

Survivorship in young women after early breast cancer: a cross-sectional study of emotional traits along 3-years perspective

La sopravvivenza nelle giovani donne con diagnosi di cancro al seno precoce: studio cross-sectional dei tratti emotivi in una prospettiva a tre anni

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SUMMARY. Background. Breast cancer diagnosis and treatments have a strong impact on women's lives. This study aimed to evaluate the changes in emotional traits in women aged 38-50 years over a three-year period. **Method.** By cross-sectional study design, a sample of n. 126 patients in range age 38-50 has been recruited in different timing of cancer disease, in order to evaluate the patients' emotional traits (variables: anxiety, anger, psychological distress, and depression) at the time of diagnosis, and 6, 12, 18, 24, and 36 months after diagnosis. Anger, anxiety, psychological distress, and depression were evaluated. **Results.** Results showed significant differences in each emotional variable during treatment. Anxiety showed a decreasing trend, whereas anger tended to improve significantly. At 12 and 24 months from the diagnosis, patients seemed more aware about their own psychological needs compared with the period immediately after the diagnosis (T0) and during the treatments. Women who had recently received a diagnosis (T0) seemed more resilient in their responses in facing an emergency. **Conclusions.** Increased survival rate after breast cancer diagnosis is strongly linked to the management of emotional weakness of BC women because of modified living. Patients need to be supported to regain their life after clinical treatments though tailored psychological treatment along survivorship, not only in primary treatment.

KEY WORDS: breast cancer post-treatments, psychological distress, depression, TNM cancer stage, survivorship.

RIASSUNTO. Introduzione. La diagnosi di cancro al seno e i relativi trattamenti hanno un importante impatto emotivo sulla vita delle donne. Il presente studio ha l'obiettivo di valutare i cambiamenti nei tratti emotivi delle donne in età compresa tra i 38 e i 50 anni in un periodo di 3 anni. **Metodo.** Un campione di n.126 pazienti di età compresa tra i 38 e i 50 anni è stato reclutato in uno studio cross-sectional in differenti tempi dalla diagnosi al fine di valutare il cambiamento dei tratti emotivi al momento della diagnosi, a 6, 12, 18, 24 e 36 mesi dopo la diagnosi. Sono state valutate: rabbia, ansia, distress psicologico e depressione. **Risultati.** I risultati hanno evidenziato differenze significative in ciascuna variabile emotiva durante il trattamento. L'ansia è apparsa in un trend di decrescita, mentre la rabbia è apparsa aumentare significativamente. A 12 e 24 mesi dalla diagnosi, i pazienti tendono a essere più consapevoli dei propri bisogni psicologici rispetto al periodo immediatamente dopo la diagnosi (T0) e durante i trattamenti primari. Le donne che hanno ricevuto la diagnosi da poco tempo (T0) sembrano essere più resilienti nelle loro risposte in fase di emergenza. **Conclusioni.** L'incremento del rate di sopravvivenza a seguito di diagnosi di cancro al seno è fortemente associato alla fragilità della gestione delle emozioni nelle pazienti a seguito della modificata qualità di vita. Appare necessario il supporto dei bisogni dei pazienti finalizzato al ritorno nella vita quotidiana anche dopo gli interventi clinici attraverso trattamenti psicologici specifici, e non solo durante le cure primarie.

PAROLE CHIAVE: trattamento post-diagnosi cancro al seno, distress psicologico, depressione, TNM stadiazione del cancro, survivorship.

INTRODUCTION

Breast cancer (BC) diagnosis has a strong impact on the quality of life of women, especially on their emotional state. Several studies have showed the negative impact of BC on affective relationships, sociality, work performance, family

management, and personal expectations for life¹⁻⁸. Patients with BC confront many stressors; the cancer experience can be distressing and disruptive, not only at the time of diagnosis but also along the entire clinical path. Parikh et al.⁹ indicated the following common symptoms after BC diagnosis: fatigue, sexual problems, cognitive dysfunction, fear of recur-

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rence, intrusive thoughts on illness/persistent anxiety, issues in marital/partner communication on feelings of vulnerability, and existential concerns regarding mortality. Gibbons et al.⁴ identified illness perceptions and coping as significant variables in psychological distress after cancer diagnosis. Women can be impacted differently by the experience of BC, and these differences are influenced by social factors but also affected more by personality traits and the patients' own identity. Gibbons et al.⁴ further suggested identity as a consistent predictor for adjustment; in this process, coping strategies for emotional adjustment can push the reaction to the traumatic diagnosis in that «higher levels of fighting spirit predicted less depression» [p. 7].

The common feature of these studies is the investigated population. Studies have tended to be conducted with older patients (>50 years old), as BC incidence increases with age. Few studies have focused on a younger population in evaluating the influence of BC diagnosis during medical treatment^{10,11} because the frequency of BC is lower in younger age groups. However, the incidence rate for BC diagnoses is increasing owing to the implementation of national screening policies as a preventive intervention to increase the number of BC survivors. Indeed, early screening has enhanced the early diagnosis of illness in younger women (>50 years), which engenders the positive outcome of increased survival rates. In a sense, medical success has created new challenges. There is growing recognition that cancer treatments affect many patients not only mentally and physically but also socio-economically.

