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COGNITIVE DISTORTIONS, DEPRESSION AND SUICIDAL IDEATION IN MASTECTOMIZED BREAST CANCER PATIENTS

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ABSTRACT

This study aims to analyze the psychological factors affecting mastectomized breast cancer females undergoing radiation treatment. Fifty-one patients (M_{age} = 45.22, SD = 12.35), were recruited from oncology outpatient clinics of 3 government hospitals of Lahore, Pakistan through purposive sampling. Participants responded to Demographic Information Form, Cognitive Distortions, Siddiqui Shah Depression and Beck Suicidal Ideation Scales. Moderated regression analysis used to determine the direct and moderated links between study variables in a series of five regression models suggests that stressful thinking predicts depression and suicidal ideation. Suicidal ideation was also more significant and stronger with depressive symptoms at a high level of self-blame by patients. The link between suicidal ideation and depressive symptoms was strong at the high level of predictive thinking. Whereas, at low levels of suicidal ideation, the link between predictive thinking and depressive symptoms was more significant. Cognitive distortions were overall found to moderate the relationship between depression and suicidal ideation. Thus, emphasis is placed on the coordination between oncologists and psycho-oncologist in providing appropriate interventions to breast cancer patients.

INTRODUCTION

Breast cancer is a noticeable diagnosis in females across the world, and therefore some institutions of Pakistan are working for the registry of cancer.

However, such institutes are insufficient, and their work is still to be expanded to all provinces of Pakistan to maintain the appropriate statistics of cancer prevalence nationwide. According to the recent local literature, the breast cancer statistics in Karachi were reported to be 69.1 per 1 million. Most of the cases were reported to be in stages III and IV. Lahore is the most cancer prevailing city with a 46% prevalence rate (Arshad et al., 2019)

Being diagnosed with cancer is an emotional and psychological experience, along with physical discomfort. Mastectomy is one of the many aspects of this disease that causes psychological problems. Mastectomy is a surgery that involves removing all breasts of women with Stage III breast cancer. Radiation therapy is often recommended for women with stage III breast cancer following surgery. The treatment can destroy cancer cells that may have been missed. After the surgery, mastectomized women struggle with their lost identity and sense of lost sexuality (Wong et al., 2019). Empirical evidence from a study conducted in 2002 in Pakistan suggests that among 566 participants who had breast cancer, most of the patients underwent mastectomy (Malik, 2002), and increased anxiety and depression were found in cancer patients before their mastectomy (Farooqi,2005). After losing a part of themselves, these women feel incomplete and suffer from severe anxiety and depression (Khan et al., 2016). Pakistani women in an empirical instigation also verbalized their denial, worries, and inadequate self-image throughout the span from diagnosis of breast cancer to mastectomy (Hussain et al., 2019). Literature from Iran suggests that cognitive distortions towards life events contribute to and predict dysfunctional attitudes, depression, and anxiety in cancer patients (Bashiri et al., 2018; Musarezaie., 2015).

Psychological Disorders are widely associated with a cancer diagnosis that, in turn, affect the treatment, recovery, and quality of life of the patient (Zhu et al., 2017). However, little attention is given to cancer patient's mental health needs during their treatment (Bray et al., 2018). Women diagnosed with breast cancer demonstrate affective distress, increasing the risk of suicide and suicidal ideation in them. Researchers suggest that cognitive distortions present in cancer patients affect their psychological adjustment (Zhong & Wang, 2013). Challenging these cognitive distortions in cancer patients has improved their psychological condition and hope to fight the illness (Younesi et al., 2012). Aron. T. Beck gave a theoretical framework that postulates that people become depressed by perceiving the events they experience rather than by the events themselves. They tend to interpret their environmental experiences negatively. According to the cognitive model of Psychopathology, emotional and behavioral problems are determined by the maladaptive interpretations superimposed on external reality. Maladaptive dysfunctional schemas and cognitive distortions are said to be involved in the process of misinterpretation of events. (Beck, 1991). The cognitive theory postulates that depression develops due to invalid thinking patterns. Therefore, cancer patients have depression and suicidal ideation because of their disease or sense of loss and their anticipated distorted perception of the situation. Cognitive theorists suggest that suicidal ideation or attempts possess different cognitive styles manifested in cognitive distortions (Beck, 2021). Empirical evidence suggests

that cancer patients possess cognitive rigidity, leading to cognitive distortions, depression, and other psychosocial problems.

