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Stress and Post-traumatic Growth of people with cancer: identification of associated factors

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Abstract: Objectives: Evaluate indicators and identify associated factors of post-traumatic stress disorder (PTSD) and post-traumatic growth (PTG) in individuals undergoing oncological treatment. Method: Quantitative, cross-sectional, analytical survey design with a non-probabilistic sample of 74 participants. Six instruments measuring PTSD, PTG, spiritual well-being, illness perception, and social support were employed. Data were analyzed using descriptive and inferential statistics in the Statistical Package for Social Science (SPSS). Results: It was evidenced that 21.60% of patients presented clinical indices of PTSD, and 85.12% showed a high index for PTG. High satisfaction indices were also observed for social support (86.48%), spiritual well-being (95.94%), and in identifying cancer as a potential threat to life (71.57%). Females, unmarried individuals, those inactive or unemployed, and those receiving public health support exhibited higher PTG indices. Women exhibit higher PTSD indices than men. Negative correlations were found between PTSD and spiritual well-being, and positive correlations with illness perception. Illness perception emerged as the variable with the greatest predictive power for PTSD indices. Conclusions: It is concluded that the threatening perception of the illness is a predictor of PTSD, highlighting it as a risk factor that requires attention in health prevention plans.

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Keywords: Posttraumatic stress disorder, posttraumatic growth, cancer.

ESP Estrés y Crecimiento Postraumático de personas con cáncer: identificación de factores asociados

ESP **Resumen:** Objetivos: Evaluar los indicadores e identificar los factores asociados al trastorno de estrés postraumático (TEPT) y al crecimiento postraumático (CPT) en personas sometidas a tratamiento oncológico. Método: Diseño cuantitativo, transversal, analítico y de encuesta, con una muestra no probabilística compuesta por 74 participantes, utilizando seis instrumentos que miden TEPT, CPT, bienestar espiritual, percepción de la enfermedad y apoyo social, analizados a través de estadísticas descriptivas e inferenciales, en el Programa Estadístico para Ciencias Sociales (SPSS). Resultado: Se evidenció que 21,60% de los pacientes presentaron índices clínicos de TEPT y 85,12% un índice elevado para CPT. También se observaron índices elevados de satisfacción con el apoyo social (86,48%), bienestar espiritual (95,94%) e identificación del cáncer como una posible amenaza a la vida (71,57%). Las personas del género femenino, solteras, inactivas o desempleadas y atendidas por el servicio público de salud presentan mayores índices de CPT. Las mujeres muestran mayores índices de TEPT que los hombres. Se encontraron correlaciones negativas entre TEPT y bienestar espiritual y correlaciones positivas con la percepción de la enfermedad. La percepción de la enfermedad fue la variable con mayor poder predictivo para los índices de TEPT. Conclusiones: Se concluye que la percepción amenazante de la enfermedad es un predictor de TEPT, siendo esta una variable de riesgo que requiere atención en los planes de prevención de daños a la salud.
Palabras clave: Trastorno de estrés postraumático, crecimiento postraumático, cáncer.

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1. Introduction

Neoplastic diseases pose a challenge to public health and healthcare systems worldwide. They represent one of the leading non-communicable chronic diseases and the primary cause of death globally[1]. An individual, upon receiving their diagnosis, may encounter various challenging circumstances that are unique to the oncology context. This includes aspects such as suffering, physical mutilation, disfigurement, and losses experienced by the patient and their family, in addition to the physical symptoms themselves. There are changes in body image and social functions, fear of treatment and its effects, thoughts about the irreversibility of the disease, concerns about costs, and the frequent contemplation of death[2-4].

The intense exposure to these circumstances occurring in different phases of the disease, which require the issuance of adaptive responses to the context, makes cancer a multidimensional stressor[5-6]. Cancer can be understood as a potentially traumatic event, as there is a threat to the person's life and involves significant suffering[7,8]. Among the possible outcomes associated with the experience of traumatic situations, Post-Traumatic Stress Disorder (PTSD) is the most frequently studied[9].