According to the five-year observational cohort study of Burgess et al.¹², the negative life perspective after BC diagnosis is slowly turning, given the increased chances at positive outcomes associated with the higher survival rates over time; the dissemination and communication style of involved professionals seem to be the essential starting point to boost the awareness of improved outcomes. Further, Burgess et al.¹² reported that the quality of social support can be an effective predictor of better health and quality of life. However, the positive medical perspective of increased survivor rates is not informed by findings on good quality-of-life levels. Patients have highlighted the need to be helped to elaborate their experience, overtake the stress of the illness, and overcome mental disadvantages. Women patients, especially younger patients, complain of the need to change their life's vision, but they are not able to do this alone; they need professional help. They tend to experience lower quality-of-life levels compared with older patients in the short and long term, with increased treatment intrusiveness contributing to their psychological fragility¹³⁻¹⁵. BC diagnosis in a younger age assumes the meaning of an unexpected shift in one's life trajectory, and frequently an isolated one, for those without peers with BC. Ruddy et al.¹⁵ highlighted that compared to older women, young BC survivors are typically more concerned with appearance, becoming more sexually active, and involvement in parental relationship with children. Hubbeling et al.¹⁶ suggested that the transition to survivorship can be a period of elevated psychological distress even better in a +5 years perspectives, and demanding psychological care. Mollica e Nemeth¹⁷ argued that the post-primary treatment after BC diagnosis is a time filled with stress and loss of one's safety net requiring significant coping strategies. Patients have expressed the need to have support even after receiving primary care for their illness.

Molina et al.¹⁸ highlighted the clinical relevance of psychological resilience in complex clinical treatments (e.g., surgery and/or pharmacological intervention), evincing the positive impact of confronting emotional distress and returning to normal life. Quattropani et al.⁸ demonstrated the role of negative belief as a predictor of anxiety and psychological distress in patients undergoing chemotherapy. They showed the association between metacognitions and emotional distress, verifying negative belief, in particular, as predictors for negative anxiety, depression, and overall distress⁸. Despite great interest in the psychological impact of BC diagnosis and treatment, the findings are not exhaustive because most investigations are conducted during the inpatient condition. The period when patients return to their daily life, to work, to their own habits, and into their social and affective community needs to be examined in-depth to boost the quality of life of patients after their traumatic experience of cancer diagnosis and treatments.

The present study aimed to evaluate the trend for emotional traits in screened younger women (aged 38-50 years) over a longer period (three years), starting from the time of diagnosis. We intended to analyze the psychological conditions of women after hospitalization, from an observational perspective, over 36 months, involving different patients in five phases of their clinical path. Employing a cross-sectional study design, our objective was to analyze depression, anxiety, anger, and signs of psychological distress among Italian women with BC over a period of 36 months, and their associations at baseline, and at 6, 12, 18, 24, and 36 months after diagnosis, to evaluate the impact of cancer diagnosis and the psychological resilience of younger women to deal with the related complex clinical path: by cross-sectional study we wanted to investigate the risk of prevalence of emotional fragility in survivorship. We hypothesized that women, from the time of diagnosis, undergo different emotional reactions dealing with daily life, which, when sustained for a long time (from the time of diagnosis), might be symptomatic of fragility.

METHODS

Ethical approval

This study was approved by the Institutional Review Board of the University of L'Aquila, Italy (Prot. No. 15855/2015), and by S. Salvatore Hospital, L'Aquila (IT), from which participants were recruited.

Participants

Eligible participants were women aged 38-50 years (mean age 44.3 years, SD±6.2) living in central Italy diagnosed with BC. Exclusion criteria were recurrent or metastatic cancer, premorbid depression and/or anxiety, and alcohol or substance abuse. The participants were approached to participate in the study at the Medical Oncology Division of S. Salvatore Hospital in L'Aquila (Italy).

We contacted 148 eligible patients, of whom 126 provided informed consent. Thirteen patients did not consent to participate in the experimental protocol, whereas nine patients signed the informed consent form, but at the first session, they declined further

involvement (dropped out). The reasons provided for nonparticipation were disinterest in participating in the research (41.3%) and time constraints (29.8%). The demographic characteristics of the participants are presented in Table 1.

The participants were eligible to enroll in the study if they had a BC diagnosis and followed a clinical path within the set time periods: within 1 month after diagnosis (T0), and 6 months (T1), 12 months (T2), 18 months (T3), 24 months (T4), and 36 months (T5) following diagnosis, and after surgical intervention and/or treatment with adjuvant chemotherapy, radiation therapy, or both, for stages 0-III cancer. No one was forced into any psychological intervention/support.

Inclusion criteria were as follows: a) 35-50 years old, b) female, c) no recurrence (i.e., second primary diagnosis); and d) diagnosis of BC had been in the last 6 to 36 months.

