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Social Emotion Recognition, Social Functioning and Suicidal Behaviour in Breast Cancer Patients in India

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Abstract

Aims: lack of emotional connection and poor social support are the influential factors for developing suicidal ideation. Studies have established social cognitive deficit in patients with depression, autism, schizophrenia. However, no study so far has investigated about the status social factors in breast cancer patients who often suffer from suicidal thoughts. We hypothesized the relationship between social emotion recognition, social support and suicidal thoughts in breast cancer patients.

Method: The cross–sectional study was conducted at the Oncology department of a multi–speciality hospital in Kolkata. There were 176 breast cancer patients: depressed breast cancer patients having suicidal idea (Group–I; N=81), non–suicidal idea depressed breast cancer individuals (Group–II; N=48), and breast cancer with no psychiatric history (Group–III; N=47). Baron–Cohen's Reading the Mind in the Eyes Test and Multidimensional Perceived Social was used for comparing the performance of social support and mind reading abilities in these three groups.

Results: All groups performed poorly compared to Group–III (*29.1±1.27*). RMT scores for study Groups I and II were observed as (*17.9±0.14) vs* (*20.32±061)*. There was an interaction between suicidal thoughts and depression, was also significant ((F=69.5, sig=0.001). this difference remained significant after controlling for demographic variables.

Conclusions: Suicidal ideation was associated with impaired social emotion recognition and social support. This affects their ability to prop up for social support. This needs to be signified urgently to make sure a better quality of life.

Key words: *Breast cancer, theory of mind, suicidal thoughts and depression*

Introduction

Breast cancer has one of the highest five years' survival rates among female cancer patients in India (Agarwal et al., 2009). Depression is common psychological issues in patients with breast cancer, with a reported prevalence between 10% to 25% (Popoola & Adewuya, 2012) (Qiu et al., 2012). Various studies have established social cognitive deficits in patients with depression, autism, schizophrenia (Cao et al., 2013) (Kerr et al., 2003b). As a result, depressed individuals have dysfunctional interaction patterns and problems in interpreting interpersonal information like emotions and their expressions (Valk et al., 2003). Deficit in social interactions of depressed patients has a major role in the onset and maintenance of depression (Inoue et al., 2006; Kerr et al., 2003) (Kerr et al., 2003), thus setting up a vicious cycle.

Suicide rates are likely to be associated with the level of acceptance of suicidal behaviour in particular cultures. In India, for example, religion prohibit death by suicide and it is trusted that one who commits suicide will not attain *moksha* (self–liberation); it is considered a crime. However, the epics mention the ending of one's life as justified under certain circumstances such as when a person is suffering from an incurable disease or intolerable pain (Gehlot & Nathawat, 1983). Social discouragement has also played an important role in preventing a person from committing suicide; for example, family bonding and commitments, and social stigma played a buffering role. However, the actual incidence of suicide in cancer patients is probably underestimated, as there may be unwillingness to report such deaths in these situations (Ganz, 2008).

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A study of depressed individuals found that performance on the Reading the Mind in the Eyes test (RME) (Baron–Cohen et al., 2001), a widely used measure of complex social emotion recognition, was impaired in individuals who suffers from suicidal ideation, sadness, and guilt, or "hopelessness depression", but unconnected to the overall gravity of depression. Given that normal aging is associated with a decline in emotion recognition (Ruffman et al., 2008), so deficits in social cognition may be particularly influential factor to suicidal behavior in breast cancer patients.

Previous study said, individuals with higher social support may be more than 30% less likely to have a lifetime suicide attempt comparing with lower social support (Sheftall et al., 2013). Social support leads someone to "believe that he/she is cared for and loved, esteemed, and a member of a network of mutual obligations" (Cobb, 1976). Moreover, studies had provided initial evidence about social support may communicate resiliency to suicide ideation. Some findings showed that social support is directly associated with lower occurrence of desire of these types of thoughts (Fisher et al., 2015).

Therefore, this study attempted to examine effect of influential factors such as social emotion recognition, social support that breast cancer patients desire to death. This needs to be signified urgently and might be remediable with psychosocial intervention to make sure a better quality of life among patients.