Given the panorama of losses and extreme stress experienced in all phases of the disease, studies identify PTSD reactions in oncology patients as well. A systematic literature review

revealed that PTSD is more common in cancer survivors than in the general population, and the occurrence of this disorder in patients with a history of cancer depend on clinical and demographic factors[9]. The experiences of treatment, added to the possible physical and emotional consequences caused by cancer, can compromise the assimilation of this reality, generating long-term effects and contributing to maintaining the intensity of a stressful stimulus[10].

Identifying and assessing PTSD can be challenging because symptoms manifest heterogeneously in patients who have completed oncological treatment[11] and there are often other associated comorbidities, such as depression and anxiety, which can complicate its differentiation from other psychopathologies.. Faced with these challenges, it is recommended to conduct clinical investigation, especially in individuals presenting significant symptoms of depression and/or anxiety and/or a history of substance abuse[11].

Potentially stressful events, such as cancer, are undesired and challenging circumstances that mobilize individuals' adaptive resources to understand their world[12]. As a consequence, the experience of a traumatic event can also lead the individual to reexamine the core elements of beliefs that define their worldview, potentially leading to an experience of Post-Traumatic Growth (PTG)[13-14]. PTG is defined as positive changes in some aspect of human experience that occur as a result of coping with stressful or traumatic situations[12,14]. It is constituted by five dimensions: (1) increased appreciation of life in general; (2) more meaningful interpersonal relationships; (3) increased sense of personal strength; (4) changes in priorities; and (5) a richer spiritual and existential life[15]. In this sense, it is understood that the greater the need to reexamine beliefs, the higher the probability of experiencing growth after trauma[16-17]. Literature confirms that, despite the various stressors faced by this population, it is possible for individuals to experience personal growth as a result of coping with the disease[18-19].

Certain variables related to oncological illness can influence the response to PTSD and/or PTG, such as the stage of the disease, type of treatment, prognosis, subjective assessment of the illness experience, coping strategies employed, previous traumas, and a history of psychiatric disorders[19]. Similarly, illness perception has been studied as a variable that can interfere with the development of PTSD and PTG. When facing a threatening illness, individuals develop a pattern of beliefs about their condition, and this is essential in understanding their behaviors regarding the illness[10].

In addition to illness perception, another studied factor is social support. It is defined as interpersonal relationships in which there is the existence or availability of individuals to trust, show concern for others, value, communicate, and provide assistance with available resources. In this context, it can involve natural collaborators (family members), informal groups (support groups), and formal and institutionalized support, such as organizations assisting individuals in treatment. The presence of social support, when satisfactory, can contribute to a better recovery and experience of the health condition, promoting improved quality of life, restoration of self-esteem, and autonomy[20].

There is also a growing interest in the effects of spirituality on illness, understood as a way of expression and manifestation of the mystery of life and dimensions of reality, whether material or immaterial, through beliefs, rituals, and practices[21]. In this sense, the use of religious and spiritual beliefs and behaviors can facilitate problem resolution and prevent or alleviate negative emotional consequences of stressful life situations[22]. Individuals who have undergone or are going through oncological treatment mobilize psychosocial and spiritual resources to cope with the suffering and adverse effects of this experience[23]. Given the multitude of coping resources, both spirituality and religion can be associated with manifestations that are either beneficial or unfavorable[22].

In healthcare approaches, considering religion/spirituality is important for patients diagnosed with cancer. Advancing in this matter is crucial to more precisely define the role of the healthcare team in assessing and promoting spiritual well-being among cancer patients, as well as identifying barriers to the integration of spirituality in healthcare

Thus, individuals who are currently undergoing or have undergone oncological treatment may exhibit a set of symptoms related to PTSD, as well as elements indicative of PTG, considering the

varied levels of suffering, difficulties, or impairments in different aspects of life. Moreover, despite not reaching a consensus in research, it is understood that sociodemographic data, illness perception, social support, and spirituality can be variables to be considered in studies assessing PTSD and PTG in this population. However, there is a recognized need to expand studies on the conditions and factors contributing to their occurrence. In response to this demand, the present study aimed to evaluate indicators and identify associated factors (illness perception, social support, and spiritual well-being) of PTSD and PTG in individuals undergoing cancer treatment.