Figure 1 presents a flow chart for the selection of all participants.

Procedure

Medical staff in the oncological division identified eligible patients, who were then enrolled during subsequent scheduled appointments by medical protocol. Informed consent was obtained at the time of enrolment. Trained clinical psychologists, blinded to the objectives of the study, conducted the psychological evaluations in a quiet, dedicated room. The evaluations lasted 40 minutes. Participants completed the measures during their scheduled follow-up appointments. Data were collected anonymously. All participants have been recruited in specific timing of disease covering a range of disease 1-36 months from the diagnosis in order to process a cross-sectional data in time series analysis.

Sociodemographic variables

Two types of participant information were collected. First, demographic data were collected via the self-reports of the participants; we selected independent variables for inclusion in the analyses if they were characteristic of the age/life stage (e.g., having children, being employed, and marital status) related to the cancer. Second, clinical data were obtained from the participants' medical records regarding BC stage, treatments, and therapies.

Cancer staging system

The TNM Classification of Malignant Tumours¹⁹, a cancer staging system developed by the American Joint Committee on Cancer and Union for International Cancer Control, was applied to classify the cancer stage of the participants. The TNM system is based on four main factors: a) location of the primary tumor, b) size and extent of tumors, c) lymph node involvement, and d) presence or absence of distant metastasis. The TNM system has the following stages: X (primary tumor cannot be evaluated), 0 (no evidence of primary tumor), carcinoma in situ (early cancer that has not spread to neighboring tissue), 1-4 (size and/or extent of the primary tumor). This cancer staging system was applied by the clinical staff; data were obtained from participants' records.

Psychological tests

The experimental psychological battery was composed of self-reports evaluating the four emotional variables of anger, anxiety, psychological distress, and depression. The participants filled out the tests after the individual clinical interview session. The psychological tests used were the State Trait Anger Expression Inventory (STAXI-2) to measure anger, State Trait Anxiety Inventory form Y (STAI-Y) to evaluate anxiety, Psychological Distress Inventory (PDI) to assess distress, and Beck Depression Inventory version 2 (BDI-II) to detect depression. We applied the Italian population version of these tests; we reported the reliability data.

State-Trait Anger Expression Inventory-2 (STAXI-2)²⁰. This self-administrated questionnaire measures emotional states and personality traits; in particular, it evaluates the experience, expression, and control of anger. The STAXI-2 items are categorized into six scales: five subscales and an expression index. The experience of anger is conceptualized as having two components: State Anger (S-Ang) and Trait Anger (T-Ang). S-Ang is considered to be situational and refers to the level of anger that one experiences during the assessment. T-Ang is defined as a predisposition to experiencing anger. The expression and control of anger are conceptualized as having four components: Anger Expression-Out (AX-O), Anger Expression-In (AX-I), Anger Control-Out (AC-O), and Anger Expression Index (AX Index), which provides an overall estimation of the anger expression and control scales. The scoring indicates the different personality traits involved in anger risk. The internal reliability was $\alpha=0.83$ for the patient group and $\alpha=0.61$ for the control group.

State-Trait Anxiety Inventory-Form Y (STAI-Y)²¹. This 40-item self-report test measures state and trait anxiety. Scoring is based on standard procedure. The internal reliability was $\alpha=0.62$ for the patient group and $\alpha=0.73$ for the control group.

Psychological Distress Inventory (PDI)²². This self-administrated questionnaire measures the impact of psychological distress

Table 1. Demographic characteristics of the sample.

Age, years	Range 38-50 years (mean age 44.3 years, SD ± 6.2)
Relationship status	
Married/living with partner	75.6%
Single	17.4%
Divorced/widows	7.0%
Education	
Less than high school	14.0%
High school	58.1%
More than high school	25.6%
Occupation	
Housewife	27.9%
Employed	53.5%
Self-employed	17.4%
TNM cancer stage	
0	4.7%
I	47.7%
II	23.3%
III	18.6%
Treatments*	
Mastectomy	40.7%
Lumpectomy	59.3%
Chemotherapy	16.3%
Radiation therapy	2.3%
Hormonal therapy	73.3%