Materials and Methods

This observational and cross–sectional study was conducted among non–metastatic Breast cancer patients receiving neo adjuvant chemotherapy at the outpatient department (OPD) of Oncology at Super specialty hospital in West Bengal, India. The study was approved by the Institutional Scientific and Ethical Review Board following terms and condition of Indian Council of Medical Research (ICMR). A total of 176 patients with non–metastatic breast cancer were selected as per sample of convenience and consecutive sampling technique during a 11–months period (from April 2019 to February 2020). For descriptive estimation of such observational studies, a sample size of 176 as recommended in the literature (Datta A et al., 2021) was adopted for assessing relationship between social emotion recognition, social support and suicidal thoughts in breast cancer patients. Informed consent was obtained using the standard informed consent form laid down by Indian Council of Medical Research (ICMR) (Mathur, R 2017.), the apex body governing biomedical research in India. All participants underwent psychological assessment and were categorized into "Depressed Breast cancer with presence of suicidal ideas–Group–I", "Depressed Breast Cancer patients without suicidal ideas–Group–II" and "Breast cancer patients without any psychological history–Group–III" based on their responses. Mini International Neuropsychiatric Interview (M.I.N.I) was administered among those with diagnosis first episode depression (mild or moderate severity) as per International Classification of Diseases – 10th Edition (ICD 10) (Sartorius et al., 2013) as confirmed by experienced psychiatrist. Suicidal thoughts were defined by The Scale for Suicidal Ideation (SIS) (K.S. Latha et al. 2005) at the first visit of each patient in the study. Patients' charts were reviewed for clinical data, such as MINI and SIS scores and clinical psychologist was included patients into three groups: – (Group–I; N=81), (Group–II; N=48) and (Group–III; N=47) (Fig–1). Psychologist had assessed the Reading Mind in the Eyes test, a well–known social cognitive skill task (Baron–cohen et al., 2001;) and Multidimensional Scale of Perceived Social Support (MSPSS) (Somasundaram & Devamani, 2016) to determine socio emotional level and the adequacy of social support received from three different sources namely family, friends and significant others respectively.

Following were the inclusion and exclusion criteria

Inclusion criteria

- Age between 30 to 60 years
- Diagnosed patients with non–metastatic breast cancer
- Patients undergoing neo adjuvant chemotherapy
- Willing to participate in the study
- Minimum eight years of formal education

Exclusion criteria

- Inability to understand/read Bengali language

Informed consent was obtained using the standard informed consent form laid down by Indian Council of Medical Research (ICMR)[23], the apex body governing biomedical research in India.

Data collection

Demographic data were collected from all the groups of the study population, followed by administration of tests in a single interview.

Instruments

Semi structured proforma

A semi structured proforma was developed to assess the sociodemographic and clinical details of the study subjects.

