

Cancer and its Psychological Effects on Families

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ABSTRACT

Background: Cancer stands as the second-leading global cause of mortality. This malignancy exerts a profound impact not only on the afflicted individuals but also significantly affects the emotional, financial, social, and occupational well-being of their family and friends. Approximately 80% of in-home care services are shouldered by family caregivers, imposing a substantial burden on them, leading to various adverse physical, psychological, financial, social, and occupational consequences, ultimately deteriorating their quality of life. Despite the awareness among physicians regarding the strain on caregivers, they often pay minimal attention to caregivers' comprehension of the disease, a primary contributor to the psychological imbalances observed in caregivers.

Objectives: This cross-sectional study is aimed at investigating the manifestations of depression, anxiety, and post-traumatic stress disorder (PTSD) among 139 family members of cancer patients in Tbilisi, Georgia, Hyderabad, India, and known family members of cancer patients from the UAE. Furthermore, the study evaluates the level of health literacy among family caregivers of cancer patients and its influence on the management of symptoms related to depression, anxiety, and stress disorders.

Methods: Data collection was executed utilizing the Patient Health Questionnaire (PHQ-9) scale for depression, the Generalized Anxiety Disorder 7 (GAD-7) scoring system for anxiety, and the International Trauma Questionnaire (ITQ) for PTSD. The questionnaire incorporated an assessment of health literacy, encompassing inquiries concerning the comprehensibility of the caregivers' understanding of the cancer patient's diagnosis, management strategies, and prognosis. Caregivers were also evaluated on their competence in managing symptoms of depression, anxiety, and PTSD based on the information provided by physicians.

Results: Among the participants, 42.5% (n=59) exhibited moderate to severe levels of depression according to the PHQ-9 scale. Likewise, moderate to severe levels of anxiety, as per the GAD-7 scoring system, were found in 36.7% (n=51) of the participants. Regarding the ITQ, among the 139 respondents, only 20.8% (n=29) displayed no re-experiencing trauma symptoms; 18.7% (n=26) reported no symptoms of avoidance; 13.7% (n=19) did not exhibit symptoms of current threat, and 12.2% (n=17) experienced no functional impairment due to stress. A substantial 91.3% (n=127) of family caregivers reported receiving adequate information from treating physicians regarding the diagnosis and management of the disease. Notably, among the 71 participants who comprehended the explanations very well, 75% (n=53) were proficient at managing their symptoms.

Conclusions: The education and emphasis on the well-being of patients and caregivers should be a paramount responsibility of healthcare professionals. Healthcare systems must strive to recognize the significance of training caregivers and extend professional support to them in order to mitigate the development of depression, anxiety, and stress disorders. Extensive research in the field of psycho-oncology is imperative for the early recognition and prevention of psychological illnesses among caregivers.

Keywords: Anxiety; cancer; caregiver burden; depression; post-traumatic stress disorder; psycho-oncology.

INTRODUCTION

Cancer, a global health concern, ranks as the second-leading cause of mortality worldwide and exerts a substantial economic burden, estimated at 1.16 trillion dollars annually. Moreover, according to the World Cancer Research Fund International (WCRF), the year 2020 witnessed an estimated 18.1 million cancer cases worldwide, with an annual mortality rate of 10 million, notably with 70% occurring in low- to middle-income countries.¹ Beyond the direct impact on individuals, cancer profoundly influences the well-being of family and friends, bestowing upon them significant stress and challenges.¹ The diagnosis of cancer, coupled with the experience of watching a loved one grapple with the disease and endure pain, creates traumatic events that caregivers must

confront. Consequently, a cancer diagnosis reverberates throughout the family unit, affecting their physical and mental health. Therefore, it is imperative to undertake an in-depth exploration of these ramifications.¹