*Not mutually exclusive

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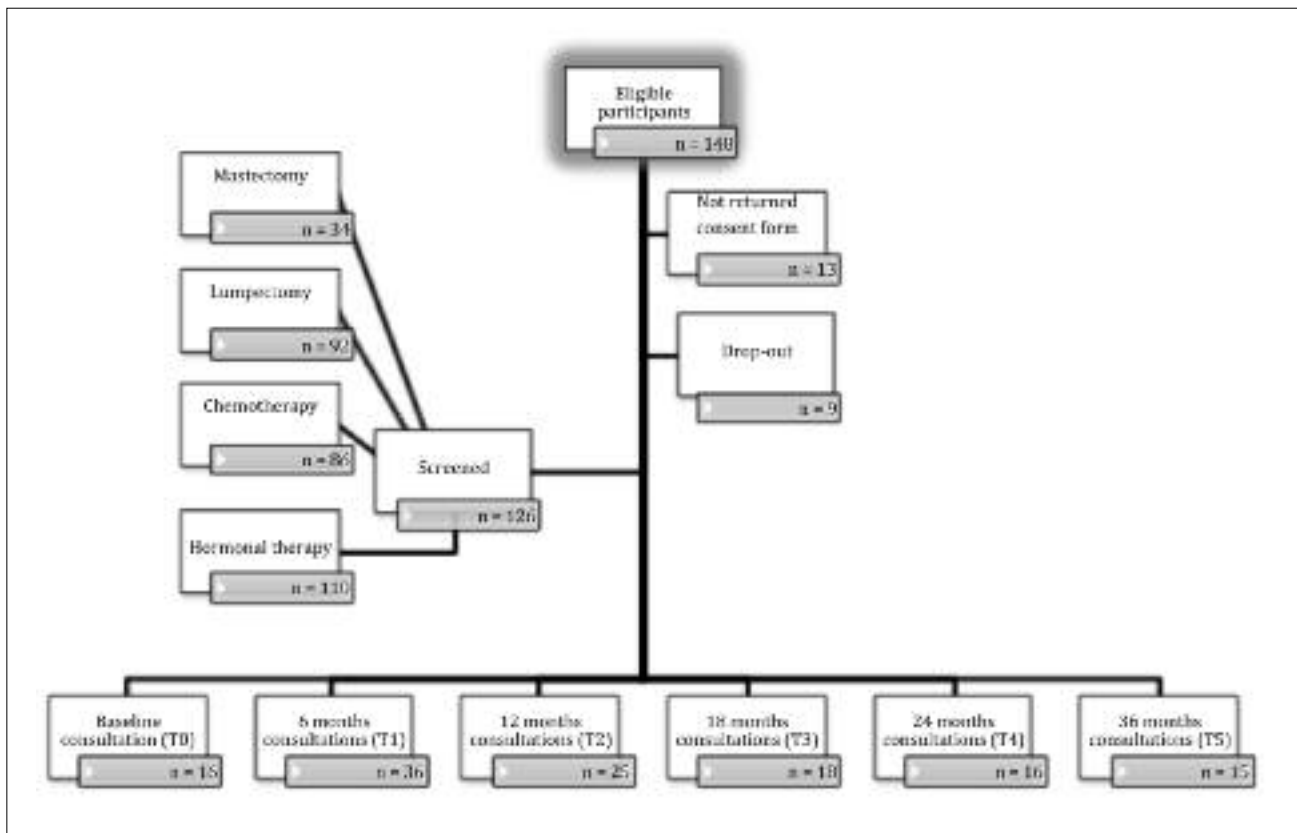


Figure 1. Number of participants throughout the study.

and related therapies. It is composed of 13 questions, and responses are indicated on a five-point Likert-type scale. The standard score estimates the presence/absence of psychological distress to measure global distress. This test was administered only to the participant group. The inventory demonstrated good reliability ($\alpha=0.86$).

*Beck Depression Inventory-II (BDI-II)*²³. This 21-item self-administered test assesses the intensity of depression in clinical and non-clinical populations. Each item is a list of four statements arranged in increasing severity about a particular symptom of depression. The scores indicate the presence/absence and related degree of depression (from minimal to severe depression sign). The internal reliability was good for both the participant ($\alpha=0.81$) and control ($\alpha=0.76$) groups.

Study design

We conducted a three-year longitudinal study to evaluate the prevalence of psychological traits within a young BC population. Data were collected at six time points following the initial BC diagnosis: baseline (T0, 1 month), T1 (6 months), T2 (12 months), T3 (18 months), T4 (24 months), and T5 (36 months). Descriptive statistics for baseline characteristics and outcome measures at each time point were calculated. A one-way ANOVA (followed by

Duncan post-hoc analyses) was conducted to detect the statistical significance of the overall differences across the psychological variables. A MANOVA was performed to calculate the significant difference by stage of disease and age. Data analyses were performed using SPSS, with a fixed α value of ≤ 0.05 .

RESULTS

Overall, 85% (126 of 148) of eligible women completed the psychological evaluations in the different time points of the study (T0, T1, T2, T3, T4, T5); 13 women declined to participate (no returned consent form), whereas 9 women dropped out after signing a consent form (did not complete any time point of the study). The means (and standard deviations) of the raw scores are reported in Table 2.

First, our statistical analyses were focused on the emotional experience of patients in the time period after BC diagnosis. A one-way ANOVA was conducted to compare the patients' emotional status. The participants were divided into six subgroups according to the time points after diagnosis: T0 (baseline), T1 (6 months), T2 (12 months), T3 (18 months), T4 (24 months), and T5 (36 months); the time points

Table 2. Raw scores on the psychological testing distributed by timing (*) from the diagnosis.