2. Method

Participants

A cross-sectional study was conducted. The sampling was non-probabilistic by convenience, consisting of 74 individuals who went through oncological treatment, divided into two groups – 42 currently undergoing treatment (Group 1) and 32 post-treatment (Group 2). Inclusion criteria were: (a) having a cancer diagnosis; (b) going through oncological treatment for at least 6 months (Group 1) or having completed oncological treatment (Group 2); (c) adults aged 18 years or older. The exclusion criterion was patients with any impairment or difficulty that would interfere with their ability to respond autonomously to the instruments.

Regarding the sociodemographic characteristics of the participants, there was an average age of 51.44 years (SD = 14.88). The majority were female (77%; n = 57), in a stable relationship (54.40%; n = 41), with a completed high school education (36.50%; n = 27), and identified as Catholic (62.20%; n = 46). In terms of employment situations, they were predominantly active (27%; n = 20) or inactive/unemployed (27%; n = 20). In their clinical history, the majority had no disease remission (43.20%; n = 32), no presence of metastasis (86.50%; n = 64), had undergone surgery and chemotherapy (20.30%; n = 15) or only chemotherapy (20.30%; n = 15) as treatments, were assisted by the Brazilian Unified Health System (SUS) (56.80%; n = 64), diagnosed with breast cancer (43.20%; n = 32), without previous psychological counseling (60.80%; n = 45), and without previous psychiatric follow-up (86.50%; n = 64). Additionally, the group showed an equal rating for the personal assessment of cancer as a traumatic event, with 50% responding affirmatively (n = 37) and 50% negatively (n = 37).

Measures

Six instruments were used, described below in their format and standardization:

- Sociodemographic data sheet and assessment of clinical knowledge, including questions related to gender, age, marital status, education, employment status, information about cancer diagnosis, treatment, and remission, as well as history of psychological and/or psychiatric treatment;

- TSDChecklist - PCL-5 Questionnaire[24], adapted for the Brazilian population [25], it is a self-report questionnaire for PTSD, comprising 20 items based on diagnostic criteria that address factors related to re-experiencing, avoidance, numbing, and hyperarousal. The questionnaire uses a Likert scale ranging from 0 (not at all) to 4 (extremely), with an alpha reliability coefficient of 0.88. The items are divided into four criteria: Criterion B (α = 0.75), Criterion C (α = 0.62), Criterion D (α = 0.72), and Criterion E (α = 0.66). The PCL-5 is evaluated by summing the scores for each criterion defined according to DSM V. It is indicative of PTSD if the scores include at least one Criterion B symptom - re-experiencing (items 1 to 5), one Criterion C symptom - avoidance (items 6 and 7), two Criterion D symptoms - cognitive and mood alteration (items 8 to 14), and two Criterion E symptoms - arousal and reactivity (items 15 to 20). Symptoms are considered present only for items with a moderate to high intensity score (≥ 2)

- Brazilian version of the Post-Traumatic Growth Inventory – PTGI – B, it assesses PTG through 18 items (α = 0.92) organized into a multifactorial structure with five factors: relationship with others (α = 0.85); new possibilities (α = 0.79); personal strength (α = 0.75); appreciation of life (α = 0.72), and spiritual change (α = 0.79). Respondents use a 6-point Likert scale (0 to 5),

referencing the degree of changes experienced after a specific crisis[12]. For interpretation, an attempt was made to map PTG scores through quartile distribution, as established in this study: 0 to 22 points, low PTG; 23 to 45 points, moderate PTG; 46 to 67 points, high PTG; and 68 to 90 points, very high PTG.

- Functional Assessment of Chronic Illness Therapy- -Spiritual Well -Being (FACIT-Sp)[26], it assesses spiritual well-being and is a scale structured with 12 items (α = 0.87), covering two subscales: Meaning/Purpose, composed of items 1 to 8 (α = 0.89), and Faith, formed by items 9 to 12 (α = 0.92). The scale addresses existential aspects of spirituality and faith. The way these elements are expressed does not presuppose a belief in God, allowing for responses from agnostics and atheists. According to the authors, the FACIT-Sp is a consistent scale for measuring the spiritual well-being of individuals with cancer or chronic illness[27]. As a criterion for mapping spiritual well-being scores, a quartile distribution was employed: 0 to 12 points, low spiritual well-being; 13 to 24 points, moderate spiritual well-being; 25 to 36 points, high spiritual well-being; and 37 to 48 points, very high spiritual well-being.

