


BMJ Open Screening for those at risk for anxiety and depression warranting further clinical evaluation among patients presenting to breast services: a single-centre, cross-sectional study

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ABSTRACT

Objectives Studies show that anxiety and depression are widespread across patients presenting to outpatient services for medical illnesses. We expect similar or even higher prevalence in patients with breast complaints owing to the relevance of breasts in terms of sexuality, identity and confidence. Thus, this study was proposed to estimate the prevalence and identify risk factors for being at risk for anxiety and depression in patients seeking breast services.

Design Descriptive, cross-sectional study.

Setting Tertiary care teaching hospital in Mumbai, Western India.

Participants Patients seeking breast services for either benign or malignant conditions.

Outcome measures Proportion of those at risk for clinical depression (defined as a score of ≥ 10 on Patient Health Questionnaire-9) and proportion of those at risk for clinical anxiety warranting further clinical evaluation (defined as a score of ≥ 10 on Generalized Anxiety Disorder-7) and their predictors.

Results A total of 208 patients were screened, and 192 consenting patients were enrolled. The prevalence of those at risk for anxiety requiring further clinical evaluation was 46.4% (95% CI 39.2% to 53.7%) and for those at risk for major depression that warrants further clinical evaluation by a mental health provider was 29.7% (95% CI 23.3% to 36.7%). The predictors of anxiety were age (adjusted odds ratio (aOR) 1.053; 95% CI 1.024 to 1.083; $p < 0.001$) and postmenopausal status (aOR 2.475; 95% CI 1.200 to 5.103; $p = 0.014$). The predictors of depression were age (aOR 0.954; 95% CI 1.927 to 0.981; $p = 0.001$) and rural place of residence (aOR 2.362; 95% CI 1.023 to 5.433; $p = 0.044$).

Conclusions There is a high prevalence of being at risk for anxiety and depression among patients who seek breast services warranting further clinical evaluation. The predictors of being at risk for anxiety were higher age and postmenopausal status, and for those at risk for depression were young age and residing in rural areas.

INTRODUCTION

Depression, anxiety and substance abuse are the most common yet often missed psychiatric

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study has a sufficient sample size and does not differentiate based on the final diagnosis (benign or malignant).
- ⇒ The diagnosis, whether benign or malignant, was unknown, which could have further caused mood changes.
- ⇒ The actual prevalence of anxiety and depression could not be ascertained pending clinical evaluation; only 'at risk' individuals were identified.
- ⇒ As this was a single-centre study, the results may not be generalisable to the state or country.

illnesses in non-psychiatric outpatients,^{1,2} with depression and generalised anxiety disorder (GAD) having a lifetime prevalence of 12.1% and 3.7%, respectively.^{3,4} As psychological factors are increasingly recognised as determinants of therapeutic progress, the psychosocial and cultural needs of patients ought to be considered more so because their quality of life (QoL) is an independent predictor of disease-related outcomes.⁵ However, the first step towards targeting mental well-being as part of comprehensive care is to identify the problem via patient screening and determine the presence of anxiety and/or depression, which are missed out on routine clinical assessment.

Breast-related symptoms are expected to elicit anxiety and/or depression owing to the various fears generated in a woman—for example, in cancer, losing a vital sexual organ, rejection by family or social outcasting, in addition to expenses, hospitalisation and surgery. For instance, Srivastava *et al*⁶ from North India reported that among women with benign breast diseases, 27% had major depression, 58% had minor depression and

27% had anxiety. Similarly, a meta-analysis of 36 studies that included 16 298 patients with breast cancer between 2000 and 2018 estimated the prevalence of anxiety to be at 41.9% (95% CI 30.7 to 53.2).⁷ The prevalence of depression was said to be 10%–25% in patients diagnosed with breast cancer.⁸ Thus, it becomes essential to understand the burden of anxiety and/or depression in this group of patients. A thorough literature search in the English language found that only very few studies have been conducted to estimate the prevalence of psychiatric illnesses in outpatients with breast complaints, inclusive of patients with benign breast conditions, as most studies were conducted among patients with breast cancer and the data from India were limited.