Patient groups	N°	Psychological tests								
		STAXI						STAI	BDI	PDI
		S-Ang	T-Anger	AX-IN	AX-OUT	AC-O	AX Index			
1 month*	16	16.1 (± 7.2)	19.0 (± 4.4)	14.0 (± 3.3)	19.1 (± 3.9)	20.1 (± 3.9)	28.2 (± 7.4)	90.1 (± 7.2)	11.0 (± 9.7)	28.1 (± 8.8)
6 months*	28	14.4 (± 5.8)	17.5 (± 4.1)	15.4 (± 3.5)	19.2 (± 3.5)	23.2 (± 3.7)	27.3 (± 7.0)	86.6 (± 9.3)	10.1 (± 8.7)	31.1 (± 11.2)
12 months*	29	12.2 (± 3.2)	17.8 (± 3.7)	14.6 (± 3.8)	18.5 (± 2.9)	21.2 (± 4.2)	28.3 (± 6.5)	87.6 (± 6.9)	9.2 (± 6.8)	28.1 (± 8.3)
18 months*	17	13.8 (± 4.6)	18.2 (± 4.5)	13.8 (± 2.9)	18.5 (± 4.2)	21.5 (± 5.3)	26.9 (± 8.4)	88.9 (± 7.0)	9.7 (± 5.8)	29.4 (± 7.7)
24 months*	19	11.3 (± 1.9)	17.8 (± 5.0)	13.5 (± 4.8)	18.8 (± 3.9)	21.8 (± 4.2)	27.1 (± 8.4)	88.0 (± 7.1)	9.9 (± 5.4)	26.5 (± 6.2)
36 months*	17	13.1 (± 4.5)	20.5 (± 4.0)	12.4 (± 2.8)	20.1 (± 4.5)	19.5 (± 4.7)	29.0 (± 8.0)	89.8 (± 5.3)	9.7 (± 7.4)	30.1 (± 8.4)
Sample	126	13.4 (± 4.9)	18.3 (± 4.3)	14.1 (± 3.7)	19.0 (± 3.7)	21.4 (± 4.4)	27.8 (± 7.4)	88.2 (± 7.3)	11.0 (± 9.7)	28.1 (± 8.8)

were representative of scheduled medical check-ups. Emotional condition was detected by four measures: STAI-Y, PDI, BDI-II, and STAXI-2 (composed of four components: S-Ang, AX/O, AC-O, and AX Index). The statistical analysis showed a significant difference in S-Ang measures between time points ($F(5,120)=2.51$; $p>0.03$) and post hoc analysis (Duncan test) indicated lower scores at T2 ($p>0.02$) and T4 ($p>0.004$).

No significant effect on emotional status was detected according to age group (four subgroups: >40 years old, 41-45 years old, 46-49 years old, and ≥ 50 years old) or TNM staging label (four levels), which were evaluated separately.

Next, a MANOVA ($4 \times 6 \times 4$) was conducted comparing TNM stage (four levels), time point after diagnosis (six levels), and the emotional variables (four measures). The analysis showed significant effects in some of the examined emotions (Figure 2).

Particularly, the results indicated the impact of S-Ang ($F(4, 18.98)=3.59$; $p>0.001$) AC-O ($F(4, 18.98)=5.79$; $p>0.02$), and STAI-Y ($F(4, 18.98)=1.86$; $p>0.02$). The post-hoc analysis (LSD test) highlighted the following results. *S-Ang*: Lower scores denoted positive outcomes. Participants in TNM Stage 1 showed lower levels of state anger at T2 ($p<0.01$) and T4 ($p<0.01$). Moreover, for patients in TNM Stage 2, S-Ang was significantly higher at T2 ($p<0.03$) and T4 ($p<0.01$). *AC-O*: Lower scores signified negative outcomes. The anger of participants in TNM Stage 1 at T5 ($p<0.03$) was high, as well as for participants in TNM Stage 2 at T0 ($p<0.04$) and T5 ($p<0.03$). *STAI-Y*: Higher scores denoted negative outcomes. Participants in TNM Stage 1 at T5 ($p<0.02$) showed higher levels of anxiety, as did patients in TNM Stages 2 and 3 at T1 ($p<0.04$ for both groups).

No significant effects were detected regarding psychological distress (PDI) and depression (BDI-II): the trends for both emotional variables remained at the same level for the three years following diagnosis. Moreover, an analysis of the raw scores revealed emotional weakness, but no pathological emotional impact. In clinical practice, this outcome is a

strong psychological feature because it is basic to resilience pattern.

DISCUSSION AND CONCLUSIONS

This study investigated the emotional traits along survivorship after BC diagnosis from a three-year perspective of the disease. Focus target was young patients in early stage of cancer. Our purpose was to examine trends of emotional traits after undergoing medical treatments for BC.