- Brief Illness Perception Questionnaire (Brief- IPQ). Just like the original version, this one also consists of nine items structured based on the IPQ-R[28]. The Brief IPQ consists of two factors. Factor 1 measures emotional representation, described in the dimensions of consequence (item 1), identity (item 4), concern (item 5), and emotion (item 7), with α = 0.81. Factor 2 is the cognitive representation of the disease, consisting of individual control (item 2), treatment control (item 3), understanding of the disease (item 6), temporal (item 8), with α = 0.42. It is worth noting that, in the present research, there was an adaptation of the scale, reintroducing the temporal dimension (item 8), considering its importance in assessing the duration of the disease, and associated with the cognitive representation factor. Additionally, the assessment of causal representation (item 9) is done through a question in which patients report the three causal factors most associated with the etiology of their disease, according to their interpretation[31]. To map the perception of illness scores, the quartile distribution was considered: 0 to 20 points, low perception of illness; 21 to 40 points, moderate perception of illness; 41 to 60 points, high perception of illness; and 61 to 80 points, elevated perception of illness.

- Social Support Questionnaire (SSQ)[29]. This questionnaire allows the assessment of scores for the perceived number of support sources and satisfaction with the received social support. The SSQ consists of 27 questions, with each question requesting a response in two parts. In the first part, respondents should indicate the number of perceived social support sources (SSQ-N), and they can list up to nine possibilities (in addition to the none option), with an alpha of 0.94. In the second part, respondents should report their satisfaction with this support (SSQ-S), making a choice on a 6-point scale ranging from very satisfied to very dissatisfied, with α = 0.94[30]. Regarding the social support scores, they were analyzed in two ways: 1) the overall sum of satisfaction levels with the support provided, ranging from 6 to 36 points, interpreted through quartile distribution – 6 to 13 points, low satisfaction with social support; 14 to 21 points, moderate satisfaction with social support; 22 to 28 points, high satisfaction with social support; and 29 to 36 points, very high satisfaction with social support; 2) analysis of identifying the main individuals involved in this support.

Ethical and Data Collection Procedures

The project was approved by the Research Ethics Committee under report No. 4,576,757. This research was conducted in accordance with ethical standards, adhering to Resolution 466/12 of the Brazilian National Health Council, and with the appropriate free and informed consent of the patient.

The data collection period began in October 2021 and concluded in April 2022. Initially, participants were contacted at both a private clinic and a public service clinic to explain the research objectives and procedures and invite them to participate. Subsequently, data collection was carried out by a single researcher, in-person, individually, in a private location chosen by the participant or in the waiting room for appointments.

As a means of achieving greater access to participants and expanding the sample, in addition to in-person research, a virtual data collection method was also developed and made available. This involved creating a form containing the research instruments and detailed instructions for their completion. The form was designed using Google Forms and was sent directly to participants who had been contacted beforehand and were aware of the research.

3. Data Analysis

The data were analyzed using the statistical package SPSS (Statistical Package for Social Science) version 20, in five steps: (1) descriptive analysis of the sample; (2) descriptive analysis of the scales based on criteria established in the "instruments"; (3) comparisons of PTSD and PTG scores among participants with different sociodemographic characteristics, using Kruskal-Wallis and Mann-Whitney tests due to the non-normality of the data; (4) correlation analyses between PTSD and PTG scores and other variables (satisfaction with social support, spiritual well-being, and perception of illness) using the Spearman test due to the non-normality of the data; and (5) multiple linear regression with stepwise entry, with PTSD as the dependent variable and spiritual well-being and perception of illness as independent variables.

4. Results

Evaluations of PTSD Indicators

An average global sum of 23.01 points (SD = 14.72) was observed, with scores ranging from 0 (n = 1) to 57 (n = 1). Based on this sum according to criteria, a significant number of participants with an indication for PTSD were identified (n = 16; 21.60%), although the majority did not exhibit PTSD symptoms (n = 58; 78.37%).

