Navigating Stress and Growth: The Role of Social Support Among Caregivers of Cancer Patients in Morocco

Abstract

This study utilized a quantitative approach to examine the relationship between social support and the experiences of stress and growth among caregivers of cancer patients in Morocco. Employing a cross-sectional design, data were gathered from caregivers using validated measures of perceived stress, social support, and post-traumatic growth. Regression analyses demonstrated that higher levels of emotional and instrumental social support were significantly associated with reduced stress and increased post-traumatic growth among caregivers. These findings highlight the protective role of strong social support networks in alleviating caregiving stress and fostering positive psychological outcomes. The study underscores the need for interventions aimed at strengthening social support systems for caregivers, particularly within the Moroccan context, where cultural and social dynamics play a significant role in caregiving experiences.

Keywords: Caregivers, cancer, social support, stress, post-traumatic growth

1.Introduction

According to the latest global cancer statistics, cancer remains a highly prevalent and devastating illness, with an estimated 20 million new cases and 9.7 million deaths reported worldwide in 2022 (Bray et al., 2024). Lung cancer was the most commonly diagnosed form, accounting for approximately 2.5 million new cases, followed by breast cancer (2.3 million) and colorectal cancer (1.9 million) (Bray et al., 2024). Recent data indicates that the cancer burden in Morocco is equally alarming, with cancer being the second leading cause of

mortality in the country. According to Obtel et al., (2015)The most prevalent cancer types among Moroccan men are lung and prostate, while breast and cervical cancers are the predominant malignancies in women. Additionally, a substantial proportion of breast and cervical cancers in Moroccan women are diagnosed at advanced stages, specifically stages II and III. These observations align with findings from a previous study that identified breast cancer as the most frequent malignancy affecting women in the broader North African region. (Belbaraka et al., 2022).

Beyond the physical toll, the cancer experience entails significant psychological and social consequences that cannot be overlooked. Not surprisingly, studies have found that patients with cancer frequently grapple with mental health issues such as depression and anxiety disorders. (Medicine, 2008). In their research about long term mental health implications of cancer patients, Forbes et al., (2024) indicated that individuals diagnosed with cancer face an elevated risk of developing anxiety and depression, a risk that persists even more than five years after their initial diagnosis. For instance, patients with lung cancer are nearly three times more likely to develop these mental health issues compared to those without cancer. Corroborating the findings from the referenced study (Forbes et al., 2024), various cancer types demonstrate a substantially heightened risk of suicide and non-fatal self-harm, particularly among those with cancers linked to poor prognoses, such as lung and pancreatic malignancies. Furthermore, the investigation uncovered that 17 out of the 20 examined cancer types exhibited elevated rates of self-harm relative to individuals without a cancer diagnosis. Research indicates that even after completing cancer treatment, a substantial proportion of patients, estimated around 35%, continue to experience significant psychological distress (Krok et al., 2024). Furthermore, a key psychological challenge for many post-treatment cancer patients is the fear of their cancer recurring, which affects a significant number of individuals who have completed their cancer treatment.

The pervasive impact of cancer inflicts a substantial burden on individuals, households, and healthcare systems, manifesting in extensive physical, emotional, and financial ramifications that traverse patients, their loved ones, and the broader healthcare landscape. Research corroborates that the psychological toll of cancer transcends the patient, profoundly affecting the mental health and well-being of caregivers and family members. Within the Moroccan context, where healthcare infrastructure and access to high-quality cancer care remain constrained, the onus of caregiving typically falls upon family members, who must navigate the multifaceted challenges of supporting a loved one through this illness.

Numerous studies have demonstrated that caregivers frequently experience substantial emotional distress, often feeling ill-equipped to handle the profound psychological toll that a loved one's cancer diagnosis can have on both the patient and themselves. As they navigate the challenges of supporting a loved one through the cancer journey, caregivers often struggle with feelings of anxiety, depression, and burnout. This is evidenced by a study (Goldzweig et al., 2019) that explored the emotional toll on spousal caregivers of older cancer patients, which found that 16.5% experienced clinical depression and 28% experienced distress. Studies (Goldzweig et al., 2019) (Northouse et al., 2012) suggest that patients and caregivers react to cancer as an "emotional system," with their emotional responses being interrelated. (Northouse et al., 2012) When one is distressed, the other is likely to be as well. (Caregivers of Cancer Patients, 2014) emphasizes the challenge of providing care and support while managing one's own needs and feelings. The stress can lead to both physical and psychological effects, and neglecting self-care can hinder the ability to care for others. This underscores the intensity of the caregiving experience, which can be both deeply challenging and surprisingly transformative. Emerging from this crucible of stress and adversity can be a process of post-traumatic growth, where individuals discover new strengths, deepened relationships, and a renewed appreciation for life.

Post traumatic growth

The existing literature defines post-traumatic growth as the constructive psychological shifts that can arise from grappling with profoundly challenging life events, such as a cancer diagnosis and subsequent treatment. (Zahra et al., 2024) Within the cancer context, accumulating evidence indicates that a considerable proportion of patients and their caregivers may undergo positive transformations, including enhanced appreciation for life, fortified interpersonal connections, and a heightened sense of personal resilience, as a consequence of navigating the cancer experience. A qualitative study (Loripoor et al., 2015) involving interviews with 19 women with breast cancer uncovered that facing their own mortality prompted a shift in their perspectives. This catalysed a greater appreciation for the present, heightened gratitude for day-to-day experiences, and a renewed sense of purpose. Similarly, in a study conducted by Longcoy et al., (2023) involving 41 breast cancer survivors, results have shown that the majority reported experiences of post-traumatic growth, including strengthened relationships, a heightened appreciation for life, and a bolstered sense of personal resilience.