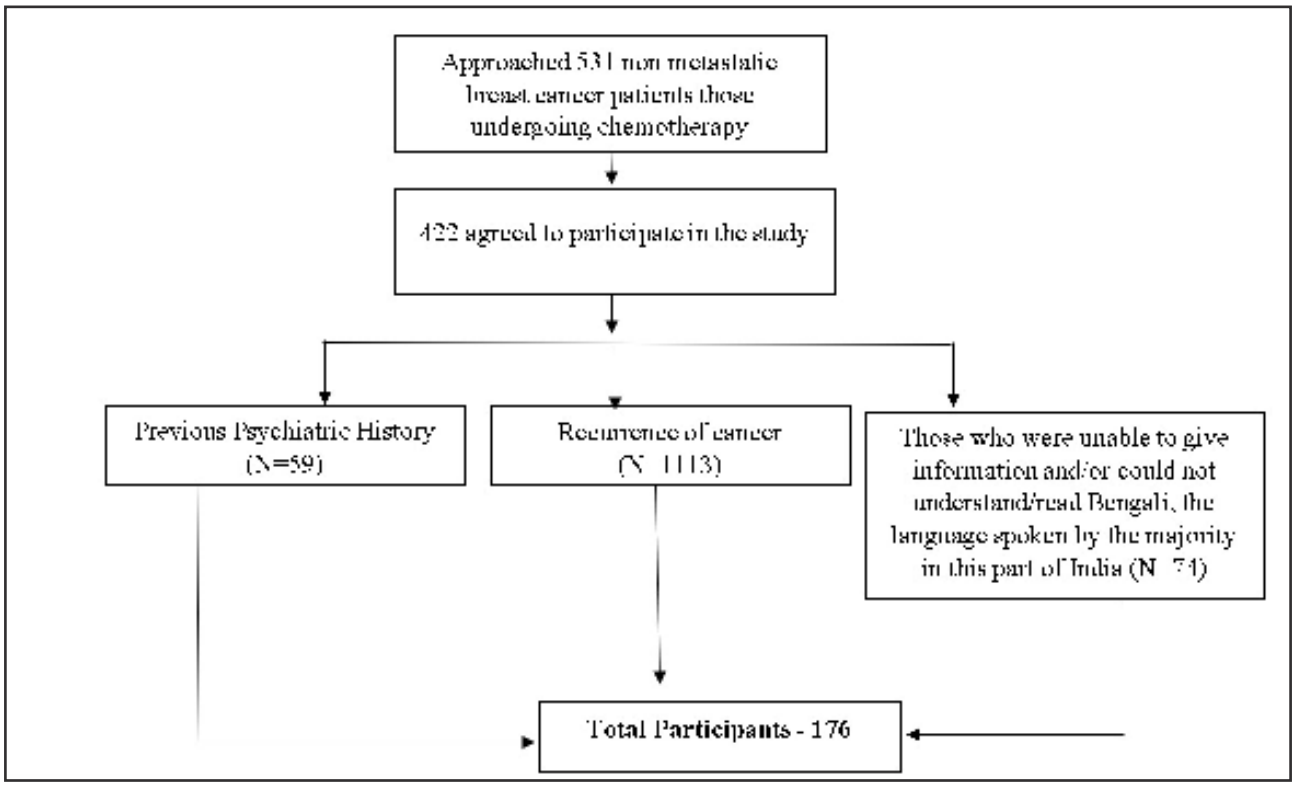

Figure 1: Consort Diagram

M.I.N.I

The Mini–International Neuropsychiatric Interview (M.I.N.I.) is a short structured diagnostic interview which was developed jointly by psychiatrists and clinicians in the United States and Europe following for DSM–IV and ICD–10 psychiatric disorders. It takes time of approximately 15 minutes for administration, it is easy to conduct. It is validated in different Indian languages, including Bengali, the language most spoken in this part of the country.

Reading Mind in the Eyes Test:

This test, which is meant to evaluate mind–reading ability, was developed by Baron–Cohen, et al. in 2001. The revised form of this test includes photographs from eye region (from eyebrows to halfway down the bridge of the nose) of actors in 36 different forms. For each photograph, four words describing mental states with similar emotional capacity are presented. Respondents are asked to pick the word that best describes the mental state of the person in the photograph. The maximum score achievable for choosing the right words in the test is 36 and the minimum is zero. In the scoring stage, each correct answer is worth one point and overall scores range from zero to 36. Overall scores between 22 and 30 demonstrate a medium theory of mind; scores lower than 22 shows a low theory of mind; and scores higher than 30 indicate a high theory of mind[24].

The Scale for Suicide Ideation (SIS)

This scale quantifies the severity of current suicidal thoughts and wishes. It includes 19 items, each with 3 choices—0 (least severe), 1 (severe) and 2 (most severe). The total score is computed by summing up the individual item ratings; it can range from 0 to 38. The items quantify the frequency and duration of suicidal thoughts as well as the patient's attitude towards them. Subjective feelings of control regarding suicidal ideation are also assessed. The scale was completed by the examiner in a semi–structured interview with the patient[25].