Evaluations of PTG Indicators

An average global sum of 59.35 points (SD = 19.58) was identified on the PTG scale, with scores ranging from 1 (n = 1) to 88 (n = 3). It was observed that the majority of participants exhibited high (n = 32; 43.24%) or very high (n = 31; 41.89%) levels of PTG. Few participants scored at low (n = 4; 5.40%) or moderate (n = 10; 13.51%) levels. Subsequently, an analysis of each factor of the five constituents for an indication of PTG was conducted (Table 1).

Table 1. Assessment of factors for posttraumatic growth.

Factor	Amplitude	M	SD	Distribution in the sample	
				Present	Absent
1.Relationship with others	1-30	18.58	7.83	100% (*n* = 74)	0% (*n*= 0)
2. New possibilities	0-25	14.71	5.96	97.2% (*n* = 72)	2.7% (*n* = 2)
3.Personal strength	0-15	10.85	3.96	97.2% (*n* = 72)	2.7% (*n* = 2)
4.Appreciation of life	0-10	7.68	2.78	95.9% (*n* = 71)	4.0% (*n* = 3)
5.Spiritual change	0-10	7.40	2.84	97.2% (*n* = 72)	2.7% (*n* = 2)

Evaluations of the associated variables' indices.

Perception of illness.

An average of 34.67 (SD = 14.31) was found, with scores ranging from 9 (n = 1) to 69 points (n = 1). It was observed that the majority of participants have a moderate level (n = 35; 47.29%) or high level (n = 23; 31.08%) of illness perception.

Additionally, the domains involved in illness perception were assessed, all ranging from 0 to 10, with a higher average in terms of consequence and emotion, and a lower average for treatment control, as shown in the table below (Table 2).

Table 2. Assessment according to the domains of Illness Perception.

Domains of illness perception	M	SD
Consequence	6.51	2.96
Individual control	3.52	2.95
Treatment control	0.64	1.36
Identity	4.32	3.44
Concern	5.89	3.61
Understanding of the disease	3.71	3.32
Emotion	6.12	3.73
Temporal Dimension	3.93	3.82

Spiritual Well-being

An average overall sum of 39.36 points (SD = 8.04) was identified, with scores ranging from 8 (n = 1) to 48 (n = 12). A significant number of participants were found to have a high level (n = 19; 25.67%) and very high level (n = 52; 70.27%) of spiritual well-being. Few participants scored at a low level (n = 1; 1.35%) or a moderate level (n = 2; 2.70%).

Social Support

An average overall sum of 33.50 points (SD = 4.76) was identified, with scores ranging from 15 (n = 1) to 36 (n = 40). A high number of participants were observed to have a very high level of satisfaction with social support (n = 64; 86.48%). The remaining participants scored at a moderate level (n = 3; 5.40%) or a high level (n = 8; 8.60%). No one scored at a low level of social support.

Additionally, a qualitative analysis of responses regarding individuals who served as social support for these participants was conducted. Among the most frequently mentioned sources were family members - children, daughters, spouse, husband, mother, father, and siblings - as well as friends. The importance of God and healthcare professionals was also mentioned.

Comparison of PTSD and PTG with variables

Next, comparisons were made between PTSD and PTG scores among different groups of participants based on their sociodemographic and clinical data. In the comparisons of PTSD levels, there was no statistically significant difference between the groups in some analyzed variables: marital status, education, religion, employment status, type of cancer, between those with and without metastasis during treatment, between individuals who received assistance through the Brazilian public health system (SUS) and privately, individuals who did or did not have previous psychological support, individuals who did or did not have previous psychiatric support, and individuals currently undergoing cancer treatment and those who have completed their oncological treatment. Similarly, no differences were found in PTG scores in some variables: education, religion, type of cancer, between individuals with and without metastasis, individuals who did or did not have previous psychological support, individuals who did or did not have previous psychiatric support, and individuals currently undergoing cancer treatment and those who have completed their oncological treatment. Below, there are only the evaluations that stood out due to the presence of a statistically significant difference.

In comparisons of PTG scores by gender, a statistically significant difference was found [U = 277.500; $p < 0.05$], indicating that women (Mdn = 66.00) had higher PTG scores than men (Mdn = 50.00). Similarly, differences in PTSD scores by gender were observed [U = 321.000; $p < 0.05$], indicating that women (Mdn = 22.00) also had higher PTSD scores than men (Mdn = 13.00). In comparisons of PTG scores by marital status, a statistically significant difference was identified [X2(3) = 9.230; $p < 0.05$], signaling that single individuals (Mdn = 70.00) had higher PTG scores than widows (Mdn = 40.00).