To the best of our knowledge, there is no empirical evidence on the moderating role of cognitive distortions in the relationship between depression and suicidal ideation among female breast cancer patients from Pakistan. Suicidal ideation or attempts are always associated with the symptoms of depression. For a decade, there has been indication through literature about the predictive role of cognitive distortions in negative problem orientation leading to depression (Wilson et al., 2011), its relationship to depression, hopelessness, and suicidality (Choon et al., 2015), and role as a mediator between defense mechanisms and depression (Sedat et al., 2016). However, no evidence in this connection is available in the eastern or western literature regarding breast cancer. Breast cancer is on top of the list among all diseases in Pakistan. Therefore, health officials must ponder the current state in this region by implementing empirical work and awareness programs, including psychologists and oncologists. (Arshad et al., 2019).

The present study was carried out to analyze the psychological issues affecting mastectomized breast cancer patients. The objective of this study was to determine the relationship between depression, cognitive distortions, and suicidal ideation in female breast cancer patients. It was aimed to determine the predictive relationships among the study variables and the moderating role of cognitive distortions between depression and suicidal ideation. These psychological factors affect the mastectomised women's recovery; therefore, there was a dire need to fill the gap in knowledge concerning this phenomenon in Pakistani breast cancer patients.

METHOD

The study was conducted after the approval of the Ethical Review Board of COMSATS University, Lahore, with Ref. No. CUI/LHR/HUM/0145 on 15 March 2019.

Participants

To conduct this correlational study, fifty-one female respondents who were breast cancer patients (M_{age} = 45.22, SD = 12.35) were referred from the oncology department's outpatient clinics. Participants were selected through purposive sampling from 3 government hospitals of Lahore, Pakistan, i.e. (1) Jinnah Hospital, Lahore (n=27); (2) Mayo Hospital, Lahore (n=14); (3) Sir Ganga Ram Hospital, Lahore (n=13). The respondents who participated were: (a) The women with stage 3 breast cancer, (b) The women who had undergone a radical mastectomy at least 2 to 6 months before the study, and (c) The women who were on radiation therapy at the time of the survey. The demographic characteristics of participants are reported in table 1.

Table 1. Descriptive Characteristics of Study Variables

Measures	***f (%)***			**Measures**	***M(SD)***
Age (years)	*M(SD)*= 46.55 (11.53)				
Education	Matric=18(35%) Intermediate=7(14%) Graduation=26(51%)			Cognitive Distortion (CD)	41.82(11.43)
Family System	Joint=33(65%) Nuclear=18(35%)			Stressful Thinking (CD)	19.39(6.33)
Marital Status	Single=1(2% Married=48(94%) Divorced=2(4%)			Self-Blame (CD)	8.62(2.48)
Birth Order	First born=9(18%) Middle born=30(59%) Last born=12(24%)			Predictive Thinking (CD)	7.58(2.87)
Economic Status	Low middle=49(96%) Middle= 1(2%) Upper middle=1(2%)			Rigid Thinking (CD).66	6.13(2.58)
Mental illness	Yes= 46(90%) No= 5(10%)			Suicidal Ideation	7.35(.74)
Mental Treatment	Yes= 5(10%) No= 46(90%)			Depressive Symptoms	63.25(29.07)

Note: CD= Cognitive Distortion

Measures

Cognitive Distortions Scale-Urdu

The said instrument is developed for age 18 and above to measure the adult clinical population's self-defeating thinking patterns. It is a 5-point rating scale ranging from 1 "Not at all applicable on me" to 5 "Totally applicable on me." The measure has four subscales, namely: (a) Stress Creating Thinking Style (9-items), which include cognitive distortions of magnification and minimization, discounting the positives, catastrophization, labeling, overgeneralization, selective abstraction, and jumping to a conclusion; (b) Self Blame/Self Criticism (3-items); including the cognitive distortions of should and must, personalization and self-blame;(c) Predictive thinking (3-items) including cognitive distortions of mind reading and future telling; (d) Rigid Thinking include cognitive distortion of emotional reasoning and all or nothing (3-items). Example items are "I think, I overthink about myself" and "I would have never been satisfied with my performance." The scale has 18 items with good internal consistency (a = .87), moderately high temporal stability (r=.86), moderately high split-half reliability (a = .86) and moderately high concurrent validity of the scale ranging from *r* =.44 to .89. (Shakil, & Ali, 2015).