Multidimensional scale of perceived social support

The Multidimensional Scale of Perceived Social Support (MSPSS), developed by Zimet et al. (Zimet GD et al. 1988) was used to assess the perceived social support. The scale evaluates the adequacy of social support received from three different sources namely family, friends and significant others. It consists of 12 items. Each item is rated on a 7 point scale (1, very strongly disagree to 7, very strongly agree). Total scores range from 12 to 84. High scores indicate high social support. The scale demonstrated good internal consistency with an alpha coefficient of 0.85–0.91[22].

Consent form

Informed consent was obtained from all participants in writing according to the format laid down by the Indian Council for Medical Research (ICMR), the apex body governing research in India[26].

Procedure

Written informed consent was obtained from all participants. Study protocol was approved by Ethical Committee of the institute. Demographic data were collected via interview using the semi–structured proforma. After assessing psychiatric state using MINI by psychiatrist. Presence of suicidal thoughts in the breast cancer SIS. Clinical psychologist, they were given the Reading Mind in the Eyes test and Multi–dimensional social support scale.

Statistical analysis

SPSS program version 24 was used for compilation and analysis of data. Descriptive statistics were calculated as the mean ± standard deviation of age and frequency of demographic factors was tabulated according to relationship status, residence, education, occupation and per capita family income as well as clinicopathological factor including histopathology, number of since of diagnosis, stage of disease, hormonal status estrogen receptor (ER), progesterone receptor (PR), Human epidermal growth factor receptor 2(HER2), stage of the disease and days snice diagnosis were included to determine comparability according to three groups. The Chi–square test was used to compare categorical variables (breast cancer with depression with suicide idea vs breast cancer with depression without suicidal idea) and (breast cancer with depression with suicide idea vs breast cancer). Two–way ANOVA test was also used to determine the effect of two predictor variables depression (with and without) and suicidal idea (with and without) on a continuous outcome variable (RMT score and MSPSS score). Statistical significance was defined at $p < 0.05$.

Results

Demographic Information

Table 1 shows the demographic details of participants in each group. The mean age of Group–I was 56.63±1.18 years, while it was 54.31 ± 0.21 in Group–II, and 50.32±0.06 in the breast cancer without any psychiatric history group. All groups were comparable in terms of sociodemographic variables.

In Group–I (depressed breast cancer with suicidal thoughts), 87.1% were living with their spouse and 68.1% were coming from rural areas. 41.9% received less than 10 years of formal education and 87.1% women were homemakers. Majority belonged to low socioeconomic status (500 to 1000 Indian rupees per capita per month).

In case of Group–II (depressed breast cancer without suicidal thoughts) majority were living with spouse (94.3%) and most of them hailed from rural areas (72.1%). 49.1% received less than 10 years of formal education and most of them were homemakers (91.8%). Here also a large majority of women belonged to a low socioeconomic status.

In Group–III (Breast cancer without any Psychiatric History), 83.5% were living with spouse and most of them were coming from rural area (61.8%). 55.9% received less than 10 years of education and 16.6% of patients were involved in work other than homemaking.

Clinicopathological Details

Pathological and histological data are described in the number of ER positive is higher (70.1%) in Group–III (breast cancer without psychiatric history) than other two groups while PR positive is higher (72.3%) in Group–I (breast cancer with depression with suicidal ideas) and Her2 overexpress is higher (53.7%) in Group–II (breast cancer with depression without suicidal thoughts) than other two.

RMT & MPSS score

The RMT scores for each group are shown in table 2. All groups performed poorly compared to breast cancer without any psychiatric history (*29.1±1.27*). RMT scores for study Groups I and II were observed as (*17.9±0.14) vs* (*20.32±061)*.

The MPSS scores for each group are shown in table 2. All groups performed poorly compared to breast cancer without any psychiatric history (*60.63±1.03*). RMT scores for study Groups I and II were observed as (*43.4±1.12) vs* (*52.3±0.14)*.