With the escalating incidence of cancer diagnoses and the widespread prevalence of home-based cancer care services, it is increasingly evident that cancer diagnosis profoundly affects both patients and their family members, at times even more so than the patients themselves.² Family caregivers shoulder approximately 80% of the burden of home-based care, which imposes a substantial responsibility on them.² Whether it involves tending to the patient's needs, managing financial matters, providing physical and emotional support, or accommodating their professional



careers, these caregivers are tasked with many responsibilities, including symptom monitoring, medication administration, and support during hospital visits and chemotherapy sessions.² Moreover, they play a pivotal role in preserving the psychological equilibrium of the patient. Regrettably, studies have shown that family caregivers are often ill-prepared for the demands of home-based caregiving and receive inadequate education before the patient's hospital discharge.³ Moreover, the caregivers frequently experience an imbalance between their caregiving responsibilities and their own needs, leading to various adverse physical, psychological, financial, social, and occupational consequences that detrimentally affect their quality of life.⁴

Remarkably, research has revealed that adults with cancer and their family caregivers share a similar burden of anxiety and depression.⁵ A study conducted by Geng et al. in 2018 reported a prevalence of 42.30% for depression and 46.55% for anxiety among this population.⁶ Factors positively associated with depression in caregivers encompass the patient's condition, caregiving burden, duration of caregiving, spouse caregivers, unemployed caregivers, caregivers with chronic diseases, poor caregiver sleep quality, caregiver avoidance, financial problems, and female gender. Conversely, factors such as the overall quality of life of the caregiver, pre-loss grief, caregiver education level, caregiver age, caregiver sense of coherence, and caregiver's bond with the patient were negatively associated with depression.⁶ Additionally, research indicates that as the caregiving burden and daily patient care duration increase, so does the level of anxiety and depression.⁷ Notably, a prior study reported possible post-traumatic stress disorder (PTSD) in 20% of survivors and 35.5% of caregivers, with probable PTSD in 11.0% of patients and 15.6% of caregivers. Symptoms of PTSD among caregivers were linked to a history of depression and a closer relationship with patients.⁸ Regrettably, the mental health of family caregivers is frequently overlooked, and they often succumb to anxiety, depression, or PTSD.⁹ Our study aims to assess the severity of these symptoms and explore how different family members in various age groups may be affected differently by the disease. Younger adults may lack mature coping mechanisms and face additional stressors, such as demanding academic lives. Similarly, older adults, men, and women may experience distinct stressors and emotional intelligence levels, all of which can influence the prevalence and manifestation of these symptoms.

Most patients and families desire to understand their prognosis, as having more information about their cancer diagnosis aids in coping.¹⁰ However, despite physicians' awareness of the burden and stress experienced by caregivers, they often pay minimal attention to the caregivers' comprehension of the disease, a significant contributor to the psychological imbalances observed in

caregivers.¹¹ A study by Easley et al. in 2017 emphasizes the need for improved communication, collaboration, and education to enhance the role of family physicians in cancer care. Barriers such as communication issues, lack of role clarity among healthcare providers, inadequate training, and systemic issues currently hinder the full potential of family physicians in cancer care.¹² Our study seeks to underscore the critical role of physicians in supporting caregivers from the moment of diagnosis until the end of the cancer journey.

METHODS

A cross-sectional survey-based research study focused on family caregivers of adult cancer patients undergoing treatments. The study subjects were selected from Kechinashvili Hospital, Jerarsi Clinic, Mardaleishvili Medical Center in Georgia, and palliative care centers in Hyderabad, India. Participants from the United Arab Emirates (UAE) were included in the study. Data collection took place over four months, from August 2022 to November 2022, with the subsequent two months allocated for manuscript preparation. The study comprised family members of cancer patients primarily receiving one of the four major treatment modalities: chemotherapy, surgery, radiotherapy, and palliative care. Family caregivers included biological first-degree relatives (i.e., parents, siblings, children) or spouses recognized by the patients as the primary providers of informal and unpaid care. Exclusion criteria encompassed caregivers with diagnosed cognitive impairment, a history of psychiatric or neuropsychological disorders, individuals under 18 years of age, and non-blood-related family members. The study was also promoted on social media platforms such as Facebook and Instagram, as well as specific cancer support groups, with no incentives for participation.

Sample size

The study employed a non-probabilistic purposive sampling method in hospitals offering cancer care services, with 139 subjects in total.

