Original Research Article

Cancer Control
Volume 29: 1–12
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DOI: 10.1177/10732748221103327
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Structural Analysis of Social Behavior: Using Cluster Analysis to Examine Intrapsychic Personality Traits Associated With Depression in Women With Breast Cancer

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Abstract

Background: This study aimed to investigate personality traits associated with depression in breast cancer women (BCW).

Methods: Sample: 236 BCW recently diagnosed (early stages). Tests: SASB-Structural-Analysis of Social-Behavior; IPAT-CDQ-Depression. Statistical analysis: cluster K-Means analysis to explore SASB personality-traits considering the 8 SASB clusters (Cl); CDQ scores dichotomized by 50th percentile cutoff (high/low); Pearson's chi square test to compare CDQ levels and SASB traits.

Results: Cluster analysis results supported two distinguishable SASB personality traits (for all SASB Cl-Scales *P* < .001) classified as "Love and Autonomy" (62.2%) and "Control and Hate" (37.8%). Patients with Love/Autonomy traits are spontaneous, accept their deepest feelings and desire to be close to other people (Cl1, Cl2, Cl3, Cl4). They show a medium value of self-control and a low tendency to self-abusive and self-critical behaviors (Cl5, Cl6). They pay attention to themselves and to their needs at emotional and physical levels also if may be occasionally engaged in self-destructive behaviors (Cl7, Cl8). Women with Control/Hate traits are not spontaneous and do not always express emotions (C1, Cl2, Cl3, Cl4) and flexibility in their relationship with others (Cl5, Cl6). In stressful situations, they may ignore the option of choices for self-growth and neglect their needs and those of others (Cl7, Cl8). BCWs with Control/Hate traits scored higher in depression (*P* <.001) than those with the Love/Autonomy profile.

Conclusions: Healthcare professionals should be aware of these personality traits and their association with depression to identify the psychologically most vulnerable BCW and improve the care they provide them. The psychotherapeutic intervention should be planned to face on the personality problems.

Keywords

personality traits, intrapsychic behaviors, interpersonal behaviors, depression, breast cancer

Received November 24, 2021. Received revised May 1, 2022. Accepted for publication May 9, 2022.

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Introduction

Breast cancer is one of the most common cancers in the world and the leading cause of cancer death among women in Italy.[1] Several studies have shown that breast cancer women (BCW) are twice as depressed as the general population with a prevalence of 32%.[2,3] High rates of depression cause deep suffering and impose huge costs on patients, families and health systems. Furthermore, the depressive state is associated with a reduction in overall quality of life, with a negative impact on compliance levels with medical treatment and an increased risk of mortality.[4]

That said, a thorough understanding of the causes of depression is a necessary step to improve symptoms and adherence to therapeutic treatments.[5]

Personality plays an important role considering that depressive symptoms, with their associated personality traits, have deleterious effects on the patient's psychosocial adaptation, with a considerable impact on development and progression of breast cancer.[6,7] This does not mean that it is necessarily a cause of the disease, but it can have a direct impact on the endocrine, immune and nervous systems and/or indirectly affect behaviors such as diet, exercise, sleep, smoking, and alcohol consumption.[6]

In this regard, in a study conducted by our group,[8] using the Structural Analysis of Social Behavior-SASB model by L.S. Benjamin,[9] significant associations emerged between depression and some intrapsychic traits (e.g., low autonomy in making choices with poor acceptance of one's feelings) in a postmenopausal BCW sample.

The SASB observation method allows us to grasp the person in his becoming and gives indications of the evolution of psychic structures as a consequence of interpersonal experiences and allows to describe the personality from normal to pathological. It is validated on the basis of the DSMIV and V and on the Italian population.

It is therefore a tool for analyzing intrapsychic and interpersonal behavior, useful both for the observation of interpersonal action and for the definition of how intrapsychic processes are experienced. It can also be used as a diagnostic and programming tool for interventions aimed at promoting growth and maturation and, in the case of mental illness, recovery and revitalization of intrapsychic structures.[10]

SASB applications extend from research to practice: assessment (diagnosis), treatment of psychopathology and verification of psychotherapeutic intervention.

One of the merits of this system is to focus attention on a psychology that takes into account the totality of the person and is not limited to the description of the pathological, neglecting normal functions and interpersonal processes, which are considered fundamental from the point of view of theoretical explanation and planning and verification of the processes of change.

In the SASB Model three surfaces with four quadrants derive from the intersection of the two orthogonal dimensions (Affectivity and Interdependence) for each of the three types of focus (Proposer, Responder, Self). The meaning of the behaviors is given by the combination of the two dimensions on these surfaces as various states of the ego. "Self" corresponds to intrapsychic behaviors.[10]

Each type of focus is described by the following dimensions: the first dimension is Affiliation-hostility (horizontal dimension), which ranges from hate to love; the second is Autonomy-interdependence-independence (enmeshment-differentiation) (vertical dimension) which ranges from control to freedom; the third dimension is the focus of the behaviors: other, self, introject- (other versus self-interpersonal behaviors).