There was RME revealed a significant group effect, “suicidal thoughts” word (F=31.52, sig=0.000) weighing more than “depression” word (F=49.57, sig=0.003). Finally, there was an interaction between suicidal thoughts and depression, was also significant (F=69.5, sig=0.001). this difference remained significant after controlling for demographic variables (Table 3)

There was MPSS revealed a significant group effect, “suicidal thoughts” word (F=49.66, sig=0.000) weighing more than “depression” word (F=55.9, sig=0.000). Finally, there was an interaction between suicidal thoughts and depression, was also significant ((F=81.42, sig=0.002). this difference remained significant after controlling for demographic variables (Table 3)

Demographic Character	Group–I (N=81)	Group–II (N=48)	Group–III (N=47)	p–value
Age	56.63±1.18	0.21 ± 54.31	50.32±0.06	0.76
Religion				
Hindu	89.1%	79.5%	79.4%	.001*
Muslim	10.9%	20.5%	20.6%	
Relationship Status				
Living with spouse	87.1%	94.3%	83.5%	0.98
Living alone	12.9%	5.7%	16.5%	
Residence				
Rural	68.1%	72.1%	61.8%	1.12
Urban	31.9%	27.9%	38.2%	
Education				
Primary education	41.9%	49.1%	55.9%	0.052
High School	37.1%	32.1%	14.7%	
Graduate	21.0%	18.9%	29.4%	
Family income				
≤500	20.1%	72.3%	41.2%	0.75
500–1000	38%	16.4%	17.6%	
1001–3000	24.2%	9.4%	32.4%	
>3000	17.7%	1.9%	8.8%	
Occupation				
Home maker	87.1%	91.8%	83.5%	0.066
Engaged with type of work	12.9%	8.2%	16.6%	
Histopathothology				
Duct Carcinoma	85.18%	60.42%	55.32%	0.087
Lobular Carcinoma	14.82%	39.58%	44.68%	
Pathological history				
Estrogen Receptor				
Positive	69.4%	64.8%	70.1%	1.02
Negative	30.6%	35.2%	29.9%	
Progesterone Receptor				
Positive	72.3%	50.1%	49.4%	0.098
Negative	27.7%	49.9%	50.6%	
HER2				
Overexpress	41.9%	53.7%	44.5%	0.079
Not overexpress	58.1%	46.3%	55.5%	
Tumor grade				
I	24.1%	18.4%	23.7%	1.1
II	46.3%	39.3%	50.1%	
III	29.6%	42.3%	26.2%	
Stage of disease				
Stage–I	17.4%	20.3%	32.3%	0.004*
Stage–II	39.2%	42.1%	42.6%	
Stage–III	43.4%	37.6%	25.1%	
Number of days since				
diagnosis				
≤3 months	35.3%	44.1%	34.8%	0.076
>3months	64.7%	55.9%	65.2%	

Table 1: Descriptive data: Evaluation of the Groups According to Demographic Characteristics
**p=<0.005*

Group–I (RMT score)	Group–II			Group–III		
	RMT score	p–value	95% CI	RMT score	p–value	95% CI
(17.9 ± 0.14)	(20.32 ± 0.61)	0.03*	13.78–20.23	(29.1±1.27)	0.00*	18.2–22.09
(MSPSS score)	MPSS score	p–value	95% CI	MPSS score	p–value	95% CI
(43.4±1.12)	52.3±0.14	0.03*	42.56–51.5	(60.63±1.03)	0.000*	52.1–56.7

Table 2: Prevalence of reading the mind in the eyes test among breast cancer and MDD patients
**p=<0.005*

Effect	Sum of square	df	Mean square	F	Value
Group–I	742.61	1	537.49	31.52	0.000*
Group–II	879.428	1	720.5	49.57	.003*
Suicidal thought*Depression	1704.632	1	1701.57	69.5	.001*

Table 3: Social Emotion Recognition as Measured by the Reading Mind in the Eyes Test and Group Status
**p=<0.005*

Effect	Sum of square	df	Mean square	F	Value
Group–I	767.41	1	641.34	49.66	0.000*
Group–II	659.32	1	569.67	55.9	0.000*
Suicidal thought*Depression	1906.53	1	1904.44	81.42	0.002*

Table 4: Social support as Measured by the Multidimensional scale of perceived social support and Group Status

Discussion

Suicidal ideations are relatively is a problem of world–wide among terminally ill patients and there is a need for more research on protective factors in suicide. This study provides such potential factors– socio emotion and community support to examine the role in suicidal ideation among breast cancer patients.