Data collection

Both the family caregiver and the patient received an explanation of the study's objectives. Subsequently, they were requested to provide informed consent. A maximum of two family caregivers per patient was enrolled in the study. Patient data were primarily derived from their medical records, while caregivers completed a questionnaire in either Georgian or English. The questionnaire included the Patient Health Questionnaire (PHQ-9) for depression, the Generalized Anxiety Disorder 7 (GAD-7) for anxiety, and the International Trauma Questionnaire (ITQ) for PTSD. The ITQ assessed various core features of PTSD, including avoidance, re-experiencing trauma, sense of current threat, and

functional impairment. Psychiatrists in Georgia currently recommend these questionnaires.

Additionally, the questionnaire inquired about health literacy, explicitly focusing on how caregivers understood the cancer patient's diagnosis, management strategies, and prognosis. Based on physicians' explanations, caregivers were also evaluated on their ability to manage symptoms of depression, anxiety, and PTSD. The questionnaires were designed to be straightforward and time-efficient.

Statistical analysis

The study calculated the prevalence of depression, anxiety, and stress disorder symptoms within the sample. Data analysis was conducted using GraphPad Prism version 9, employing various statistical methods. An unpaired t-test was used to compare the impact of anxiety and depression across different age groups and genders. Pearson's correlation coefficient was utilized to determine the relationship between depression and anxiety scores, the year of disease diagnosis, the treatment type, and the extent of metastasis. Chi-square analysis was employed to compare qualitative data, examining the levels of depression and anxiety among biological and different age groups. A p-value less than 0.05 was considered statistically significant.

RESULTS

Study respondents

This study observed the development of symptoms of depression, anxiety, and PTSD in 139 participants who were confirmed as family members of cancer patients diagnosed with various cancers, including brain, throat, oral cavity, breast, bone, lung, gastric, colorectal, pancreatic, urinary tract, endometrial, cervical, testicular, prostate, lymphoma, and leukemia. Among the 139 study participants, 51.8% (n=72) were males, and 48.2% (n=67) were females. All participants were categorized into two age groups: young adults (18-25 years) and older adults (26 years and above). Within this classification, 23% (n=32) were young adults, and 77% (n=107) were older adults.

Depression

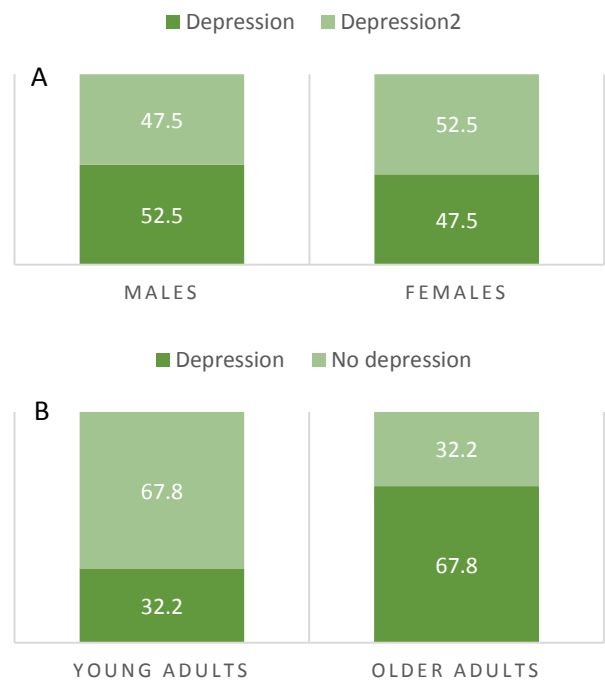
The severity of depressive symptoms in participants was assessed using the PHQ-9 quick depression assessment. Among the 139 participants, 16.5% (n=23) reported experiencing no depressive symptoms, while 41.0% (n=57) experienced mild depression, and 23.7% (n=33) had moderate depression. Moreover, 15.1% (n=21) experienced moderately severe depression, and 3.7% (n=5) had severe depression.

Out of the 139 participants, 42.5% (n=59) had a depression score greater than or equal to 10, indicating moderate, moderate-severe, or severe depressive symptoms.

Among the 59 participants with moderate to severe depressive symptoms, 52.5% (n=31) were males, and 47.5% (n=28) were females. Figure 1 shows no statistical difference in the frequency of depressive symptoms between males and females (chi-square = 0.0227; p-value = 0.8802).