Overall, our data highlighted a good adjustment to having the illness. The participants showed a strong ability to manage through emotional regulation and flexibility, with the women dealing energetically with the different steps involved in the clinical settings, surgery, and then pharmacological treatments. Over the three years following diagnosis, the time points that were most strongly impacted were around the 12th month after diagnosis and the range from months 24 to 36. The emergence of anger one year immediately after diagnosis and shortly after the main clinical intervention can be considered as a beneficial emotional trait to combat fragility (low level of emotional regulation evidencing anger, anxiety, and depression, such as psychological distress) and avoid the onset of psychopathological symptoms (depression). Then, the recurrence of anger two and three years after diagnosis signifies a reaction to mental distress and resilience in the face of fear of disease recurrence. BC women with a high level of psychological resilience were able to face and cope with their own diseases correctly and were able to adjust and recover their own physical and mental health. According to Dooley et al.²⁴, the potential to survive in adversity for most individual increases with age, so their psychological resilience scores will be higher. In BC medical pathway, the clinical stage of cancer determines the surgical method, courses of adjuvant therapy, and our finding showed the emotional state in young patients; women with early diagnosis of BC may experience less stress, less surgical trauma and have greater ability for physical and mental re-

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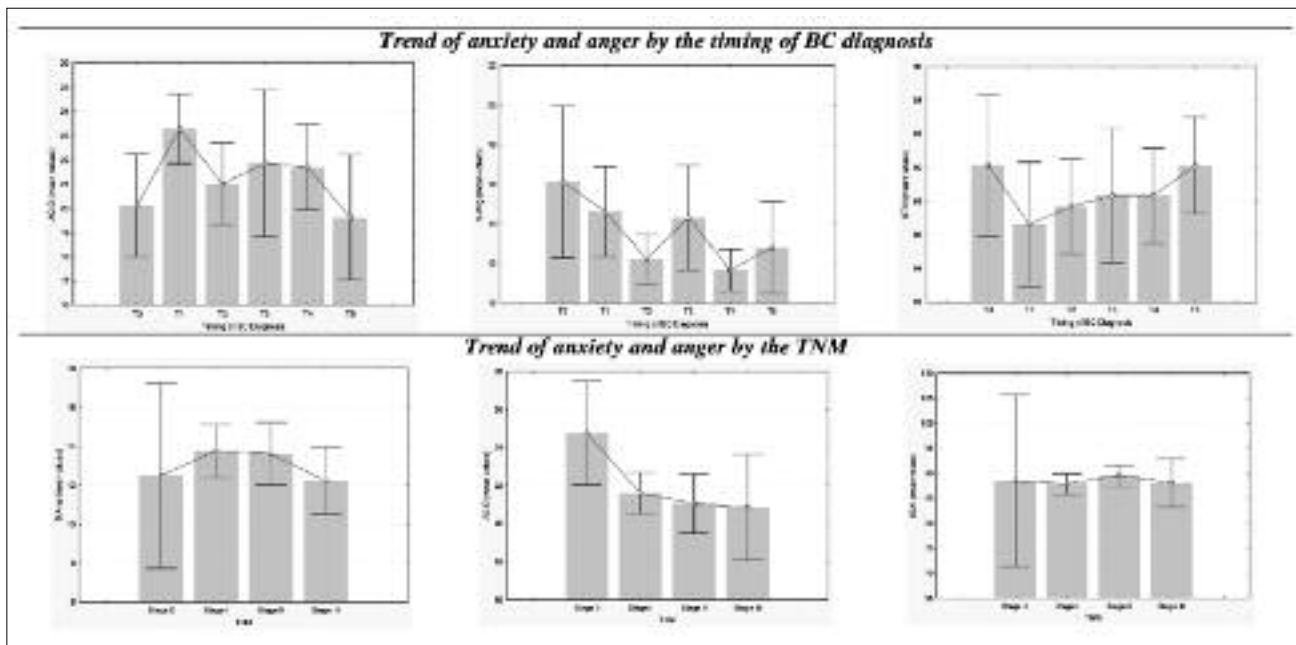


Figure 2. Representation of emotional trends in three years of perspective of breast cancer.

covering after primary treatment. After BC diagnosis and treatment in the early stage, the postoperative self-repair ability appeared stronger, more into positive outcome. According to Seiler and Jenewein review²⁵, the cancer experience is associated with positive and negative life changes, and psychological resilience can make the difference; by theory proposed by Tedeschi and Calhoun²⁶, the posttraumatic growth approach (PTG) should be a critical component of cancer care promoting resilience. The PTG approach sustains cancer patients being forced to cope with a potentially life-threatening disease, can cause enough stress that someone begins to critically scrutinize his or her place in it in the world and overall worldview. This approach assumes that the disruption and distress caused by the trauma trigger cognitive processing and restructuring of the event (post-trauma processing), resulting in new insights and revised beliefs to reflect the person's new reality. Our finding can be supportive of positive roles of psychological resilience and PTG approach in survivorship; more, tailored psychological interventions can improve the positive outcome offering mental service in fixed timing of survivorship, not only in primary intervention (early time after BC diagnosis) but also and in post treatments timing along survivorship. In fact, in clinical practice, fear is frequently reported by patients during scheduled appointments along survivorship. Patients' negative thoughts on the future increase their health risks and affect their life, leading to a low rate of adherence to the scheduled appointments, instead of a healthy lifestyle and practice of reducing risk factors in one's daily life.