Hence, the objective of this study was to determine the prevalence and predictors of being at risk for anxiety and depression in patients presenting to the breast services of a tertiary care centre in Western India using standard validated scales such as the Generalized Anxiety Disorder-7 (GAD-7) for anxiety and the Patient Health Questionnaire-9 (PHQ-9) for depression.

METHODS

Study design and setting

A descriptive, cross-sectional study was conducted between 20 February 2021 and 15 June 2021 in a public tertiary care teaching hospital in Mumbai, a metropolitan city in Western India. The civic body, Brihanmumbai Municipal Corporation, runs the hospital, which caters predominantly to low-income and middle-income people at a highly subsidised cost. The hospital runs a separate breast services clinic mainly comprising surgeons, social health workers, and pain and palliative care physicians.

Study sample

All female patients 18 years and above with no history of dementia or lack of insight who attended the breast services for any breast-related complaints were included in the study. Those who did not provide written informed consent were excluded from the study.

Variables

The dependent variables of interest were GAD-7 and PHQ-9 scores. The predictor (independent) variables of interest were age, menopausal status, place of residence, education, occupation, marital status and presenting complaints (single breast-related symptom vs more than one).

Study procedures

After obtaining written informed consent, data were collected by face-to-face interviews using freely accessible universal questionnaires, namely GAD-7 and PHQ-9. In addition, demographic characteristics, namely age, menopausal status, place of residence, marital status, education level and occupational status, were recorded in a case record form. Clinical data, including presenting

symptoms, were also recorded. Those who were identified as at risk for anxiety and major depression requiring further evaluation by a mental health professional were referred to a certified counsellor who was available as part of the breast services team.

Data sources and measurements

Demographics and clinical characteristics were elicited based on patient history. Anxiety was evaluated using the GAD-7 scale, which is a seven-item, self-rated scale developed as a screening tool and severity indicator for GAD.⁹ Scores range from 0 to 21, with higher scores indicating more severe GAD symptoms. While screening, a cut-off score of 10 was identified as the optimal point for risk of anxiety warranting further clinical evaluation. The scale has high sensitivity (89%) and specificity (82%) for screening at this cut-off point. At follow-up, scores of 5, 10 and 15 are interpreted as representing mild, moderate and severe levels of anxiety.¹⁰

Depression was evaluated using PHQ-9, which is a self-administered depression module.¹¹ It is a nine-item scale representing the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV criteria for major depression, with each symptom criteria being scored on a Likert scale from 0 (not at all) to 3 (nearly every day).¹² A PHQ-9 score ≥ 10 had a sensitivity of 88% and a specificity of 88% for major depression that warrants further clinical evaluation by a mental health provider. PHQ-9 scores of 5, 10, 15 and 20 represent mild, moderate, moderately severe and severe depression, respectively.¹² Validated translations of both GAD-7 and PHQ-9 questionnaires in local languages, namely Hindi and Marathi, that are freely available online were used in this study.

Bias

Response biases such as social desirability (SDR) and acquiescent (ACQ) responding are well known in the setting of self-reported psychometric scales that use Likert scale.¹³ SDR refers to the inclination to react in a way that aligns with what is considered favourable by salient others. At the same time, ACQ signifies the inclination to favour the positive end of the rating scale, regardless of the item's content.¹³ An attempt to mitigate this bias was made by anonymising data collection and permitting self-administration of the questionnaires in the language of their understanding if the participant was literate. Similarly, referral bias due to referral of a particular group of patients based on the variables of interest¹⁴ was negligible as the study was conducted in the general surgery department where all patients requiring breast services, irrespective of their psychological state, took treatment.