Out of the 59 study participants with moderate to severe depressive symptoms, 32.2% (n=19) were young adults between the ages of 18-25, while the remaining 67.8% (n=40) were older adults aged 26 and above. Figure 1 indicates an increased frequency of depressive symptoms among older adults compared to younger adults, though not statistically significant (chi-square = 4.877; p-value = 0.0272).

FIGURE 1. Frequency (%) of depressive symptoms among all age males and females (A) and adults 18-25 years of age and older adults above 26 years of age (B)



Anxiety

Symptoms of anxiety were evaluated using the GAD-7 self-administered patient anxiety scoring scale. Among the 139 participants, 10% (n=14) reported minimal anxiety symptoms, while 51.7% (n=72) experienced mild anxiety, and 26.7% (n=37) had moderate anxiety. Additionally, 11.6% (n=16) experienced severe anxiety symptoms.

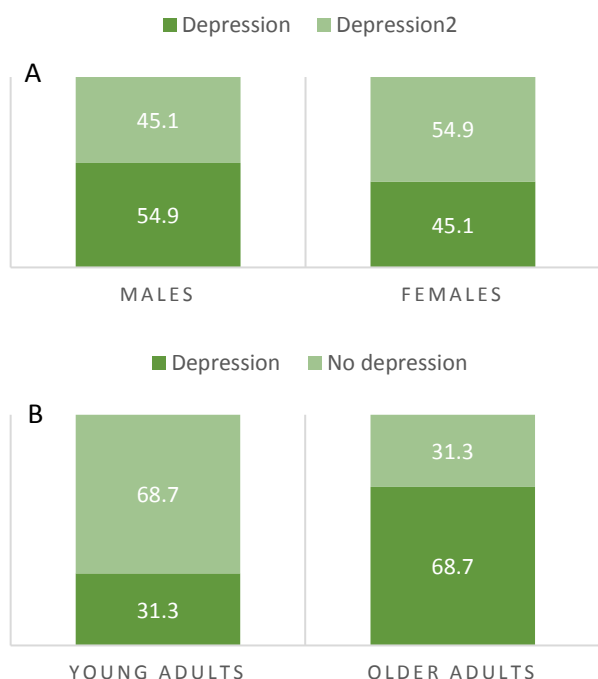
Out of the 139 participants, 36.7% (n=51) had an anxiety score greater than or equal to 10, indicating moderate, moderate-severe, or severe levels of anxiety symptoms.

Among the 51 participants with moderate to severe anxiety symptoms, 54.9% (n=28) were males, and 45.1% (n=23) were females. Figure 2 demonstrates no statistical

difference in the frequency of anxiety symptoms between males and females (chi-square = 0.3107; p-value = 0.5772).

Out of the 51 study participants with moderate to severe anxiety symptoms, 31.3% (n=16) were young adults between the ages of 18 and 25, while the remaining 68.7% (n=35) were older adults aged 26 and above. Figure 2 shows an increased frequency of anxiety symptoms among older adults, although it is not statistically significant (chi-square = 3.170; p-value = 0.0750).

FIGURE 2. Frequency (%) of anxiety symptoms among all age males and females (A) and adults 18-25 years of age and older adults above 26 years of age (B)



PTSD (Post-Traumatic Stress Disorder)

The International Trauma Questionnaire (ITQ) was employed to assess various domains of PTSD, including re-experiencing, avoidance, sense of current threat, and functional impairment. The results showed that the majority of subjects (87.7%, n=122) reported experiencing at least one domain of PTSD. Out of the 139 participants, 20.8% (n=29) reported having no symptoms of re-experiencing trauma, while 18.7% (n=26) reported no symptoms of avoidance. Moreover, 13.7% (n=19) did not experience symptoms of the current threat, and 12.2% (n=17) had no functional impairment due to stress.

Effect of health literacy on the management of symptoms of depression, anxiety, and PTSD by caregivers

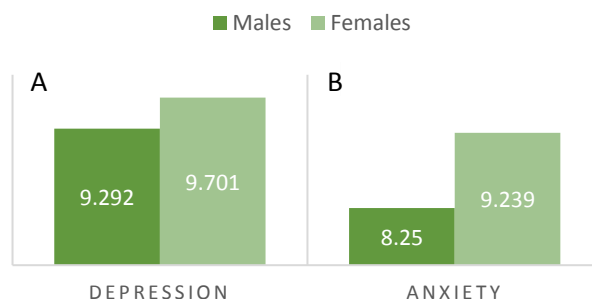
Caregivers were asked if the treating physicians adequately explained information regarding the cancer diagnosis, treatment plan, and prognosis.