The results of the present study reported, socio emotional deficits exist among all the participants. However, the deficit was significantly higher in Group–I as compared to Group–III (Table 1). Social emotion, mental representation of one's own and others' inner world are necessary to come to adequate communication skills. Patients with social emotional deficits reported negative social interaction, unable to feel a sense of social belonging and it allows to slip into depression. Consistent with previous studies, social constraints provoke in cognitive processing of the cancer experience that leading to poorer adjustment and wellbeing (Cordova et al. 2001; Makabe and Nomizu 2006; Tempelaar et al. 1989) Results from our study suggests that emotional recognition ability in the Group–II fall intermediate between Group–I and Group–III comparators, and differs significantly from either group. Our findings contribute, difficulties in emotion recognition are selectively associated with a cognitive dimension of depression (Lee et al. 2005).

Using data from SIS, we found, suicidal ideation/ desire for death may occur with greater frequency among Group–I patients who have poor community support compared with the other two groups (Group–II & Group–III), was less likely to have close friends and they did not participate in any volunteer activities. Small social networks, infrequent participation in social activities, and perceived isolation all have been linked to mental health problems in those patients. It has been suggested that community support has a buffering effect, protecting patients from the impact of stressors. Social disincentives have also played an important role in preventing a person from committing suicide; for example family attachment, dedication and stigma particularly in developing countries like India where the diseases discriminate the patients from others (Wilson, Curran, and McPherson 2005).

In summary our findings indicate that the deficit in social cognition leads to chronic interpersonal difficulties which may lead to lack of perceived social support, are associated with suicidal thoughts in breast cancer patients. This confirms our assumption that breast cancer patients' social cognition deficit made her lose her valuable community support as independent risk factors for developing suicidal ideation and these are often factoring to contribute to patients having problems in coping with the impacts of physically ill health and functional impairment.

Conclusion

Suicidal ideation in depressed breast cancer patients were associated with poor social problem–solving, constricted social networks, and disruptive interpersonal relationships. As social support is an important component of overall survival of breast cancer patients, and better ToM is likely to translate into better social adjustment and support, one needs to devise ways to improve depression and ToM in breast cancer patients as a priority. This report points out the importance of social support in cancer along with provides recommendations for health care professionals.