Comparisons based on employment status revealed a statistically significant difference [X2(4) = 11.195; $p < 0.05$], indicating that inactive or unemployed individuals (Mdn = 72.00) had higher PTG scores than retired individuals (Mdn = 59.00). Another relevant finding was the statistically significant difference (U = 347.500, $p < 0.05$) in types of assistance. It was identified that individuals who received assistance through the Brazilian public health system (SUS) had higher PTG scores (Mdn = 70.00) than those who were assisted by private health insurance (Mdn = 57.00).

Correlation Analyses

In order to understand the relationships between the studied constructs, a Spearman correlation analysis was conducted between the PTSD and PTG scores and other variables (satisfaction with social support, spiritual well-being, and perception of illness) (Table 3). As a result, a moderate and significant negative correlation was observed between PTSD and spiritual well-being ($\rho = -0.417^{**}$; $p < 0.001$), indicating that spiritual well-being serves as a protective factor against the disorder. A positive, moderate, and significant correlation was also found between PTSD and perception of illness ($\rho = 0.608^{**}$; $p < 0.001$), suggesting that perceiving illness as a threat is a risk factor for an increase in PTSD scores. Among the analyzed variables, only satisfaction with social support did not show a significant correlation with PTSD ($p > 0.05$). Regarding PTG, no statistically significant correlation was found with the researched constructs. Similarly, no statistically significant correlation was observed between PTSD and PTG scores ($p > 0.05$).

Table 3. Correlation Analysis

	Variable	1	2	3
Total Sample	1. PTSD Values	1		
	2. Spiritual Well being	–.417**	1	
	3. Illness Perception	.608**	–.538**	1

Linear regression analysis

Subsequently, a multiple linear regression analysis with stepwise entry was conducted, considering PTSD as the dependent variable and spiritual well-being and perception of illness as independent variables. The assumptions of multiple linear regression were examined: multicollinearity (all VIFs were found close to 1.00, considered acceptable); absence of serial autocorrelation in the residuals (Durbin Watson: 1.749); and graphically verified normal distribution of residual values, as well as the presence of homoscedasticity[31-32].

As a result, a statistically significant model was observed [F (1.72) = 37.913; $p < 0.001$], with a coefficient of determination explaining 33.6% ($R^2 = 0.336$) of the variations in PTSD scores. It is noteworthy that, in the generated model, only perception of illness appeared as a statistically significant variable ($R^2 = 0.336$; standardized $\beta = 0.587$) and with greater predictive power in explaining the variations in PTSD scores (Table 4). This means that a more threatening perception of the disease is a predictor of PTSD. Finally, it is worth noting that, as PTG did not correlate with any variable, no regression analysis was conducted for this variable.

Table 4. Results of multiple linear regression analysis of Illness Perception for predicting post traumatic stress disorder (total sample):

	β	R^2	VIF	95% CI		*p*<
				LL	*UL*	
Illness Perception	.587	33.6%	1.00	.0409	.800	.001

Note.. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

5. Discussion

When assessing the PTSD value in the population currently undergoing or having completed oncological treatment, one must consider the variability of instruments used to evaluate PTSD. These variations can influence differences in prevalence estimates[11]. The data presented in this study confirms the understanding that cancer illness carries a significant degree of psychological impact[33]. Studies with cancer survivors identify that this population has a higher risk of developing PTSD, with 1.66 times more chances than individuals without a history of cancer[9].

The results presented in this study, which indicate a high level of PTG, especially in the dimension "appreciation of life," corroborate studies conducted with 540 Chinese patients undergoing treatment for lung cancer, which obtained an average PTGI-C score of 60.92 points[34] and with 65 women who have gone through breast cancer treatment, which found moderate to high levels of PTG in 88.5% of the sample[33]. These data reinforce the possibility of growth from facing adversities, such as cancer.