Out of the 139 caregivers in the study, 91.3% (n=127) of family caregivers reported receiving information about the diagnosis. In contrast, 8.7% (n=12) reported receiving no explanation from the treating physician regarding the disease's diagnosis, treatment strategy, or prognosis. Among the 127 study participants who received explanations from treating physicians, 32.2% (n=41) partially understood the explanation, 56% (n=71) understood the explanation very well, and 11.8% (n=15) understood the explanation exceptionally well. Overall, 67.8% (n=86) understood the explanation of the disease's diagnosis, treatment, and prognosis very well.

Among the 41 participants who partially understood the explanation, only 9.7% (n=4) expressed that they were able to manage their symptoms of depression, anxiety, and PTSD very well. Among the 71 participants who understood the explanation, 75% (n=53) reported managing their symptoms very well.

An independent sample t-test was conducted to compare the mean depression scores between males and females (mean = 9.292 for males and mean = 9.701 for females). The results showed no statistically significant difference (t = 0.4850; two-tailed p-value = 0.6285; 95% CI = -1.261 to 2.081; SEM = 0.8450; R2 = 0.001) (Fig.3)

FIGURE 3. T-test comparing mean depression (A) and anxiety (B) scores among males and females

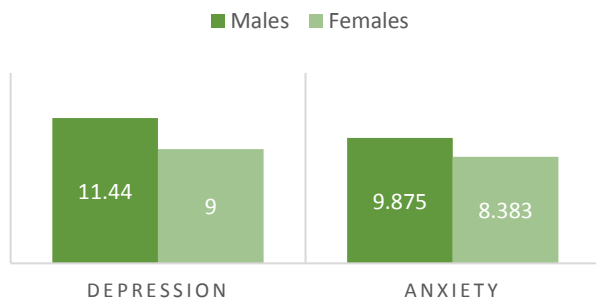


Further analysis revealed no statistical difference in the mean depression and mean anxiety scores between males and females.

Additionally, an independent sample t-test was conducted to compare the mean depression score between young adults (mean = 11.44) and older adults (mean = 9.00), which yielded a statistically significant difference (t = 2.456; two-tailed p-value = 0.0153; 95% CI = -4.400 to -0.4750; SEM = 0.9924; R2 = 0.042) (Fig. 4).

Similarly, an independent sample t-test was conducted to compare the mean anxiety score between young adults (mean = 9.875) and older adults (mean = 8.383). The results showed no statistically significant difference (t = 1.829; two-tailed p-value = 0.0696; 95% CI = -3.105 to 0.1209; SEM = 0.8156; R2 = 0.023) (Fig.4).

FIGURE 4. T-test comparing mean depression (A) and anxiety (B) scores among young adults (18-25 years of age) and older adults (above 26 years of age)



In summary, the mean depression score was higher among young adults and was statistically different between young adults and older adults. However, there was no statistical difference in the mean anxiety score between young adults and older adults.

Table 1 displays the association between caregivers' depression and the sociodemographic and illness characteristics of the patients. The table includes Pearson correlation 'r' values, demonstrating positive associations between depressive symptoms and the stage of cancer, year of diagnosis, and the type of cancer treatment received primarily.

TABLE 1. The association between Caregivers' Depression and the socio-demographic and illness characteristics of the patients