Several studies have detected negative psychological impacts in older women, expressed as depression, anxiety, and personality disorders^{1,2,6}. Costanzo et al.³ examined the adjustment to life after treatment and detected a controversial outcome. They reported that physical problems related to

cancer can be influential as a source of distress; however, shortly after BC diagnosis, the authors reported a good quality of life following clinical treatments, even though "getting back to normal life" was stressful because it meant "creating a new normal". These encouraging findings focused on emotional patterns in older patients (>55 years old). Our research showed a different trend for emotional regulation in younger patients; our findings had been focused on younger patients (<50 years old) and highlighted a higher ability to fight the fear of cancer and its impact, which facilitates positive mental adjustment. We found resilience to be a secondary effect. From the participants' clinical feedback, the factors influencing emotional regulation can be determined as follows: a) active work, b) mental projection of the future (i.e., things to realize/do for oneself), c) daily active involvement in family life with young children, and d) having a life-long perspective. According to Mens et al.²⁷, coping strategies can work efficiently in patients with BC, helping them feel confident in understanding and dealing with their disease. These factors are key points for BC patients' adjustment to having the disease, boosting their psychological resilience to deal more effectively with the primary and/or secondary negative effects of medical therapies.

Timing within the disease course can be considered a satisfactory predictor of emotional weakness and/or crisis. Particularly, the participants demonstrated higher levels of anger 6 months after diagnosis (normally at the end of pharmacological treatments), and also at 12 and 18 months following diagnosis. At 36 months after diagnosis, the participants were less able to control their anger level. Anxiety was higher immediately after diagnosis and was well-managed later on. Psychological resilience impacts negative and strong effects of treatments, enhancing patients' personal fight against illness. Moreover, our findings highlight the need for intervention,

according to targeted time points, to facilitate emotional regulation and offer support to survivors in addressing their fears. Enhancing healthy behavior to deal with the effects of surgical and pharmacological treatments should be the objective of psychological interventions. A meta-analysis²⁸ investigating adherence in psychological interventions by patients with BC demonstrated the low adherence rate for psychological intervention acceptance that, combined with high dropout rates, indicates a low desire for help. In addition, some studies have reported unmet psychological needs²⁹⁻³¹; both studies indicated the low rate of adherence to traditional psychotherapy interventions offered in psychological services. Our findings can facilitate the removal of barriers to the acceptance of psychological support by suggesting a plan for psychological treatment modeled on psychological features and the timing within the course of the disease. Tailored psychological treatments in order to meet the emotional needs of young women in oncological path are strongly demanded by patients and medical settings. Women with BC comprise a vulnerable population with emotional needs that are impacted by age, the timing within the course of the disease, and clinical treatments. A combination of effective surgery and pharmacological treatments with emotional elaboration in tailored non-pharmacological treatments might increase and enhance healthy outcomes, not only in terms of the clinical path but also in terms of reintegration to social/working contexts, with restored patients who are not weak but needing support. Overall, our results provide empirical support for clinical practice that can shed better light and thus respond efficiently to the needs of patients immediately following BC diagnosis; the study pays attention on theoretical basis for individualized psychological measures, promoting disease recovering and improving higher quality of life of patients.

This study has some limitations. First, this study is a cross-sectional study, which is difficult to determine the causal relationships, further follow-up studies are needed. The BDI-II and PDI are self-report measures of depression and distress symptoms, respectively, and are not measures of their clinical indicators. Further, the relatively small sample size, as well as the distribution into six subgroups according to the time after diagnosis, limits the generalizability of our findings regarding regaining a normal life.