The development of a clearer and more realistic perception of the illness contributes to adaptation to the new context and, thus, enhances coping abilities[35]. On the other hand, studies reveal that if people perceive their illness as causing more negative consequences, as well as having a negative emotional impact, they may experience more anxiety and a greater sensation of symptoms.[36].

Regarding understandings about the perception of illness, such as cancer, it is understood that these may be pre-existing to the person's own illness, and may be so ingrained that, even after guidance or explanations, they are not modified. It is known that people formulate their perceptions about the disease according to their experiences acquired throughout their lives, which can guide their behavior and coping. In this sense, what the individual understands about the illness may or may not be consistent with the reality of treatment and illness, and it may still be conditioned by influences from their experiences prior to the illness[37].

With the results, it is possible to observe the significant number of participants who presented a high and very high level of spiritual well-being. It is considered that experiences during cancer treatment have the potential to affect daily routine, relationships and other aspects of life, contributing to the emergence of emotional symptoms related to depression, anxiety and stress. In this context, spirituality has significant effects on emotional health and becomes useful for coping with psychological suffering. The authors also point out that spirituality can enhance the restoration of tranquility and trust in the health care offered by professionals[38].

The present research also found a high level of satisfaction with social support, understanding that social relationships are present and strong in the participants' experiences. Social support originates from social networks based on positions and roles established in society, through kinship or emotional bonds, and provides support in the face of adversity[20]. For example, a study conducted with women with cancer who perceived their husbands as supportive, had contact with cancer survivors, and were satisfied with their family relationships, showed more PTG[18].

Comparison of PTSD and PTG with sociodemographic variables

The finding that women exhibit more PTG is consistent with other studies[14,16]. One hypothesis that justifies this data is that women tend to seek more help and feel more comfortable sharing their experiences with others, especially those who have gone through similar situations, while men may decide not to share feelings of sadness, fearing it would be perceived as a sign of failure[15,39].

Similarly, it was found that women have higher rates of PTSD. Despite the scarcity of Brazilian epidemiological data regarding the disorder by gender, the main findings suggest its higher prevalence among women. This could occur due to a combination of factors that make women more prone to being exposed to traumatic events at an earlier age. Additionally, authors reinforce the possibility that women may have a greater tendency to emit more palliative responses to stressors, given their greater neurobiological sensitivity, while men may have fight-or-flight responses[40].

The finding of lower rates of PTSD in married and widowed individuals may reflect the need for redefinition after a relationship, suggesting that beliefs about the world and oneself can be more flexible and subject to change[39].

The observation that inactive or unemployed individuals exhibit higher levels of PTG can be justified by the understanding that individuals open to new experiences are more likely to have a connection with personal growth. In other words, it is possible that, from this characteristic, there could be positive emotions and cognitions present in adverse situations. Consequently, these individuals have a better foundation for engaging in mechanisms of post-traumatic cognitive reflection and reconstruction[15].

Finally, it was identified that individuals receiving assistance from the Brazilian public health system, the Unified Health System – SUS, exhibited higher levels of Post-Traumatic Growth (PTG) than those assisted by private health insurance plans. The outcome of this analysis has led to several reflections and interpretations regarding the challenges of oncological treatment in the Brazilian public health system. Barriers to early diagnosis and access to treatment are perceived as significant obstacles in the public health context[41]. This reality highlights a hypothesis for interpreting this result. The population assisted by SUS, despite facing challenges, may have perceived the assurance of access and utilization of treatment, with the opportunity for a comprehensive and interconnected service provided by SUS. In this sense, there might be a favoring of the possibility of positive changes in some aspect of the experience of oncological treatment or a potential for a broader perspective in the face of a crisis. Thus, there is an emphasis on the need to drive and strengthen the practices and services offered by SUS to ensure access to proper healthcare assistance.

Correlation between PTSD and Spirituality

Regarding the negative, moderate, and significant correlation between PTSD and spiritual well-being, it is observed that the latter serves as a protective factor against the disorder. Spirituality may play a role during oncological treatment, aiding in dealing healthily with the concept of death by understanding it as a natural process of life. It supports the elaboration and redefinition of experiences and relationships. Such circumstances can be essential as protective elements against the development of psychological distress. Therefore, managing spirituality in the quality of life of oncology patients is based on understanding not only the physical impact of the disease and the psychological impact of the prospect of death but the total conception of their experiences and coping process, providing them with a sense of purpose[42].