The affiliation and autonomy dimensions are conceptually continuous, and combine to form a circumplex.[10]

The dimensional end-points and their combinations form the 8 "clusters" of behaviors (Cl).[10]

So, the SASB model circumplex is used to describe personality and define both interpersonal and intrapsychic behaviors, which is the goal of the current study. Cluster analysis is aimed at grouping subjects through similarities and defines personality as "an interrelated system of several traits," exploring the organized structure of variables within the individual.[11]

Based on this theoretical framework, the aim of this study was to explore whether different SASB personality traits (Profiles) (at intrapsychic and interpersonal levels) are present in BCW and their association with depression.

Furthermore, among the necessities in diagnosing depression is that of eliminating or substantially reducing the problems of artificial distinctions between categories and contrived comorbidities and emphasizing the distinction between episodic and chronic depressions, which is currently obscured by the balkanization of chronic depression in numerous categories and specifiers.

The SASB 8 Clusters, describe profiles of personality with different levels and types of mood disorders: the score, the description, and the connection between the SASB-8 clusters of intrapsychic behaviors allow to describe the different type and intensity of mood disorders. For the versatility of the SASB to examine interpersonal and intrapsychic behaviors of individual with depression and for its ability at detecting depressing behaviors,[9] we have chosen to implement it in this study as a screening tool to assess personality traits associated with depression in BCW. We hypothesized the existence of distinct SASB personality traits differently associated with depressive symptoms in breast cancer population. This knowledge can suggest which psychotherapeutic intervention might be more suitable to address specific personality problems and to better cope with the disease path.

Materials and Methods

Patients, Settings, and Procedures

We aimed to study the relation between personality and depression in BCW. To achieve a power of .80 and a medium effect size, a sample of 100 was required to detect a significant model.[7] This is a cross-sectional study.

The study sample was composed of n = 236 women recently diagnosed with breast cancer (early stages) consecutively recruited to participate in study protocol between May

2018 and 2019. All women had undergone a biopsy procedure for the histological diagnosis of cancer before the interview.

Inclusion criteria included: aged 40–70 years (adult age); being able to understand the Italian language, first-time diagnosis of breast cancer confirmed by biopsy; and giving written informed consent to participate in the study. The study was approved by the ethics committees of the INRCA-IRCCS National Institute of Science and Health for Aging and Marche Polytechnic University in Ancona, Italy (IRB approval number: CdB: SC/10/271/bis).

Patients were excluded if: they refused to participate; were unable to provide informed consent; had other forms of cancer; had psychiatric history; had a previous history of malignancy, with exception of non-melanomatous skin cancers. Age and demographic data including marital status and educational levels were collected. Two hundred and seventy patients were approached in the clinic by the physician and asked to participate in the study. All participants signed a consensus form regarding study protocol after detailed explanation by the physician at the Oncology Clinic. Only two hundred and fifty decided to participate and to fill out and sign the consent form. Fourteen patients didn't answer all the questions in the questionnaires. It was therefore decided not to consider them for the analysis. The patients were interviewed by two psychotherapists, working in the hospital and with a year training in administration and interpretation of SASB Model, after the diagnosis by biopsy. The patients filled out all the questionnaires (which included socio-demographic and clinical variables) during the interview.

Measures

All subjects were asked to complete the following psychological and psychosocial questionnaires:

1. Social schedule including information on age, marital status (single, married, widowed, divorced) and educational level (illiterate, primary school, middle school, high school, university).
2. The SASB Intrex Questionnaire that describes the personality structure at intrapsychic and interpersonal levels (Appendix A).[12] This test was chosen for its shortness and because it has the appropriate reliability and validity to evaluate interpersonal/intrapsychic behaviors and is validated on the basis of DSM-IV and DSM-V. Interviewed subjects had to respond to 36 items in the questionnaire describing their intrapsychic and interpersonal behaviors during the last year (e.g., "I let myself feel glad about and pleased with myself just as I am"; "I ignore and don't bother to know my real self"; "I think up ways to hurt and destroy myself. I am my own worst enemy"). They are rated on a 10-point scale ranging from 0 (Never) to 9 (All the time). The 36 questions of Form-A are grouped by a specific score correction in 8 Cl of intrapsychic "Oneself" and interpersonal "Other" behaviors which provide an exhaustive picture of intrapsychic experience from which the interpersonal experience can inferred. Each cluster is represented on a scale ranging from a minimum of 0 to a maximum of 10.

The 8 clusters focused on intrapsychic "Oneself" and interpersonal "Other" behaviors are both complementary and opposite.

The 8 clusters of "Oneself" are the following (see Appendix A for details): SASB Cl 1 = autonomy-assertive and separating; SASB Cl 2 = autonomy and love-self-accepting and exploring; SASB Cl 3 = love-self-supporting and appreciative; SASB Cl 4 = love and control-self-care and development; SASB Cl 5 = control-self-regulating and controlling; SASB Cl 6 = control and hate-self-critical and oppressive; SASB Cl 7 = hate-self-refusing and annulling; and SASB Cl 8 = hate and autonomy-self-negligent and mentally absent.