Siddiqui Shah Depression Scale

The scale is a 36 item, culturally appropriate measure of depression developed by Siddiqui Shah in the Urdu language with high reliability and internal

consistency. The test is a 4-point rating scale ranging from 0 (never) to 3 (every time). Among the items, 12 items are mild, 12 for moderate, 12 for severe depression. Example items of the scale are "I have become very hopeless," "I am very unfortunate" and "I have almost lost my appetite." The split-half reliabilities of the scale are r = 0. 79 and r = 0.84, and alpha coefficients for the clinical samples are 0.91 and 0.89, respectively (Shah, 1992).

Beck Scale for Suicidal Ideation (BSSI)

The 19-item self-report scale was developed to determine the presence and current intensity, attitude, behavior, and plans of committing suicide in the past week. The measure is a 3-point Likert scale ranging from 0 (none) to 2 (moderate to strong). The first five items are the exception of the full scale, where a respondent has to answer all questions if the fifth item is responded to positively. If not, the questionnaire is completed at the fourth item on the scale. Example items include "wish to live," "wish to die," and "reasons of living/dying." The scale's total score ranges from 0 to 38, which is taken to analyze the intensity of suicidal ideation (Beck,1988). This study used an Urdu translation of the scale by Nailah Ayub, 2008, with an internal consistency of .75.

Procedures

First of all, permission was taken from the Medical Superintendent of the concerned hospitals to conduct the study. The breast cancer patients (stage III) were accessed after received the concerned oncologist's consent. These patients had already undergone mastectomy at least six months before the study and were currently undergoing post-surgery radiation therapy at the time of the study. Before participating in this research, written consent was taken before the respondents' participation. The participants signed the informed consent, after which they responded to the demographic information form. These demographics included participants' age, education, family structure, marital status, and monthly income. They then responded to the measures, after which the data were analyzed.

Statistical Analysis

IBM-SPSS version 24 was used to carry out the analysis. Categorical variables were calculated in the form of frequencies, mean, and standard deviation through descriptive statistics. The direct and moderated links between study variables were tested in a series of five regression models, which demonstrated the combined and partial moderated effect of cognitive distortions on the relationship between suicidal ideation and depressive symptoms in breast cancer patients. Participants' characteristics, e.g. (age, education, and family income), were controlled as covariates in each regression model. The significance criterion of regression analyses was adjusted using Bonferroni correction (p=.0125). As the study's sample size was comparatively small, we used the bootstrapping method (5000) to derive robust estimates of data's descriptive and inferential characteristics. In each regression model, variables were classified into four steps. Depressive symptoms were regressed onto

demographic characteristics in the first step, followed by suicidal ideation as a predictor, following cognitive distortions (combined as well as subscales) were entered as a moderator in the third step, and the interaction variable (suicidal ideation × cognitive distortions) was included in the last step. The variables determining the main effect were centered before testing in the regression models, as suggested by Holmbeck (2002). Further, following Holmbeck's (1997) guidelines, a significant interaction was found after controlling the main effect, which depicted the moderating impact at different levels. Lastly, the significant direct and indirect moderated links were interpreted by plotting the simple regression lines (+ 1=SD & Mean).

RESULTS

Correlation Analysis

Table 2 shows significant positive correlations of cognitive distortions with suicidal ideation and depressive symptoms ranging from mild to moderate at alpha levels of 0.05, 0.01, and 0.001. A significant positive association of suicidal ideation was observed with depression (*r*= .43***) and cognitive distortions. Furthermore, depression was observed significantly positively lined with all cognition distortions.