Sample size estimation and sampling technique

Assuming the prevalence of depression and/or anxiety in patients seeking breast services to be at a similar rate seen in general Indian medical outpatients, an estimated prevalence (p) of 39.3% was considered.¹⁵ The sample size (n), estimated using the Cochran's formula $[Z_{\alpha}^2 p(100-p)/$

Table 1 Demographic characteristics and presenting complaints

Variable	Category	Frequency (N=192)	%
Age group (years)	18–44	126	65.6
	45–55	52	27.1
	≥56	14	7.3
Menopausal status	Premenopausal	145	75.5
	Postmenopausal	47	24.5
Residence	Rural	30	15.6
	Urban	162	84.4
Education	Illiterate	24	12.5
	School	107	55.7
	College	61	31.8
Occupation	Not employed	106	55.2
	Employed	86	44.8
Marital status	Not married	38	19.8
	Married	154	80.2
Presenting complaints	Lump	112	58.3
	Pain	27	14.1
	Nipple discharge	7	4.6
	More than one symptom	46	24.0

d^2],¹⁶ and assuming a relative precision (d) of 20%, an alpha error of 5% (corresponding Z score=1.96≈2) and the power of the study to be 80%, was 154. We decided to increase the same by 30%, to 192, accounting for non-responders and cognitive and response bias due to the sensitive nature of the study measures.

A systematic random sampling technique was followed, where every nth patient who attended the breast services was approached for consent, with n being chosen randomly for each day between two and five using lots.

Data management

Information was initially gathered on a case record form using a pen and paper format, which was subsequently converted into a digital format using Microsoft Excel (V.2016; Microsoft Corporation, Redmond, Washington, USA). Stringent measures were taken to ensure the confidentiality of patient data. Participant files were securely stored in locked cupboards, and digital data were safeguarded on password-protected computers. The analysis was conducted solely on the data that had been deidentified and coded reversibly. Statistical analysis was performed using SPSS for Windows (V.25.0).

Statistical analyses

Demographic and clinical characteristics were presented as mean with SD for age, and frequencies and percentages for the rest of the data. Participants scoring ≥10 on GAD-7 or PHQ-9 at screening were considered at risk for

anxiety and major depression warranting further clinical evaluation. The prevalence was represented as proportions with 95% CI. Univariate and multivariable analyses to identify the predictors of anxiety and depression were conducted using binary logistic regression. All hypothesised predictors with p value <0.2 in the univariate analyses alone were included in the multivariable analysis. The level of significance for all analyses was set at p<0.05.

Patient and public involvement

None.

RESULTS

Demographic and clinical characteristics

A total of 208 patients were screened, and 192 provided consent. The rest (n=16) did not consent to participate in the study. The mean (SD) age of our study participants was 38.7 (11.8) years, and most of them were from the 18–44 years age group (64.6%, n=126/192). Of the patients, 75.5% (n=145/192) were premenopausal and 84.4% (n=162/192) were residing in urban areas. Clinically, the most common presenting complaint reported was breast lump (58.3%, n=112/192). The demographic and clinical characteristics are summarised in [table 1](#).

Prevalence of being at risk for anxiety and depression

With GAD-7 and PHQ-9 used as screening tools, the prevalence of those at risk for anxiety requiring further clinical evaluation was 46.4% (95% CI 39.2% to 53.7%), and for those at risk for major depression that warrants further clinical evaluation by a mental health provider it was 29.7% (95% CI 23.3% to 36.7%). The details of severity are shown in [table 2](#).

Predictors of being at risk for anxiety

The predictors of anxiety were age (adjusted odds ratio (aOR) 1.053; 95% CI 1.024 to 1.083; p<0.001) and postmenopausal status (aOR 2.475; 95% CI 1.200 to 5.103; p=0.014). The results of the univariate and multivariable analyses for anxiety are given in [table 3](#).