An Italian version of the SASB Intrex Questionnaire was used for this study.[13]

3. The Institute for Personality and Ability Testing (IPAT)—Clinical Depression Questionnaire (CDQ).[14] This test encompasses 40 questions or statements to which respondents must give one of three possible answers or comments. Items regard concrete situations which give rise to feelings or attitudes common to everybody in certain moments of life. The CDQ is a self-reported measure designed to elicit how people think or feel at one time or another. It gives an accurate appraisal of depression level and type. The range is subdivided among: 0–3 which indicates absence or low depression; 4–7 which indicates medium and medium high level of depression; 8–10 which indicates high level of depression. The Italian validated translation of the original version was used.[15]

Statistical Analysis

Cluster K-Means analysis was used to analyze personality SASB traits on the base of the "Affiliation & Autonomy" dimensions.[10] Affiliation & Autonomy dimensional scores were calculated for intrapsychic and interpersonal behaviors of participants. The k-means algorithm is an iterative algorithm, that is, it repeatedly executes some of its phases and basically it can be said that it is made up of the following steps:

(1) Initialization: The input parameters are defined to run the algorithm;
(2) Assignment of the cluster: each data points is assigned to the closest cluster (or centroid);
(3) Update of the position of the centroid: it recalculates the exact point of the centroid and consequently modifies its position.

The k-means algorithm has the advantage of being quite fast, as few calculations are required and consequently little

Table 1. Cluster K-Means analysis. SASB Personality Traits.

Variable	Final Cluster Centers		F	P
	Love and Autonomy n = 147 62.2%	Control and Hate n = 89 37.8%		
SASB Cl 1	5	4	52,540	P<.001
SASB Cl 2	7	5	106,683	P<.001
SASB Cl 3	6	4	179,878	P<.001
SASB Cl 4	6	4	131,219	P<.001
SASB Cl 5	6	5	44,507	P<.001
SASB Cl 6	2	3	17,257	P<.001
SASB Cl 7	2	3	36,867	P<.001
SASB Cl 8	3	3	13,874	P<.001

processing time to calculate the distances between the data points and the centroids at each iteration (obviously this depends on the data set and the number of clusters).

Socio-demographic characteristics of SASB personality profiles were expressed by means ± standard deviation for continuous variables and by number of cases and percentage for categorical ones. CDQ scores were dichotomized by the 50th percentile cutoff (low and high). We used this dichotomization because it was better for discriminating our sample, in accordance with the aim of the study. Pearson's correlation coefficient was used to compare high CDQ levels and SASB personality profiles. Significance was accepted as $P < .05$. Statistical analysis was carried out using SPSS® version 20.0 for Windows (IBM Corporation, Armonk, NY, USA).

Results

Cluster Analysis

A total of 236 BCW participated in the study. The mean age was 55.1 (± 10.7) years. Considering the marital status, most of them were married (80.1%), whereas the remaining percentage was composed of single (9.3%), widowed (8.9%) or divorced/separated (1.7%). The educational level of the total sample included women with primary education (41.1%), high school (27.1%), middle school (22.9%), university (8.1%), or illiterate (.8%).

Using Cluster K- Mean analysis, two distinct personality profiles of BC patients were identified based on their SASB–Intrex-derived 8 SASB Cl scores. As summarized in Table 1, the largest proportion of patients (62.2%; n = 147) was classified in the "Love and Autonomy" traits. A second group, that comprised 37.8% of the sample (n = 89), was classified in "Control and Hate" traits.

Differences Between Intrapsychic and Interpersonal SASB personality Traits

Mean scores for each SASB Cl obtained for "Love and Autonomy" and "Control and Hate," are reported in Table 1. Compared to the BCW with "Control/Hate" traits, those with "Love/Autonomy" traits reported significantly higher scores in SASB Cl 1 (F = 52,540, $P < .001$), SASB Cl 2 (F = 106,683, $P < .001$); SASB Cl 3 (F = 179,878, $P < .001$), SASB Cl 4 (F = 131,219, $P < .001$), and SASB Cl 5 (F = 44,507, $P < .001$) but significantly lower scores in SASB Cl 6 (F = 17,257, $P < .001$), SASB Cl 7 (F = 36,867, $P < .001$), and in SASB Cl 8 (F = 13,874, $P < .001$) (Table1).

Differences in Demographic Characteristics Between SASB personality Traits

The differences in patient socio-demographic characteristics between the 2 SASB Personality traits are shown in Table 2. There were no differences for some patients' characteristics such as age, marital status and educational level between the two SASB personality traits.

SASB Love/Autonomy Traits

The SASB Love/Autonomy personality profile includes the following traits: a low to medium aptitude to be spontaneous and autonomous (Cl1). Generally, women with these personality traits show a good acceptance (average value) of their deepest feelings (Cl2), but often do not express them spontaneously, also due to the control exercised over themselves (Cl 5). The traits of self-acceptance and self-appreciation are linked to an adequate capacity for self-esteem and self-care (Cl3, Cl4). These women exhibit an adequate level of Cl 4, which means they use energy to achieve what is needed and desired by exercising the ability to be positively self-constructing. In fact, they are able to actively develop their skills and other important qualities for personal growth: in general, these behaviors are present even if conditioned by the medium-low autonomy and the control exercised over themselves (Cl5), sometimes in a significant way. These intrapsychic behaviors, including self-esteem, could be questioned in the presence of stressful situations (Cl2, Cl8), with

Table 2. Differences in sociodemographic characteristics between the SASB personality traits.