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REFERENCES

1. Bennet B, Lloyd A, Webber K, et al. Predictors of resilience in women treated for breast cancer: a prospective study. *Journal of Clinical Oncology* 2012; 30 (15 suppl): 9044.
2. Conley C, Bishop B, Andersen B. Emotions and emotion regulation in breast cancer survivorship. *Healthcare* 2016; 4: pii: E56.
3. Costanzo ES, Lutgendorf SK, Mattes ML, et al. Adjusting to life after treatment: distress and quality of life following treatment for breast cancer. *Br J Cancer* 2007; 97: 1625-31.
4. Gibbons A, Groarke AM, Sweeney K. Predicting general and cancer-related distress in women with newly diagnosed breast cancer. *BioMed Central Cancer* 2016; 16: 935-43.
5. Ng CG, Mohamed S, See MH, et al. Anxiety, depression, perceived social support and quality of life in Malaysian breast cancer patients: a 1-year perspective study. *Health Qual Life Outcomes* 2015; 13: 205.
6. Lester J, Crosthwaite K, Stout R, et al. Women with breast cancer: self-reported distress in early survivorship. *Oncol Nurs Forum* 2015; 42: e17-e23.
7. Linley PA. Counseling psychology's positive psychological agenda: a model for integration and inspiration. *Couns Psychol* 2006; 34: 313-22.
8. Quattropiani MC, Lenzo V, Filastro A. Predictive factor of anxiety and depression symptoms in patients with breast cancer undergoing chemotherapy. An explorative study based on metacognitions. *J Psychopathol* 2017; 2: 67-73.
9. Parikh D, De Ieso P, Garvey G, et al. Post-traumatic stress disorders and post-traumatic growth in breast cancer patients: a systematic review. *Asian Pac J Cancer Prev* 2015; 16: 641-6.
10. Di Giacomo D, Cannita K, Ranieri J, Cocciolone V, Passafiume D, Ficorella C. Breast Cancer survivors and psychological resilience among young women. *J Psychopathol* 2016; 22: 191-5.
11. Di Giacomo D. Psychological resilience in early breast cancer young patients: experience in real life. *Journal of Psychosomatic Research* 2018; 109: 99.
12. Burgess C, Cornelius V, Love S, Graham J, Richards M, Ramirez A. Depression and anxiety in women with early breast cancer: five year observational cohort study. *BMJ* 2005; 330: 702.
13. Avis NE, Levine B, Naughton MJ, Case LD, Naftalis E, Van Zee KJ. Age-related longitudinal changes in depressive symptoms following breast cancer diagnosis and treatment. *Breast Cancer Res Treat* 2013; 139: 199-206.
14. Howard-Anderson J, Ganz PA, Bower JE, Stanton AL. Quality of life, fertility concerns, and behavioral health outcomes in younger breast cancer survivors: a systematic review. *J Natl Cancer Inst* 2012; 104: 386-405.
15. Ruddy KJ, Greaney ML, Sprunck-Harrild K, Meyer ME, Emons KM, Partridge AH. Young women with breast cancer: a focus group study of unmet needs. *J Adolesc Young Adult Oncol* 2013; 2: 153-60.
16. Hubbeling HG, Rosenberg SM, González Robledo MC, et al. Psychosocial needs of young breast cancer survivors in Mexico City, Mexico. *PLoS ONE* 2018; 13: e0197931.
17. Mollica M, Nemeth L. Transition from patient to survivor in African American breast cancer survivors. *Cancer Nurs* 2015; 38: 16-22.
18. Molina Y, Martinez-Gutierrez J, Reding K, Yi-Frazier J, Rosenberg M. Resilience among patients across the cancer continuum: diverse perspectives. *Clin J Oncol Nurs* 2014; 10: 93-101.
19. American International Cancer Control, AJCC Cancer Staging Manual. 7th ed. New York, NY: Springer Verlag, 2010.
20. Spielberger CD. State-Trait Anger Expression Inventory-2 (STAXI-2). Professional Manual. Tampa, FL: Psychological Assessment Resources. Beck, 1996. Italian version: Comunian AL. STAXI-2. Giunti Editore, 2004.
21. Spielberger CD, Sydeman SJ. State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory. In: Maurish ME (ed.). The use of psychological tests for treatment planning and outcome assessment. Hillsdale, NJ: Erlbaum, 1994. Italian version: Pedrabissi L, Santinello M. STAI. Firenze: Giunti Editore, 1989.
22. Morasso G, Costantini M, Baracco G, Borreani C, Capelli M. Assessing psychological distress in cancer patients: validation of a self-administered questionnaire. *Oncology* 1996; 53: 295-302.
23. Beck AT, Steer R, Brown G. BDI-II, Beck Depression Inventory: manual. Boston: Psychological Corp., 1996. Italian version: Ghisi M, Flebus GB, Montano A, Sanavio E, Sica C. BDI-II. Firenze: Giunti Editore, 2006.
24. Dooley LN, Slavich GM, Moreno PI, Bower JE. Strength through adversity: moderate lifetime stress exposure is associated with psychological resilience in breast cancer survivors. *Stress & Health* 2017; 33: 549-57.

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25. Seiler A, Jenewein J. Resilience in cancer patients. *Front Psychiatry* 2019; 10: 208.
26. Tedeschi RG, Calhoun LG. Posttraumatic growth: conceptual foundations and empirical evidence. *Psychol Inq* 2004; 15: 1-18.
27. Mens M, Helgeson V, Lembersky B, Baum A, Scheier M. Randomized psychosocial interventions for breast cancer: impact of life purpose. *Psycho-Oncology* 2016; 25: 618-25.
28. Brebach R, Sharpe L, Costa D, Rhodes P, Butow P. Psychological intervention targeting distress for cancer patients: a meta-analytic study investigating uptake and adherence. *Psychooncology* 2016; 25: 882-90.
29. Baker-Glenn EA, Park B, Granger L, et al. Desire for psychological support in cancer patients with depression or distress: validation of a sample help question. *Psychooncology* 2011; 20: 525-31.
30. Tuinman MA, Gazendam-Donofrio SM, Hoekstra-Weebers JE. Screening and referral for psychosocial distress in oncologic practice: use of the distress thermometer. *Cancer* 2008; 1134: 870-8.
31. Min JA, Yonn S, Lee CU, et al. Psychological resilience contributes to low emotional distress in cancer patients. *Support Care Cancer* 2013; 21: 2469-76.