Predictors of being at risk for depression

The predictors of depression were age (aOR 0.954; 95% CI 1.927 to 0.981; p=0.001) and rural place of residence (aOR 2.362; 95% CI 1.023 to 5.433; p=0.044). The results of the univariate and multivariable analyses for depression are given in [table 4](#).

DISCUSSION

We conducted a cross-sectional study among women seeking medical attention in the breast clinic of a tertiary care teaching hospital in the city of Mumbai in India to estimate the prevalence of those at risk for GAD and major depression requiring further clinical evaluation by a mental health professional. Among 192 patients, the prevalence of those at risk for anxiety and depression was 46.4% and 29.7%, respectively. Older women and those

**Table 2** Severity of anxiety and depression

Scale	Category			Frequency (N=192)	%
	Score range	Interpretation			
Generalized Anxiety Disorder Scale-7	0–4	No anxiety		17	8.9
	5–9	Mild		86	44.8
	10–14	Moderate		77	40.1
	15–21	Severe		12	6.3
Patient Health Questionnaire-9	0–4	No depression		40	20.8
	5–9	Mild		85	49.5
	10–14	Moderate		52	27.1
	15–19	Moderately severe		3	1.6
	20–27	Severe		2	1.0

in the postmenopausal stage were observed to be at an elevated risk of developing anxiety. At the same time, young individuals and women residing in rural areas were found to have a higher likelihood of experiencing depression.

The prevalence of those at risk for anxiety and depression is relatively high compared with the prevalence in the general population of India. As per the National Mental Health Survey, the current weighted prevalence of anxiety disorders is 2.57% (95% CI 2.54 to 2.60).¹⁷ Similarly, with regard to depression in the general population, the weighted prevalence of lifetime and current depressive disorders in a study conducted across 12 Indian states in 34802 adults was 5.25% (95% CI 5.21% to 5.29%) and 2.68% (95% CI 2.65% to 2.71%), respectively.¹⁸ It is not surprising that our participants were more likely to experience anxiety and depressive symptoms not just out of fear of cancer, but also out of fear of losing sexuality or fear of rejection, which is much more associated with breast diseases than diseases of other non-sexual body parts.

With regard to the predictors of anxiety, we found that for every 1-year increase in age, there is approximately

a 5% increased chance of being anxious. Similarly, postmenopausal women (as against premenopausal women) have approximately 2.5 times increased odds of suffering from anxiety. This is probably because awareness about malignant disorders is quite good these days among the general public, and the participants are likely to be aware that increasing age and postmenopausal status are independent risk factors for malignant diseases.

On the contrary, we report that there is approximately a 5% decreased chance of depression with every 1-year increase in age, suggesting that younger women are more at risk for depression. This is most likely associated with concerns regarding marriage and family life. As per the 2005 Indian Human Development Survey, less than 5% of women had the 'primary role in choosing their husbands'.¹⁹ This most compellingly indicates why younger patients could have higher depression—fear of loss of cosmesis, decrease in 'marriageability quotient' and losing their identity. In a study of patients with breast cancer, younger women were found to have higher depression scores,²⁰ explained by the fact that this age group of women has higher aspirations than the elderly.

Table 3 Predictors of anxiety: univariate and multivariable analyses

Variable*	Univariate analysis		Multivariable analysis		
	OR	P value	Adjusted OR	95% CI	P value
Age	1.050	<0.001	1.053	1.024 to 1.083	<0.001
Menopausal status	1.807	0.081	2.475	1.200 to 5.103	0.014
Residence	1.189	0.663	Not included in the analysis		
Education	1.578	0.143	0.723	0.444 to 1.177	0.192
Occupation	0.767	0.362	Not included in the analysis		
Marital status	1.562	0.221	Not included in the analysis		
Presenting complaints	0.764	0.432	Not included in the analysis		

Nagelkerke R square=0.138.

*Age is taken as a continuous variable. For other variables, the categories coded as risk (code=0) are as follows: menopausal status: postmenopausal; residence: rural; education: illiterate; occupation: unemployed; marital status: unmarried; presenting complaints: more than one.