	Love and Autonomy *n* = 147	Control and Hate *n* = 89	*P*
Age (years)	55.0 ± 11.4	55.1 ± 9.6	.920
Marital status			
Single	11 (7.5%)	11 (12.4%)	.487
Married	118 (80.3%)	71 (79.8%)	
Widowed	15 (10.2%)	6 (6.7%)	
Divorced/separated	3 (2.0%)	1 (1.1%)	
Educational level			
Illiterate	1 (.7%)	1 (1.1%)	.285
Primary	65 (43.5%)	33 (37.1%)	
Middle school	35 (23.8%)	19 (21.3%)	
High school	32 (22.5%)	31 (34.8%)	
University	14 (9.5%)	5 (5.7%)	

the consequence of ignoring the possibility of choices for personal growth (Cl8). In fact, they may occasionally adopt behavior where they neglect their choices and/or the direct expression of their own experiences and emotional needs, due to their medium-low autonomy and medium-high control.

On an interpersonal level, women with these traits may be dependent and conditioned in their relationship with others. Moreover they do not always help others by expressing trust and encouraging an independent identity (Cl1) due to their tendency to control (Cl5) and to low autonomy. BCWs may be able to be empathetic, grateful and understanding towards others (Cl2) but do not always express these feelings due to the medium-low spontaneity and autonomy (Cl1) and the control exercised over themselves and, on an interpersonal level, towards others.

Even if they wish to be attentive and close to the each other, they may incur in behavior of neglecting the option of choices for the growth of others (Cl3, Cl8): these behaviors can manifest themselves especially in the presence of stressful situations.

On an interpersonal level they occasionally express critical behaviors, blaming the other (Cl6). Considering the low scores reported in Cl7 they are rarely involved in self-destructive behaviors in the physical and emotional dimensions and rarely threaten or hurt the other (Table2).

SASB-Control and Hate Traits

Women with "Control/Hate" traits show low values of autonomy, spontaneity, self-acceptance and, on an interpersonal level, are dependent on others and do not promote the independence of others (Cl1). Furthermore, they show low appreciation towards themselves, reporting medium low capacity for self-esteem and self-care. (Cl3). This type of women also shows an average low attitude of acceptance of their deepest feelings (Cl2) and a low attitude of caring for themselves and others (Cl3). The direct expression of the deepest feelings is low and even if they can aspire to a real intimacy with others it is difficult for them to achieve it, both due to a lack of spontaneity, openness towards themselves and others (Cl4) and control (Cl5).

Infrequently they actively promote self-growth (and the growth of relationships with others) showing a poor energy to obtain what is needed and desired also in interpersonal relationships (Cl4).

They exercise medium self-control (Cl5) to achieve their objectives. A low aptitude to directly express their feelings and moods is one of the effects of this control (Cl5). On an interpersonal level, they control the other: they control what must be done and said for "the good of the person." They in general do not express spontaneity and flexibility in the relationship with others (Cl4, Cl5, Cl6). In the presence of stressful situations, they may ignore the option of choices for self-growth and, at interpersonal levels may occasionally neglect the needs of others not supporting them in their free choices. (Cl1, Cl8). They may have difficulties in taking care of themselves and others and of their physical and emotional needs (Cl7). In fact, in the presence of stress, these patients may not always be able to support themselves in pursuing their goals as they have difficulty in taking care of their psycho-physical health. All these dimensions are linked to depression in the SASB circumplexity (Table 2).

Intrapsychic SASB personality Traits and depression

Psychometrics CDQ measures (high and low) in the different SASB personality traits are shown in Table 3. Depression levels versus SASB Love and Autonomy traits showed: 22.4% of low-CDQ and 77.6% of high-CDQ; Control and Hate SASB traits showed: 3.4% of low-CDQ and 96.6% of high-CDQ (Table 3). Compared with the Love/Autonomy traits (Table 4), the Control and Hate traits shows a significant association with depression ($P < .001$).

Discussion

The key findings of the present study were the two SASB Profiles indicating structured personality traits that account for readily

Table 3. Associations between SASB personality traits and Depression-CDQ (low and high levels).

			SASB Traits		
			Love and Autonomy	Control and Hate	Total
CDQ	Low	Number	33	3	36
		%	22,4%	3,4%	15,3%
	High	Number	114	86	200
		%	77,6%	96,6%	84,7%
All		Number	147	89	236
		%	100,0%	100,0%	100,0%

Table 4. Chi-Square Tests. Correlation between intrapsychic/interpersonal SASB traits and depression (high and low) in BCW.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	15,609[a]	1	,000		
Continuity Correction[b]	14,168	1	,000		
Likelihood Ratio	18,786	1	,000		
Fisher's Exact Test				,000	,000
Linear-by-Linear Association	15,542	1	,000		
N of Valid Cases	236				

[a]0 cells (0,0%) have expected count less than 5. The minimum expected count is 13,58.
[b]Computed only for a 2 × 2 table.

discernible patterns in their intrapsychic/interpersonal behaviors experienced during the last year. The description of SASB profiles emerged from the description of intrapsychic behaviors in the last year by the BCW: it indicates that the emerging profiles do not concern temporary behaviors associated with serious diagnosis but long term personality traits.