Table 2. Correlations between Cognitive Distortions, Suicidal Ideation, and Depressive Symptoms

Measures	Depression	Cognitive Distortions				Cognitive Distortion
		Stressful Thinking	Self-Blame/ Self-Criticism	Predictive Thinking	Rigid Thinking	
Suicidal Ideation	.43***	.301**	.299*	.312**	.141*	.348*
Depression		.453***	.380**	.365**	.300**	.484***

Note: **p<.05, **p<.01, ***p<.001*

Moderation Analyses

Stressful thinking as moderator: The first regression model tested the link between suicidal ideation and depressive symptoms due to stressful thinking (cognitive distortion). As reported in table 3, after controlling for the significant effects of demographics in the first step, which explained 10% of the variance, suicidal ideation was entered in the second step, which added only 1% variable to the model (incremental R=.01). Besides, all three demographic variables were significant predictors of depressive symptoms. Next, stressful thinking is entered in the third step. The analysis showed stressful thinking as significant predictors, which explained 23% of the variance, adding 12% unique variance (incremental R=.12) to the model. In the last step, the interaction term is added in the model, which explained the 21% total variance with a decrease of 2% in the model (incremental R=.02). The interaction term did not moderate the link of suicidal ideation with depressive symptoms. Stressful thinking serves and a resource factor (direct effect) but did not affect the association's strength

between suicidal ideation and depressive symptoms. As the first two steps of every regression model present similar finding, therefore reported only in the first model and skipped for others.

Self-Blame/ Self-Criticism as Moderator: The second model tested the assumption that the link between suicidal ideation and depressive symptoms would vary as a function of self-blame/ self-criticism even after controlling for demographic characteristics. In the third step, the analysis demonstrated a significant direct effect of self-blame on depressive symptoms and explained 18% variance adding 7% unique variance to the model (incremental R=.07). A significant interaction between suicidal ideation and self-blame was found to regress the depressive symptoms by adding a 5% variance of the regression model. Figure. One illustrates moderated relationships at low, moderate, and high levels. The relationship of suicidal ideation was more significant and more influential with depressive symptoms at a high level of self-blame followed by a moderate level (β=3.80, p<.05). At a low level, self-blame played no significant role.

Predictive Thinking as Moderator: The Third regression model tested the moderated contribution of predictive thinking in linking suicidal ideation and depressive symptoms. In step 3, predictive thinking significantly contributed to depressive symptoms and explained 17% variance, adding 6% of the moderation model's unique variation. At the last step of interaction between suicidal ideation and predictive thinking, Significant results explained 23% variance (incremental R= 6%). Figure 2 depicts an exciting interaction effect. Like model 3, the link between suicidal ideation and depressive symptoms was strong at the high level of predictive thinking, followed by a moderate relationship at an average level. Whereas, at low levels of suicidal ideation, the link between predictive thinking and depressive symptoms was more significant than medium and light levels of suicidal ideation.

***Rigid Thinking as Moderator*:** The fourth model tested the link between suicidal ideation and depressive symptoms as a function of rigid thinking. When entered rigid thinking in the model, the third step explained 16% of variance as a significant predictor and added 5% of the regression model's unique difference. When the interaction term was entered into the model at the last step, no significant contribution was seen, and the total variance was reduced to 14% (incremental R=.02).

***Cognitive Distortions as Moderator*:** The last model tested that cognitive distortion as a composite component moderate the link between suicidal ideation and depressive symptoms, even controlling for demographic variables. In step three, cognitive distortions illustrated a significant main effect, explaining a 25% variance with 14% unique difference, adding to a total regression model. No significant interactive effect was found at variance reduced to 24% in the last step, explaining only 1% of the moderation model's unique difference.

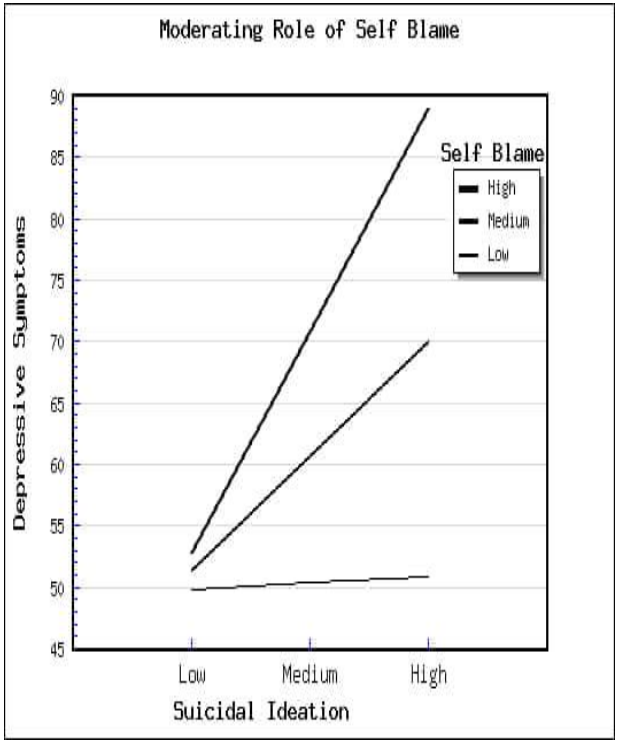

Figure 1: Self- Blame moderating the link between suicidal ideation and depressive symptoms