Table 4 Predictors of depression: univariate and multivariable analyses

Variable*	Univariate analysis		Multivariable analysis		
	OR	P value	Adjusted OR	95% CI	P value
Age	0.956	0.001	0.954	0.927 to 0.981	0.001
Menopausal status	1.006	0.986	Not included in the analysis		
Residence	2.051	0.079	2.362	1.023 to 5.453	0.044
Education	1.107	0.763	Not included in the analysis		
Occupation	0.706	0.271	Not included in the analysis		
Marital status	1.300	0.496	Not included in the analysis		
Presenting complaints	1.107	0.763	Not included in the analysis.		

Nagelkerke R square=0.106.
 *Age is taken as a continuous variable. For other variables, the categories coded as risk (code=0) are as follows: menopausal status: postmenopausal; residence: rural; education: illiterate; occupation: unemployed; marital status: unmarried; presenting complaints: more than one.

On a similar note, rural women had approximately 2.4 times increased odds of being at risk for depression compared with their urban peers. This is in line with the general trends observed in rural as against the urban population in developed countries.²¹ Many factors could explain the urban–rural disparity, such as higher prevalence of lower socioeconomic population with lack of ample economic opportunities; limited education and lack of awareness; stigma associated with mental illnesses; lack of quality healthcare services, including mental health services; and traditional gender roles and expectations, such as household chores, childcare and caregiving for elderly family members. These factors also lead to higher levels of stress and emotional exhaustion, and sometimes even social isolation with limited social interaction and support networks.^{21 22} In India, although many studies suggest that there is a higher prevalence of mental disorders among the urban public than the rural, we believe that under-reporting due to various reasons mentioned above could be a factor for the differences observed.²¹

The strength of our study is that it has a sufficiently large sample size and does not differentiate based on the final diagnosis (benign or malignant). However, there are a few limitations as well. Since it was not a cohort study, the diagnosis, whether benign or malignant, was not known, which could have further caused mood changes. Additionally, the actual prevalence of anxiety and disorder could not be ascertained as the participants' status with regard to evaluation by a mental healthcare provider was unknown. Also, since there was no longitudinal follow-up done and the largest proportion reported to have mild to moderate anxiety and/or depression, the stability of the diagnosis over a period of time and its association with the illness could not be ascertained. We recommend cohort studies in the future to overcome these limitations and to plan for future interventional studies to evaluate survival rates, QoL and other outcomes. Further, the study is a single-centre study from a large metropolis; hence, the results may not be generalisable to the entire state or

country. More large multicentre studies are required to further confirm our findings.

In summary, the risk for GAD and major depression requiring further clinical evaluation by a mental health professional is relatively high among patients seeking breast care services when compared with the general population. Thus, clinicians and healthcare professions must include mental health consultations in the treatment plan. Alternatively, a multidisciplinary team consisting of mental health professionals may be formed to provide holistic breast care services. Older women and postmenopausal status were likely to be at increased risk for anxiety, while young age and rural women were identified to be more at risk for depression. Thus, we recommend routine screening for mental health issues at breast clinics and implementing QoL-enhancing measures for better overall outcomes, especially for those who are at high risk. We believe this would go a long way in identifying and managing these otherwise neglected psychological illnesses.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Obtained.

Ethics approval This study involves human participants and received authorisation from the Institutional Ethics Committee at the hospital where it took place (Seth GS Medical College and KEM Hospital), identified by reference number EC/OA-181/2020, dated 19 February 2021. The research adhered to the principles of Good Clinical Practice outlined in the Declaration of Helsinki (World Medical Association, Fortaleza, 2013) and followed the National Guidelines for Ethical



Research in Human Participants (Indian Council of Medical Research Guidelines, 2017). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

Deidentified individual participant data are available with the corresponding author and will be shared upon reasonable request for future research/ policy or guideline development.

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