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Conflict of interest

No Conflict of interest

Reference

1. Agarwal, G., Ramakant, P., Sánchez Forgach, E. R., Rendón, J. C., Chaparro, J. M., Basurto, C. S., & Margaritoni, M. (2009). Breast cancer care in developing countries. In World Journal of Surgery, 33(10), 2069–76. https://doi.org/10.1007/s00268–009–0150–z
2. Popoola, A. O., & Adewuya, A. O. (2012). Prevalence and correlates of depressive disorders in outpatients with breast cancer in Lagos, Nigeria. Psycho–Oncology, 21(6), 675–679. https://doi.org/10.1002/pon.1968
3. Qiu, J., Yang, M., Chen, W., Gao, X., Liu, S., Shi, S., & Xie, B. (2012). Prevalence and correlates of major depressive disorder in breast cancer survivors in Shanghai, China. Psycho–Oncology, 21(12), 1331–1337. https://doi.org/10.1002/pon.2075
4. Cao, Y., Zhao, Q. Di, Hu, L. J., Sun, Z. Q., Sun, S. P., Yun, W. W., & Yuan, Y. G. (2013). Theory of mind deficits in patients with esophageal cancer combined with depression. World Journal of Gastroenterology, 19 (19), 2969–2973. https://doi.org/10.3748/wjg.v19.i19.2969
5. Kerr, N., Dunbar, R. I. M., & Bentall, R. P. (2003). Theory of mind deficits in bipolar affective disorder. Journal of Affective Disorders, 73(3), 253–259. https://doi.org/10.1016/S0165–0327(02)00008–3
6. Valk, R., Ruus, T., Aire, N., Schmidt, M., & Eilola, T. (2003). Mind–reading ability : Beliefs and performance. Journal of Research in Personality, 37(5), 420–445. https://doi.org/10.1016/S0092–6566(03)00021–7
7. Inoue, Y., Yamada, K., & Kanba, S. (2006). Deficit in theory of mind is a risk for relapse of major depression. Journal Affect Disorder, 95(1–3), 125–127. https://doi.org/10.1016/j.jad.2006.04.018
8. Gehlot, P. S., & Nathawat, S. S. (1983). Suicide and family constellation in India. American Journal of Psychotherapy. https://doi.org/10.1176/appi.psychotherapy.1983.37.2.273
9. Baron–cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). *The '"* Reading the Mind in the Eyes "' Test Revised Version : A Study with Normal Adults , and Adults with Asperger Syndrome or High–functioning Autism. Journal of Child Psychology Psychiatry, 42(2), 241–251.
10. https://doi.org/10.1017/S0021963001006643
11. Ruffman, T., Henry, J. D., Livingstone, V., & Phillips, L. H. (2008). A meta–analytic review of emotion recognition and aging: Implications for neuropsychological models of aging. In Neuroscience and Biobehavioral Reviews, 32(4), 863–81. https://doi.org/10.1016/j.neubiorev.2008.01.001
12. Sheftall, A. H., Mathias, C. W., Furr, R. M., & Dougherty, D. M. (2013). Adolescent attachment security, family functioning, and suicide attempts. Attachment and Human Development, 15(4), 368–383. https://doi.org/10.1080/14616734.2013.782649
13. Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38(5), 300–314. https://doi.org/10.1097/00006842–197609000–00003
14. Fisher, L. B., Overholser, J. C., Ridley, J., Braden, A., & Rosoff, C. (2015). From the outside looking in: Sense of belonging, depression, and suicide risk. Psychiatry (New York). https://doi.org/10.1080/00332747.2015.1015867
15. Datta A, Guha P, Rathi M, Chaudhuri T. (2021).Theory of mind deficit in women with breast cancer and depression: A comparative study*:* Indian Journal of cancer. fhttps://www.indianjcancer.com/preprintarticle.asp?id=315797;type=0
16. Mathur, R. (2017). Indian Council of Medical Research 2017 National Ethical Guidlines For Biomedical and Health Research Involving Human Participants. www.icmr.nic.in.
17. Sartorius, N., Haghir, H., Mokhber, N., Azarpazhooh, M. R., Haghighi, M. B., Radmard, et al. (2013). The ICD–10 Classification of Mental and Behavioural Disorders. IACAPAP E–Textbook of Child and Adolescent Mental Health, 55(1993), 135–139. https://doi.org/10.4103/0019
18. Latha KS, Bhat SM. Suicidal behaviour among terminally ill cancer patients in India. Indian J Psychiatry [Internet]. 2005 [cited 2021 Oct 17];47(2):79. Available from: /pmc/articles/PMC2918304/

19. Somasundaram, R. O., & Devamani, K. A. (2016). A comparative study on resilience, perceived social support and hopelessness among cancer patients treated with curative and palliative care. Indian Journal of Palliative Care, 22(2), 135–140. https://doi.org/10.4103/0973–1075.179606

20. Cordova MJ, Cunningham LL, Carlson CR, Andrykowski MA. Social constraints, cognitive processing, and adjustment to breast cancer. J Consult Clin Psychol. 2001 Aug;69(4):706–11.

21. Makabe R, Nomizu T. Social support and psychological and physical states among Japanese patients with breast cancer and their spouses prior to surgery. Oncol Nurs Forum. 2006;33(3):651–5.

22. Tempelaar R, de Haes JCJM, de Ruiter JH, Bakker D, van den Heuvel WJA, van Nieuwenhuijzen MG. The social experiences of cancer patients under treatment: A comparative study. Soc Sci Med. 1989;29(5):635–42.

23. Lee L, Harkness KL, Sabbagh MA, Jacobson JA. Mental state decoding abilities in clinical depression. J Affect Disord. 2005.

24. Wilson KG, Curran D, McPherson CJ. A burden to others: A common source of distress for the terminally ill. Cogn Behav Ther. 2005.