Variable values	Moderate to severe depression	No depression	Test	P value
Age (years)				
Young adults (18-25 years of age)	13.67% (n=19)	9.35% (n=13)	2.456 ^a	0.0153 (s)
Adults (above 25 years of age)	28.77% (n=40)	48.20% (n=67)		
Sex				
Male	22.30% (n=31)	29.49% (n=41)	0.4850 ^a	0.6285 (ns)
Female	20.14% (n=28)	28.05% (n=39)		
Cancer stage				
Metastasis	15.82% (n=22)	6.47% (n=9)	0.3523 ^b	<0.0001 (s)
No metastasis	26.61% (n=37)	51.07% (n=71)		
Date of diagnosis				
More than a year	20.14% (n=28)	12.94% (n=18)	0.1932 ^b	0.0113 (s)
Less than a year	22.30% (n=31)	44.60% (n=62)		
Treatment type				
Chemotherapy	24.46% (n=34)	28.05% (n=39)	0.0411 ^b	0.3152 (ns)
Surgery	9.35% (n=13)	17.98% (n=25)		
Radiation	5.03% (n=7)	8.63% (n=12)		
Palliative	3.59% (n=5)	2.87% (n=4)		

Explanations: a, t-test; b, Pearson r, (s) significant, (ns) nonsignificant

The association between caregivers' anxiety and the sociodemographic and illness characteristics of the patients are displayed in Table 2.

TABLE 2. The association between caregivers' anxiety and the sociodemographic and illness characteristics of the patients

Variable values	Moderate - severe anxiety	No anxiety	Test	P value
Age (years)				
Young adults (18-25 years of age)	11.51% (n=16)	11.51% (n=16)	1.829 ^a	0.696 (ns)
Adults (above 25 years of age)	25.17% (n=35)	51.80% (n=72)		
Sex				
Male	20.14% (n=28)	31.65% (n=44)	1.432 ^a	0.1543 (ns)
Female	16.54% (n=23)	31.65% (n=44)		
Cancer stage				
Metastasis	14.39% (n=20)	7.91% (n=11)	0.303 ^{7b}	0.0003 (s)
No metastasis	22.30% (n=31)	55.40% (n=77)		
Year of diagnosis				
More than a year	16.54% (n=23)	16.54% (n=23)	0.201 ^{4b}	0.0174 (s)
Less than a year	20.14% (n=28)	46.76% (n=65)		
Treatment type				
Chemotherapy	19.42% (n=27)	33.09% (n=46)	0.065 ^{52b}	0.4435 (ns)
Surgery	8.63% (n=12)	18.70% (n=26)		
Radiation	5.75% (n=8)	7.91% (n=11)		
Palliative	2.87% (n=4)	3.60% (n=5)		

Explanations: a, t-test; b, Pearson r, (s) significant, (ns) nonsignificant

DISCUSSION

This cross-sectional study, conducted over 6 months, involved 139 participants, shedding light on the prevalence of anxiety, depression, and PTSD among family members of individuals diagnosed with oncological diseases. While current studies predominantly emphasize the psychological needs of patients and healthcare providers in oncology departments, the mental well-being of primary caregivers for oncology patients often remains unexplored.¹¹ The results of this study provide insights into the significant impact on subjects across Georgia, India, and the United Arab Emirates. The study achieved a relatively equal representation of both males and females. However, older adults (above 25 years) had a higher response rate than young adults (aged 18-25). Notably, symptoms of depression were more prevalent than symptoms of anxiety.

In this study, significant symptoms of moderate-severe and severe depression were identified in 42.5% (n=59) of the participants. Depression often arises as a consequence of caregiving for a cancer patient and may equal or exceed the depressive symptoms experienced by the patient and is directly connected to the level of quality of life.^{13,14} The

findings of this investigation appear to exceed the 30% prevalence rate discovered in a study by Grunfeld et al.¹⁵ The higher prevalence in our study could be partly attributed to the lack of psychological support available in healthcare facilities within the demographic regions studied. Due to time constraints, this aspect could not be examined further. Specifically, 24.69% of the sample (n=24) exhibited symptoms consistent with severe depression, while 29.86% of the sample (n=29) had symptoms consistent with moderate depression. No significant difference was established between males and females in their experience of these symptoms. However, a stark difference was noted in the prevalence and impact of these symptoms across different age groups. A higher number of older adults experienced depression symptoms compared to younger adults (aged 18-25). This discrepancy may be partly explained by the higher level of involvement of older adults in caregiving, as younger adults are often shielded from these responsibilities, both emotionally and physically. This trend is statistically reinforced by the higher response rate from older adults in this study. Interestingly, a reversal of this trend was noted when analyzing the severity of symptoms, with younger adults experiencing more severe symptoms of depression and a higher calculated Mean depression score compared to older adults. This may be attributed to the relative lack of mature coping mechanisms and available support for younger individuals.