The present pattern of results adds to the current literature in an important way because cluster K-Means analysis made it possible to identify two different personality traits (Love/ Autonomy *vs* Control/Hate) distinguishable in adaptive or maladaptive traits, showing a different impact on the ability to deal with the condition that the tumor creates in a person's life. Control/Hate personality traits may be indicative of a personality with intrapsychic and interpersonal problematic behaviors, and a tendency to be depressed.

Moreover, to the best of our knowledge, this is the first study on women with breast cancer, which uses the SASB model to examine personality traits in relation to depression.

At this point, we can make some considerations.

Problematic behaviors such as the depressive state linked to intrapsychic behaviors of neglect of one's own needs on an emotional and physical level and low self-affirmation and autonomy, shown by women with Control/Hate traits, can hinder disease prevention and self-care behaviors. The depressive state contributes and is part of this intrapsychic behavior of neglect of one's own needs on an emotional and physical level. As a second consideration, in agreement with a study by Vespa et al,[17] we believe that BCW with Control and Hate behaviors can have more difficulty to cope with diagnosis and disease, manifesting behaviors of self-neglect both in the physical and emotional dimensions.

These women, in fact, may show personality traits characterized by difficulties in taking responsibility for their actions and consequences, not being aware of their role in determining the circumstances and acting directly on the various elements. Due to their low autonomy and self-affirmation (Cl1) they have difficulty making free choices based on their needs both emotionally and practically.

For these considerations, in line with Lemogne et al[16] who observed an association between personality and prevention-oriented behaviors in BCW (i.e. screening adherence, mammography use etc.), we believe that Control–Hate type of personality, which emerge in the present study, may encourage non-adherence to prevention behaviors, and consequently increase the risk of cancer.

Moreover Cerezo[18] affirmed that personality traits could affect the psychological adjustment of breast cancer survivors.

Conversely, women with love and autonomy traits exhibit attention-to-care behaviors that may resemble the personality dimension of conscientiousness of the study conducted by Connor-Smith and Flachsbart,[19] which can predict problem-solving and emotional-cognitive restructuring skills.

Women with Love-Autonomy have some personality traits such as good levels of self-confidence, self-esteem, and of acceptance of their own emotions, that are generally connected with ability to effectively deal with a cancer diagnosis and associated treatments. In fact, they are less likely to neglect themselves and are more prone to develop their potentialities and capacities. Therefore, these women are more able to achieve emotional and psychic equilibrium, also through the difficulties of life (stressful events) and reconsolidate themselves after crises, because of their ability of being in touch and aware of their emotions and feelings. We agree with Xunlin[27] who affirms that self-awareness is a function of coping skills with stressful situations such as the threat posed by the onset of a tumor. Moreover, our findings showed that women with Control and Hate personality are more susceptible to experience depression compared to women with Love and Autonomy traits. We can assume that the results of the current study are similar in this aspect to a case-control analysis by Vespa et al[17] previously conducted by our study group, that showed significant associations between some SASB traits and depression in a group of postmenopausal BCW. In particular, we observed that patients, who are self-critical and oppressive towards themselves and with low acceptance of their own emotions, are also more depressed.

Furthermore, in the present study a high percentage of depression is present in both SASB personality traits. These results are in agreement with Purkayastha et al[20] and Civolotti et al[21] who suggest that the period after diagnosis is particularly difficult for all these patients (all subjects enrolled were recently diagnosed with early stages of breast cancer). However, Love/Autonomy women were more able to deal with and overcome this depression than patients with a Control and Hate profile, as the described intrapsychic and interpersonal traits indicate greater ability for adaptive behavior.

In addition, while in the Love/Autonomy personality traits it can be assumed that depression can be a reaction to stressful events (onset of the disease, restructuring of life to follow medical therapy), in the Control/Hate personality traits it can be assumed that these subjects were predisposed to depression (or already depressed) even before the onset of the disease, as the description of their corresponding intrapsychic behaviors during the year before the diagnosis can point out.

Oh et al.[22] reported that depression can also be associated with the difficulty these women have in expressing their emotions and needs and in being in deep contact with others (interpersonal behaviors) and therefore not obtaining the help and emotional support they need, unlike patients with Love/Autonomy traits. Emotional expression is usually helpful because it gives the person an outlet for his/her own feelings, and an opportunity to get better emotional support.[22-24]

The interpersonal Control/Hate traits, that emerged from the present study may confirm this consideration and may suggest a need of closer relationships. Therefore, it is possible to affirm these BCW may not obtain the desired emotional interpersonal support.

Our study had several limitations. First, all the subjects are adult BCW, and the results may not be extrapolated to other diseases or to patients in different age groups (younger or older). Second, a sampling bias is present in the data because all the subjects attended two institutions in the same city and thus are not representative of the BCW population.

Third, our results provide a snapshot of depression associated with intrapsychic behaviors after cancer diagnosis but not during the treatment phase. The depression symptoms may differ during the treatment phase or at other points in the cancer journey. Future longitudinal studies could make these comparisons and test the evolution of depression symptoms and the correlation with personality traits.