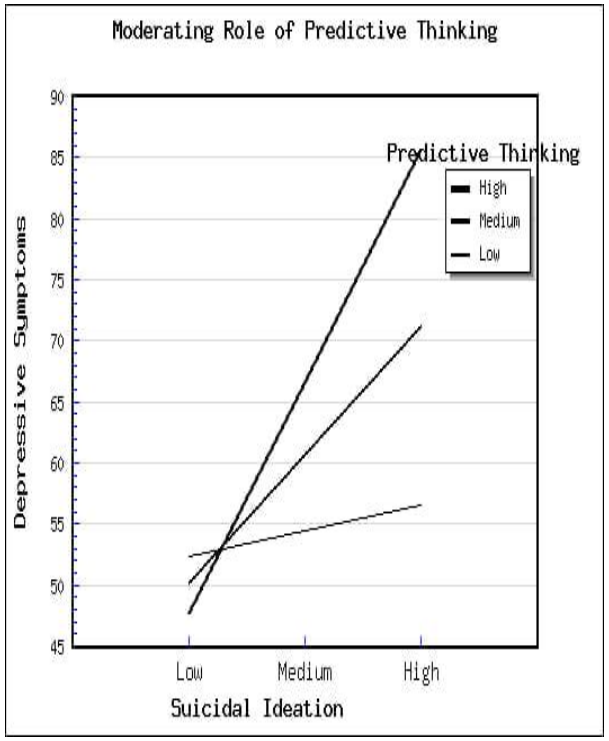

Figure 2: Predictive Thinking moderating the link between suicidal ideation and depressive symptoms

Table 3. Standardized Regression Weights of Direct and Moderated Links between Suicidal Ideation, Cognitive Distortion, and Depressive Symptoms.

Measures	**Stressful Thinking**				**Self-Blame/ Self-Criticism**				**Predictive Thinking**			
	Step 1	**Step 2**	**Step 3**	**Step 4**	**Step 1**	**Step 2**	**Step 3**	**Step 4**	**Step 1**	**Step 2**	**Step 3**	**Step 4**
Age	-.70***	-.64**	-.60**	-.59	-.70***	-.64**	-.60**	-.59	-.70***	-.64**	-.60**	-.59
Education	.34*	.30	.27	.27	.34*	.30	.27	.27	.34*	.30	.27	.27
Monthly Income	-.43**	-.40**	-.38	-.38	-.43**	-.40**	-.38	-.38	-.43**	-.40**	-.38	-.38
Suicidal Ideation (P)		..36*	.24*	.12		.36*	.27*	.30*		..36*	.27	-.40
Moderator (M)			.36**	-.07			.30*	-2.66			.28*	-2.68*
Interaction (P×M)				.50				**3.80***				**3.25***
R^2	.09	.12	.26	.26	.09	.12	.21	.27	.09	.12	.20	.28
ΔR^2	.10	.11	.23	.21	.10	.11	.18	23	.10	.11	.17	.23
Incremental R		.01	.12	.02	-	.01	.07	.05	-	.01	.06	.05
Model Fit	F=6.79**	F=7.22**	F=8.48**	F=5.55*	F=6.79**	F=7.22**	F=6.38	F=5.87*	F=6.79**	F=7.22**	F=5.98*	F=5.97*
	Rigid Thinking				**Cognitive Distortions**							
	Step 1	**Step 2**	**Step 3**	**Step 4**	**Step 1**	**Step 2**	**Step 3**	**Step 4**				
Age	-.70***	-.64**	-.60**	-.59	-.70***	-.64**	-.60**	-.59				
Education	.34*	.30	.27	.27	.34*	.30	.27	.27				
Monthly Income	-.43**	-.40**	-.38	-.38	-.43**	-.40**	-.38	-.38				
Suicidal Ideation (P)		.36*	.32*	.37		.36*	.27	-.08				

