3: Knowledge and practice of Breast self-examination (BSE) among females

What do you think are the benefits of BSE?	
Familiarity with breast texture	12 (4.7%)
Early detection of breast cancer	148 (58.3%)
Detection of abnormal changes	91 (35.8%)
No benefits	3 (1.2%)
How often do you think BSE should be done?	
Daily	8 (3.1%)
Weekly	49 (19.3%)
Monthly	143 (56.3%)
Yearly	29 (11.4%)
No idea	25 (9.8%)
What is the right time to do BSE?	
Before menstruation	18 (7.1%)
During menstruation	17 (6.7%)
After menstruation	60 (23.6%)
Any time of the month	112 (44.1%)
No idea	47 (18.5%)
The following is the part of BSE:	
Examine your breasts in a mirror with hands on hips	84 (33.1%)
Examine your breasts in a mirror with raised hands	141 (55.5%)
Feeling the breast with palm and minimum of three fingers	184 (72.4%)
Feeling the armpit with hand	124 (48.8%)
Press the nipple for checking discharge	116 (45.7%)
No idea	24 (9.4%)
Do you regularly perform BSE?	
Yes	71 (28%)
No	183 (72%)
If not, why?	
Fear of positive finding	10 (5.6%)
Not useful to detect breast cancer	3 (1.7%)
Not interested in doing BSE	12 (6.7%)
Don’t know how it is done.	50 (27.8%)
Don’t remember to check	105 (58.3%)

How often do you check your breasts?	
Once a week	34 (13.4%)
Once a month	62 (24.4%)
Once every six months	40 (15.7%)
Once a year	23 (9.1%)
Once in many years	17 (6.7%)
Never done BSE	78 (30.7%)
You will consult following, if there is any abnormality during BSE:	
Wait and see	19 (7.5%)
Spiritual (Roohani ilaaj)	3 (1.2%)
Homeopathic	1 (0.4%)
Doctor	224 (88.2%)
Lab tests	7 (2.8%)

DISCUSSION

Understanding the factors that influence breast cancer diagnosis and screening practices is essential in improving early detection and reducing mortality rates, particularly among high-risk populations. The promotion of Breast Self-Examination (BSE) as a preventive measure has gained significance due to its potential to detect abnormalities at an early stage, which can ultimately enhance patient outcomes and survival rates (11). Personalized screening approaches, particularly for women with a positive family history or increased breast density, are associated with a higher risk of breast cancer in those aged 40 to 49 years. Identifying such risk factors allows for the development of targeted screening strategies, including specialized imaging modalities such as mammography (12,13). The findings of this study revealed that healthcare professionals were the primary source of breast cancer awareness for 72% of participants, followed by awareness campaigns or conferences (60%) and social media (56%). These results contrast with those observed in studies conducted in Gaza, where university education was the primary information source for 57% of participants, and in the United Arab Emirates, where social media platforms like YouTube were more influential (14, 15). These differences may reflect regional variations in educational outreach efforts and the accessibility of information platforms.

Despite the literacy of the population studied, a significant proportion of participants (67.7%) lacked adequate knowledge of breast cancer risk factors. Only 32.3% of participants demonstrated sufficient awareness, primarily among MBBS/BDS students. A family history of breast cancer was the most frequently recognized risk factor (87.4%), which aligns with findings from similar studies in Syria, where a majority of medical students correctly identified family history as a significant determinant (16). However, the limited recognition of other important risk factors, such as high-fat diets and late pregnancy, underscores gaps in broader public health education. Knowledge of breast cancer warning signs and symptoms was evident among 60.6% of participants, with the presence of a breast lump or swelling being the most recognized sign (84.3%). This finding is consistent with research conducted in Qatar, where swelling or thickening under the armpit was the most frequently identified symptom (17). However, awareness of less common warning signs, such as rash or ulceration on the nipple and arm swelling, remained low in the current study, indicating a need for comprehensive awareness programs that emphasize both common and atypical symptoms.

When examining BSE practices, only 28% of participants reported performing BSE regularly, despite 56.3% correctly identifying the recommended frequency of monthly examinations. These findings highlight a discrepancy between knowledge and practice. Comparisons with studies conducted in Cameroon revealed a more significant lack of awareness regarding BSE frequency, with 32.9% of participants unaware of the recommended schedule (18). This suggests regional and cultural differences in breast cancer education and the effectiveness of awareness campaigns. Although the study population was largely literate, the failure of 72% of participants to

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practice BSE regularly highlights persistent barriers to implementation, including forgetfulness, lack of knowledge regarding proper techniques, and disinterest. A positive aspect of the findings is the high proportion of participants (89.4%) who acknowledged the effectiveness of BSE in early detection, with 95.3% willing to recommend the practice to friends and family. This suggests that while awareness of the importance of BSE exists, practical barriers prevent its regular application. Addressing these barriers through structured educational initiatives, such as workshops, seminars, and free training programs, could significantly improve adherence to recommended screening practices.

The study had several limitations that should be considered. The use of convenience sampling may have introduced selection bias, limiting the generalizability of the findings to the wider population of women of reproductive age. Additionally, the overrepresentation of MBBS/BDS students could have skewed results, given their inherently higher level of exposure to medical knowledge. The reduced sample size, which fell short of the calculated requirement of 380 participants, further limits the robustness of the conclusions. Despite these limitations, the study highlights important insights into breast cancer awareness and BSE practices among educated women in Pakistan. The results suggest that while educational background influences knowledge levels, it does not necessarily translate into consistent practice of BSE. Future research should focus on a more diverse population, including women from different socioeconomic and educational backgrounds, to provide a more comprehensive understanding of breast cancer awareness at a national level. The findings underscore the urgent need for targeted interventions to improve breast cancer awareness and encourage the regular practice of BSE among women of reproductive age. Tailored educational strategies, combined with community-based outreach programs, could help bridge the gap between knowledge and practice, ultimately facilitating early detection and improving patient outcomes.

CONCLUSION

This study highlights significant gaps in awareness and practice of breast cancer screening, particularly Breast Self-Examination (BSE), among females of reproductive age. Despite a generally high level of education within the sample, knowledge about breast cancer risk factors and warning signs remained insufficient, and regular BSE practice was notably low. These findings underscore the need for targeted educational interventions that go beyond merely providing information and instead focus on encouraging consistent preventive practices. Promoting BSE through structured awareness programs, community outreach, and personalized education can empower women to detect abnormalities early, potentially improving breast cancer outcomes and reducing mortality rates.

AUTHOR CONTRIBUTIONS

Author	Contribution
Rida Fatima Aslam	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Kainat Qasim	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Sahar Maqbool Butt	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muhammad Saad*	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Shahzad Akhtar Aziz	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Reema Raza	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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