According to this study, 36.7% (n=51) of the family members primarily responsible for providing care to cancer patients displayed substantial anxiety symptoms. Specifically, 11.6% (n=16) exhibited severe anxiety symptoms, while moderate anxiety symptoms were present in 26.7% (n=37) of participants. These findings align with Western research that found 13% of caregivers exhibited severe symptoms of anxiety disorders.¹⁶ Similar findings were reported in a study of wives of head-and-neck cancer patients, where 15.5% of the women experienced symptoms severe enough to be categorized as an anxiety condition.¹⁷ Among the 51 participants, 54.9% (n=28) were male, and 45.1% (n=23) were female. Therefore, it can be concluded that both males and females were similarly affected by symptoms of anxiety. Gender does not appear to be a predilection for these symptoms.

The majority of subjects (87.7%, n=122) reported experiencing at least one domain of PTSD, with most of them experiencing some level of impairment in daily life while re-experiencing trauma was less common.

The management of symptoms of psychological imbalance depends on the caregiver's educational background and understanding. The research indicated that most caregivers received fairly good explanations from their physicians regarding the disease. However, receiving a clear explanation alone was insufficient. The results demonstrated that, in addition to receiving explanations, an

excellent understanding of the disease and its progression was necessary to manage psychological symptoms effectively. Caregivers who received a good explanation but only partially understood it struggled to cope with their symptoms. A previous study reported that most family caregivers faced significant challenges in managing the side effects of chemotherapy and expected healthcare providers to provide them with more information about these side effects.¹⁸ A profound understanding of the disease, its progression, treatment complications, and potential side effects allows caregivers to be better prepared and seek appropriate interventions to mitigate the severity of symptoms. Consequently, providing training, education, and healthcare support to caregivers can improve both the quality of caregiving and the quality of life for caregivers. Implementing strategies within healthcare systems to alleviate the impact of formal and informal caregiving can improve caregiver and patient outcomes.¹⁹ Identifying and integrating caregivers into patient care, establishing in-hospital care teams, providing resources about support groups, and regularly screening caregivers for psychological imbalances using self-administered questionnaires can reduce the overall burden and stress on caregivers; decrease morbidity, mortality, and the associated financial burden stemming from both somatic and psychological illnesses.

This study is subject to several limitations. Firstly, the small sample size limited the statistical power and generalizability of the study, as the study population was derived from a few centers across three different countries. Due to time constraints, variables such as culture, religion, socioeconomic status, marital status, literacy rates, and demographic information could not be measured or correlated. The structural differences in societies and healthcare systems across these countries could further influence the outcomes but were not explored in this study. Additionally, the study's cross-sectional nature precluded the investigation of the direction of factors. Correlations between the progression of symptoms experienced by caregivers and the progression of a patient's disease could not be examined.

Moreover, the general health status of caregivers could not be determined, which could impact the severity of symptoms and place-specific individuals at higher risk. Nevertheless, the information from this study can be readily applied in clinical settings to help healthcare professionals identify caregivers at risk of emotional and psychological disorders and address questions about the effects of depression on the family. Interventions aimed at alleviating the negative psychological consequences of cancer should focus on both the patient and family caregivers. These individuals should receive comprehensive information about their illnesses and be diagnosed and treated with care. Strategies to reduce the overall burden and stress on

caregivers can lead to improved caregiver and patient outcomes.

CONCLUSIONS

In addition to addressing the mental well-being of cancer patients, it is imperative to prioritize the mental and emotional health of caregivers. The results of this study underscore that a noteworthy portion of caregivers encountered symptoms of psychological distress, encompassing depression, anxiety, and PTSD. These symptoms were found to be more common in older individuals compared to their younger counterparts. Participants highlighted the significance of receiving clear explanations from their healthcare providers and comprehending the disease's progression in effectively managing their symptoms. Our healthcare systems need to recognize the importance of equipping caregivers with appropriate training and extending professional support to them. By doing so, we can proactively mitigate the development of depression, anxiety, and stress disorders among caregivers.

AUTHOR AFFILIATION

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