Despite the limitations, our findings suggest that more awareness of these personality characteristics and their association with depression in BCW is needed for the following reason: Knowledge of intrapsychic and interpersonal traits, through a personality screening, within standard time periods, may be a marker of patients with a bad adaptation to cancer treatment. Our findings are of clinical and practical importance because knowledge of the differences in intrapsychic and interpersonal personality traits, that may contribute to the onset of depression in breast cancer patients, could provide information on women most at risk for depression, as well as provide guidance for more targeted interventions. In fact once the significant problematic intrapsychic behaviors have been detected, specific psychotherapeutic interventions may be required in patients with Control and Hate traits, such as Interpersonal Reconstructive Therapy,[25,26] in order to facilitate contact, processing and integration of emotional experiences and intrapsychic conflict and to welcome one's feelings so that the patient becomes able to draw on the resources necessary for a successful satisfaction of the deepest needs and a good adaptation to the condition of illness.

An integrated holistic psychotherapy (for example, with mindfulness—based interventions)[27] could instead be more desirable for women with traits of Love and Autonomy in order to acquire a better awareness and use of the available resources (internal and external).

Conclusion

In conclusion, although the questionnaire chosen to measure personality is not in standard use, we believe that the use of the SASB model for the personality assessment in this oncology population can help clinicians make useful predictions about the patient's personality (at intrapsychic and interpersonal levels) and would allow a more timely start of integrative, personality-based treatments. Understanding potential mechanisms through which personality influences depression levels in breast cancer population can help the development of more targeted interventions to treat depression.

Acknowledgments

Thanks to Monica Glebocki for correcting the English.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethical Approval

Ethical approval for the study was given by the ethics committees of the INRCA-IRCCS National Institute of Science and Health for Aging and Marche Polytechnic University in Ancona, Italy (IRB approval number: CdB: SC/10/271/bis).

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Appendix A

Description of the 8 clusters of "Oneself"—Intrapsychic experience:

SASB-Cl 1 = Autonomy—Assertive and separating. This type is based on what he/she considers necessary at the time. The attitude may be spontaneous with self-acceptance and pleasure in his/her experience or it could be disoriented with little weight given to problems and important choices in life.

SASB-Cl 2 = Autonomy and love—Self-accepting and exploring. This type of person accepts and reacts to his/her deepest feelings, feeling solid, integrated and "together". The desire to be open to feelings generally indicates a state of self-satisfaction and acceptance of weak and strong points.

SASB-Cl 3 = Love—Self-supporting and appreciative. This type is deeply appreciative of him/herself and recognizes the ability to treat, care, console and reconsolidate him/herself. It underlines the capacity for self-esteem and in extreme cases, of self-adoration.

SASB-Cl 4 = Love and control—Self-care and development. This type protects and realistically examines the capacity of being positively self-constructive, actively developing his/her abilities and other important qualities for self-growth. This cluster highlights the use of energy to obtain what is needed and desired.

SASB-Cl 5 = Control—Self-regulating and controlling. This type practises self-control. Great self-control is practised for chosen objectives. This may include paying attention to behaviour in order to ensure conforming to ideals, including great activity programmed in order to reach objectives.

SASB-Cl 6 = Control and hate—Self-critical and oppressive. This type of cluster identifies someone who oppresses him/herself and accuses him/herself of inadequacy, evoking feelings of self-guilt and shame. Feelings of uncertainty and guilt can be used by false induction preventing recognition of what is useful and good for the person. This could be self-punitive behavior, sometimes destructive enough to require therapeutic intervention.

SASB-Cl 7 = Hate—Self-refusing and annulling. This is a self-destructive type who ignores illnesses and wounds, and self-exhaustion. This cluster is implicative of self-refusal and self-deprivation as well as self-inflicted cruelty. Such self-destructive behavior calls for serious qualified psychotherapeutic intervention.

SASB-Cl 8 = Hate and autonomy—Self-negligent and mentally absent. This cluster identifies someone who may daydream, subsequently not developing his/her abilities and potentials to their full extent. In extreme cases, these individuals are unreasonable and have unjustified ideas, regarding behavior without any criterion and falling into self-destructive situations. In these cases, it could be beneficial to examine the danger of self-destructive behavior with a therapist.

Description of the structure of Structural Analysis of Social Behavior (SASB)

The SASB observation method allows us to grasp the person in his becoming and gives indications of the evolution of psychic structures as a consequence of interpersonal experiences. It is therefore a tool for analyzing interpersonal and intrapsychic behavior, useful both for the observation of interpersonal action and for the definition of how intrapsychic processes are experienced. It can also be used as a diagnostic and programming tool for interventions aimed at promoting growth and maturation and, in the case of mental illness, recovery and revitalization of intrapsychic structures.

One of the merits of this system is to focus attention on a psychology that takes into account the totality of the person and is not limited to the description of the pathological, neglecting normal functions and interpersonal processes, which are considered fundamental from the point of view of theoretical explanation and planning and verification of the processes of change.

Structure of the SASB

The structural analysis model of behavior consists of the "Other", "Self" and "Introject" areas or Surfaces, redefined by Scilligo: Interpersonal Parent (Other), Interpersonal Child (Self) and Existential Child (Introject).

In the following description we will adopt Scilligo's terminology.

Interpersonal Parents and Interpersonal Children refer to the dyadic interpersonal relationship.

The Existential Child, on the other hand, refers to the systems of prescriptions, decisions, introjected values and

resulting from the interaction between Parents and interpersonal Children.