Correlation between PTSD and illness perception

The analysis of the results revealed a positive, moderate, and significant correlation between PTSD and illness perception, suggesting that perceiving it as a threat is a risk factor for the disorder. This relationship has significant theoretical and practical implications. The identified link between PTSD and illness perception supports the idea that subjective aspects related to illness should be assessed by healthcare professionals to understand patients' suffering during treatment and even after its completion, during the maintenance and control period of the disease.

The relationship between PTSD and illness perception is confirmed in a study involving young survivors of childhood cancer. The authors found that negative emotional representations of cancer are nearly inevitable due to its seriousness and the present risk of death. However, they emphasize that excessively negative representations and doubts about the disease can potentially amplify the emergence of PTSD symptoms[10].

Regression analysis between PTSD and illness perception

The regression analyses reinforced illness perception as a predictor for PTSD. Thus, it is understood that the way an individual cognitively and emotionally represents their illness, perceiving it as threatening, can contribute to PTSD symptoms related to their current life in aspects that resemble the experience of the disease.

Furthermore, dimensions of illness perception, such as Emotional Representation and Coherence of the Disease, were predictors of reexperiencing symptoms of PTSD. Confirming these findings, the study with young survivors of childhood cancer revealed that those who feel

fear, anger, anxiety, and believe they have little understanding of the disease, recall or have more disturbing dreams about the experience of childhood cancer[10].

Despite the consistent data regarding the presence of PTSD in the oncological population, it is important to note that the present study was conducted during the period still marked by the COVID-19 pandemic. Therefore, it is necessary to emphasize the impact of this socio-environmental context on the reality of the studied population. With the virus's ability to spread, changes in social dynamics became essential, including the establishment of population quarantine and isolation of the infected. Numerous studies have indicated that these transformations are a stressor with the potential to impact the mental health of the population[35]. The psychological consequences of the pandemic have led to the development and intensification of psychiatric signs and symptoms. Studies indicate that the prevalence rate of psychological disorders such as clinically significant depression (32.5%), anxiety (31.5%), PTSD (28.2%), and fear of cancer progression/recurrence among patients (67.4%) remained at significant levels during the COVID-19 pandemic[43].

6. Conclusions

This study allowed for the analysis of stress and post-traumatic growth in the population that has or had cancer, as well as the identification of associated factors. It was found that a significant portion of the studied sample exhibited indicative levels for PTSD, as well as a high level of post-traumatic growth. Other notable data emerged in the indices of other studied variables. Both social support and spiritual well-being showed high levels in this population. It was also identified that the sample indicated, with moderate intensity, cancer as a potential threat to life.

Correlations were found between PTSD and the variables of spiritual well-being and illness perception, leading to the inference that spiritual well-being is a relevant factor in the possibility of PTSD development. Additionally, perceiving the illness as a threat was identified as an attention-worthy factor associated with an increased PTSD index. Another significant finding was that illness perception emerged as the variable with the greatest predictive power in explaining variations in PTSD indices, defining itself as a risk factor for the disorder's indices and symptoms. Consequently, it is apparent that how individuals cognitively and emotionally represent their illness may contribute to PTSD symptoms.

This study has some limitations, such as the heterogeneity of participants with different types of cancer, in various conditions and stages of treatment, and the use of cross-sectional data collection. Therefore, for future studies, it is suggested to determine and specify a more homogeneous portion of the population with cancer, use diverse methods and techniques, such as longitudinal research, and employ precise and varied instruments for assessment. Despite these limitations, the relevance of the theme is emphasized when it proposes, as a research focus, the process of developing PTSD and PTG in the oncological population. It also evaluates the influence of variables like spirituality and illness perception in this context, with important theoretical and practical implications.

Moreover, the reflections addressed in this study resonate with current discussions surrounding the topic. The recognition and identification of factors related to PTSD and PTG can contribute to the development of targeted interventions for preventing health issues. It can also support actions that minimize the effects associated with the diagnosis and treatment of cancer. Therefore, it becomes essential to broaden knowledge about ideas and concepts related to the processes involved in oncological treatment as a means of promoting care and assistance to this population.

7. References

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