Moderator (M)			.26*	.32			.41**	-.54
Interaction (P×M)				-.06				1.10
R^2	.09	.12	.19	.19	.09	.12	.28	.29
ΔR^2	.10	.11	.16	.14	.10	.11	.25	.24
Incremental R		.01	.05	.02	-	.01	.14	.01
Model Fit	F=6.79**	F=7.22*	F=5.70*	F=3.72**	F=6.79**	F=7.22*	F=9.12***	F=6.23**

Note: *p<.05, **p<.01, ***p<.001

DISCUSSION

This study suggests that stressful thinking predicts depression and suicidal ideation and is a resource factor in mastectomized breast cancer patients. The relationship of suicidal ideation was also more significant and more influential with depressive symptoms at a high level of self-blame. The link between suicidal ideation and depressive symptoms was strong at the highest level of predictive thinking. Whereas, at a low level of suicidal ideation, the connection between predictive thinking and depressive symptoms was more significant than moderate and high levels of suicidal ideation. Therefore, Cognitive distortions were overall found to moderate the relationship between depression and suicidal ideation. These results confirm the assumption derived from the cognitive theory that depression symptoms and suicidal ideation of a cancer patient depending on how she perceives and interpret her situation. The theory asserts that faulty thinking leads to depression, and women with breast cancer develop depression because they perceive and interpret their situations negatively. This pessimism leads to biased interpretations of events and situations, thereby leading to negative schemas. Due to these negative schemas, the patients relate unfavorable aspects to their illnesses and survival. This distortion of the information often involves systematic cognitive errors called cognitive distortions (Moorey & Greer, 2006).

Women with breast cancer who undergo mastectomy may develop depression because of losing their sense of femininity, mourning, and worry about losing their husbands' affection after surgery (Arshad, & Muazzam, 2016; Ejaz et al 2021; Khawar et al, 2021). Cognitive restructuring of such beliefs is helpful to reduce the negative emotions attached to them, thereby reducing depression and suicidal ideation (Asuzu et al., 2015). Literature suggests that cognitive distortions in cancer patients are the main reason for their psychological distress (Zhang et al., 2017), with a strong significant relationship of dysfunctional attitudes with stress and depression (Amir et al., 2015). Understanding cognitive distortions are crucial to predict health behaviors in individuals with chronic medical illnesses (Stankiewicz, 2008). Breast cancer worry is a cognitive variable in females with breast cancer who seek healthy behaviors. However, limited literature is available on the presence of specific cognitive distortions

in this population (Molina et al., 2014). A study finding suggests that a few cognitive distortions, i.e., fortune-telling, minimization, and magnification, predict non-compliance to medical advice and health behaviors in women with breast cancer (Amanda, 2016).

Breast cancer patients can adapt to their diagnosis and treatment with the help of psychological intervention. To cope with the disease, the client's affective state, and control of psychological symptoms, cognitive-behavioral techniques are helpful (Cobeanu & David, 2018). Cognitive behavior therapy (CBT) comprises cognitive and behavior change techniques that target dysfunctional thoughts and beliefs. Literature suggests that CBT is associated with clinically significant improvement in cancer patients' mood and quality of life (Garland et al., 2014). Cognitive behavior therapy in the group also increases optimism, personal growth, and emotional well-being in women who survive breast cancer (Stagl et al., 2015). This intervention has proved to be very useful in all types of cancer (Barrera et al., 2017).

CONCLUSION

Thus, to conclude, the crucial part of a cancer patient's treatment and recovery is the diagnosis of associated psychological factors such as their cognitions. Insight about a patient's negative cognitions can help reduce depression and better cope with the disease and suicidal thoughts. Moreover, the sufferer's reaction or adjustment to the illness results from the interaction between the disease's schemas and the produced automatic thoughts. Recognition of this negative cognitive triad involving the sickness, control, and prognosis is essential in providing a psychological intervention that requires cognitive restructuring. In our region, the importance of psycho-oncologist is not yet recognized. There should be oncologists and psycho-oncologist working in coordination with each other in different oncology clinics and departments. We believe that medical and psychological treatment will be effective for cancer patients only if the health psychologists and oncologists work as a team.

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Disclosure Statement

The authors declare that they have no Conflict of Interest to declare.

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