The "Other" or Interpersonal Parent surface can describe the person who initiates the action in interpersonal relationships, while the "Self" or Interpersonal Child can describe the person who responds or reacts to the Other.

The "Introject" surface is what the person has internalized as a result of the Other-Self interaction.

The categories of Parents and Children are defined by two dimensions placed on two orthogonal axes: vertical (ordered) axis Interdependence; horizontal axis (abscissa) Affiliation. The axis of affiliation goes from a pole of positive affectivity, called Love, to a pole of negative affectivity, called Hate or Hostility; the axis of interdependence goes from a pole that indicates Freedom or Autonomy, to an opposite pole of high Control or Submission.

The two axes determine four quadrants: the first is comprised by the surface between the Love-Freedom poles; the second, counterclockwise, is determined by the surface that lies between the poles of Freedom or Autonomy and Hatred; the third is the surface between the poles of Hatred and Control.

Furthermore, quadrant i is opposite to 3, 2 to 4. Thus the Child-Free is contained between the Love-Autonomy axes and the Affectionate-Parent between the Love-Freedom axes; for the opposite pole, the Adapted-Negative Child is contained between the Hate-Submission axes and the Parent-Critical-Negative is contained between the Hate-Control axes; the Rebellious Child is located between the Autonomy-Hate axes and the Unprotected Parent is located between the Love-Submission axes; the Parent-Critical-Positive is contained between the Love-Control axes. Furthermore, the quadrants of the Parent and those of the Child with the same position with respect to the orthogonal axes are complementary. The complementary quadrants are: Affectionate Parent-Free Child; Critical-Positive Parent-Positive Adapted Child; Negative Critical Parent Negative Adapted Child; Unprotective Parent—Rebellious or Vengeful Child.

The concept of complementarity indicates that if the Interpersonal Parent proposes behaviors that stimulate "Friendly Autonomy" and the "Self" (Interpersonal Child) responds with the behavior of "Enjoys Friendly Autonomy," precisely the complementary behavior. Each quadrant is also in the original model divided into nine bands (Benjamin, Scilligo).

Each of the bands contains phrases formulated in such a way that they are specifically saturated with affiliate content or interdependence. For example, by numbering the eight axes within the quadrant, the ninth is the reference axis of affiliation or interdependence and, indicating with 1 the band closest to the axis of affiliation and with 8 the most close to the axis of interdependence, the first band will have a description that contains eight parts of affiliation and one of interdependence, the second band seven parts of affiliation and two of interdependence and so on up to the eighth band, which contains a part of affiliation and eight of interdependence.

The first band will have a saturation of eight parts of Love and a part of Freedom, the second band seven parts of Love or two of Freedom, and so on. The nine bands (also including those of the reference axes indicated with O) are defined as follows:

O = basic primitive elements;
1 = approach - move away;
2 = satisfactions c ~ basic needs;
3 = attachment;
4 = communication and rationality;
5 = attention to personal development;
6 = equality in relations;
7 = intimacy and distance;
8 = identity.

The bands thus taken refer to the developmental development of the child (which we discussed in chapter 1), from the moment of birth to the conquest of identity and personal maturity. Furthermore, the bands of all quadrants have similar evolutionary meanings but different content. For the definition of the bands.

Now we will proceed to the description of a further simplification of the current model by Scilligo, which consists in reducing the number of bands of each quadrant from nine to three.

The content of the three bands summarizes the corresponding nine.

In this way, we will have twelve bands for each floor and, precisely, twelve Interpersonal Parents, twelve Interpersonal Children and twelve Existential Children. Each band is numbered.

Now, we will proceed to the operational description of the meaning of the bands and that is of the variables or dimensions they contain.

Relations between the various bands

There are relationships between the various groups of Parents and Children and these relationships are complementary and antithetical.

Complementarity relationships

We have already mentioned the complementarity relationship in relation to quadrants. It is also valid for the bands: in fact, the corresponding bands of the three surfaces of the Parents and the Children are complementary.

An example in this regard can be sufficiently illustrative: Parent n. 2 Empathic is complementary to the Interpersonal Child n. 2 Direct and, since the parent and the Interpersonal Child represent the two components of the Interpersonal relationship, when the parent n. 2 shows the behavior of "he is open to dialogue, accepts and confirms the other person empathically, understands and listens even if or disagrees," Interpersonal Child n. 2 responds with the behavior of "responds directly and explicitly, communicates in an affable and sensitive way, so as to be understood well (Interpersonal Child n. 2 and Direct). Now, since the Existential Child represents

what the person internalizes as a result of the Interpersonal Parent-Interpersonal Child (Other-self) relationship, when the Parent shows behavior n. 2 Empathic and the Interpersonal Child responds with behavior n. 2 Direct, in the long run the Existential Child internalizes behavior n. 2, that is: “He allows himself to be as he is with his strengths and weaknesses, if he accepts and abandons what he feels in his heart he feels good about himself” (Existential Child n. 2).

It can be seen that here is a simplified description of the Parent-Child relationship as an evolutionary sequence, as we have already noted above.

The concept of complementarity is useful in clinical use because it allows you to make predictions about the behaviors that are likely to occur when starting an intervention. The interaction between two complementary bands allows us to predict what the Existential Child will be.

There are also opposite bands on the same quadrant, for example band n. 1 Autonomous is opposite to band n. 7 of the Interpersonal Child, etc.

Antithetical relationship

The antithesis is the opposite of the complement. This concept is very useful in therapeutic or educational intervention. An example in this regard can be exhaustive: the antithesis of n. 7 Authoritarian of the Interpersonal Parent is the Interpersonal Child n. 1 Authoritarian (the opposite of the Child n. 7 Remissive, which the complement of the Parent n. 7 Authoritarian) and the complement of the Interpersonal Child n. 1 is Parent n. 1 Liberal.

Now the therapist or educator in front of a submissive person, who therefore had an Authoritarian Parent, will be Liberal, developing the autonomy of this person. At the same time, he will develop the complement of the Interpersonal Child n. 1, that is, the Existential Child n. 1 Spontaneous, which is the result of the internalization of the relationship with a Parent n. 1 Liberal (which is precisely the complement of him. Some considerations on the evolutionary significance of the Dimensions of the Parent and of the Children.

Considering the categories of Parents and Children, we will proceed to a description of the relationship existing between them and the evolutionary stages of the Child and, therefore, we will locate them in the various quadrants.

As we have described in the first chapters, the relationship between mother and child in the first years is symbiotic, that is, of complete dependence of the child on the mother. The points of the model that physically indicate a symbiotic relationship are those close to the identity bands in the vicinity of the control-submission pole.

Parent n. 6 and also n. 7, can manifest this dimension, as the symbiotic relationship is characterized by the fact that the mother specifies “what is good for the child and provides for everything and the child passively accepts and transforms himself like the mother violates” (Interpersonal Child n. 6 and 7).

The symbiotic relationship is constructive if it is suited to the evolutionary stage of the Child or if it occurs in particular and limited situations of the adult. Band n. 7 of the Interpersonal Parent—“Controls and manages the other and requires that they accept their own rules and ways of life, creates restrictions and limits”—and already a negative symbiosis as it is strongly taxing. As we have previously said the Child in the case in which the mother does not allow him to spontaneously build her Self systematically, in the long run, she makes up for situations of self-denial, with the construction of a false Self.

The bands adjacent to n. 6 and n. 7 (both of the Interpersonal Parent and the Interpersonal Child) both on the negative and positive sides of the pole of control and submission still indicate the persistence of the symbiotic relationship. While category n. 6 of the Parent (Stimulant) denotes less control and more loving kindness, category n. 7 of the (Authoritarian) Parent denotes less control but more hatred. Category n. 7 of the Authoritarian Interpersonal Parent: “He controls and manages the other, requires him to accept his own rules and ways of seeing, creates constraints and myths.” Furthermore, this category corresponds to the Interpersonal Child n. 7—Submissive—“He gives in and submits to others, he strives to observe their rules and favorite requests, he apathetically does what they want".

In correspondence with the aforementioned dimensions or categories we have the Existential Child n. 6 and 7 Inhibited Existential Child n. 6 Programmed: “he tries hard to foresee and find what he needs, he adjusts himself to make sure that he does what he has to do tries to adapt to the ideal that he has proposed.” Existential Child n. 7 Inhibited: “It controls and manages itself, it is adapted to the established rules and norms, it is passive and does not come forward.”

These categories are the most indicative of the intrapsychic outcome of the symbiotic relationship with positive or negative affect.

During natural growth, the symbiotic relationship is exercised; the child will tend to gradually acquire greater autonomy and will pass to size n. 5 of the Interpersonal Child, where there is less submission up to entering dimensions n. 4 (Interpersonal Child) and beyond which denote a gradual increase in freedom (see the Interpersonal Child Chart).

At the same time the mother, if the interaction process is normal, she will tend to move into the corresponding dimensions n. 5 and n. 4, decreasing control, up to entering the dimension 4 of the Interpersonal Parent: “gives the other signs of tender intimacy, invites him to keep in touch with her, supports him and pays attention to him.” As she continues, she gives more and more freedom up to size n. 3, 2, 1 of the Interpersonal Parent, which indicate empathy and acceptance of the child as it is, and expressions of affection. This will allow the child in the long run to build a solid structure with a good sense of personal identity, trust and self-acceptance.

In cases where the symbiotic process does not evolve naturally, the mother will try to resist and oppose the child’s attempts to disengage. If the child continues in his

attempts, the mother will engage in behaviors that denote less control, but increases resentment and rejection, which are described by the dimensions # 11 and # 12 of the Interpersonal Parent.

The child's reactions will be the complementary behaviors represented by dimensions n. 11 and n. 12 of the Interpersonal Child (see the Table of the Interpersonal Child) and the Existential Child will internalize the behaviors described by dimensions n. 11 and 12 (see Existing Child Table).

If the mother, while growing up, does not help her child to disengage but rather hinders him and he continues his effort of rebellious autonomy, the mother will probably react by exercising less control and starting to bestow freedom in an atmosphere of hatred and resentment (Interpersonal Parents n. 10) (see Interpersonal Parents Table), and with a neglected and careless freedom.

The child will tend to react with a rebellious autonomy that does not lead to an integration of identity.

This is a schematic description of the bands in relation to the evolutionary stages of the child through the interaction with the parents.

The relationship between parent and child is very varied and contradictory at times, despite this the categories are exhaustively indicative.