Corroborating these findings, in their research which sets out to improve understanding of the cancer experience through interviews with young adult-aged cancer survivors, Steinberg et al., (2019) found that a substantial proportion of cancer patients, ranging from 60% to 95%, were found to experience post-traumatic growth. This manifested in positive changes across various domains, including their interpersonal relationships, and self-perception. The researchers explained that the shared adversity of the cancer experience can serve to strengthen bonds with family and friends. Many cancer patients and their caregivers reported feeling closer to their loved ones, experiencing increased empathy and support, and developing a deeper appreciation for the significance of personal relationships (Steinberg et al., 2019).Additionally, research indicates that cancer patients and their caregivers may

undergo constructive changes in their life philosophy, such as developing a greater acceptance of their vulnerabilities and limitations, as well as a heightened awareness and appreciation of their own mortality. This shift in perspective can lead to a renewed sense of purpose and a deeper understanding of what truly matters in life. (Sawyer et al., 2010)

While the research indicates promising findings regarding post-traumatic growth experienced by many individuals facing the adversity of a cancer diagnosis, it is important to recognise that this is not a universal outcome. Not all patients and their caregivers will undergo positive psychological transformations following such a challenging life event. This variation highlights the need to investigate the factors contributing to differences in post-traumatic growth outcomes. Social support appears to be a crucial element, but further research is required to elucidate its influence on stress levels and the potential for growth. This study aims to address this gap by adopting a quantitative approach to better comprehend the relationship between social support, stress, and growth among caregivers of cancer patients.

Hypothesis of the study

The current study hypothesizes that Perceived social support moderates the relationship between perceived stress and post-traumatic growth, such that the negative impact of stress on growth is weaker for caregivers with higher levels of social support.

2. Method

2.1 Participants and procedure

This study recruited 127 caregivers of adult cancer patients from the Oncology and Haematology Hospital of the Mohammed VI University Hospital Centre in Marrakech, Morocco. This study employed a purposive sampling technique to collect the data.

The eligibility criteria for inclusion in the study were: 1) being a primary caregiver for an adult cancer patient, 2) having provided care for at least 3 months, and 3) willingness to provide informed consent to participate. Caregivers of patients living with any other terminal disease or a psychiatric illness were excluded from the study.

The participants were informed of the study's aims and procedures, and they provided written consent before taking part. They then completed a sociodemographic report as well as self-report measures evaluating their perceived stress, perceived social support, and post-traumatic growth.

2.2 Measures

Perceived Stress Scale (PS): The study employed the Arabic version of the Perceived Stress Scale, which had been adapted and validated by Ben Loubir et al. (2014) for use with a Moroccan population. This adapted version of the PSS has demonstrated good psychometric properties in previous research involving Moroccan participants.
The 10-item Perceived Stress Scale was used to assess the degree to which situations in a caregiver's life were perceived as stressful. Participants rated each item on a 5-point Likert scale, ranging from 0 to 4, with higher scores indicating greater perceived stress.

The adaptation of the **Multidimensional Scale of Perceived Social Support (PSS)**, and **Posttraumatic Growth Inventory (PTG)** into Arabic for the Moroccan population followed a rigorous cross-cultural adaptation process to ensure linguistic and conceptual equivalence. The process included forward translation by bilingual experts, synthesis of translations, back translation, and expert review to resolve discrepancies and ensure cultural relevance. Pilot testing with a sample from the target population assessed clarity and appropriateness, leading to minor revisions. Psychometric validation confirmed the reliability and validity of the adapted scales, with Cronbach’s alpha values of 0.89 for the PSS, and 0.91 for the PTG, and

factor structures consistent with the original versions. The final adapted scales were deemed suitable for use in the Moroccan population and employed in the present study.

2.3 Data analysis

All statistical analyses were performed using SPSS software (version 21.0). Firstly, we calculated the means, standard deviations, and correlations between the study variables.

To test the hypothesis that perceived social support moderates the relationship between perceived stress and post-traumatic growth, a moderated mediation analysis was conducted using the PROCESS macro for SPSS.

2.4 Ethical Considerations

The study received authorization from the administration of the Hematology-Oncology Department at the Centre Hospitalier Universitaire Mohammed VI - Marrakech. All procedures complied with the ethical standards of the Declaration of Helsinki. all participants were provided with comprehensive information about the study's purpose, procedures, potential risks, and anticipated benefits. Written informed consent was obtained from each participant, ensuring their voluntary participation and the right to withdraw at any time without consequence. Confidentiality and anonymity were strictly maintained throughout the study, with all data being securely stored and used solely for research purposes. Participants were also assured that their responses would not be linked to their identities in any way. These measures were implemented to uphold the dignity, rights, and well-being of all participants.

3.Results

3.1 Descriptive Statistics

Summary statistics were calculated for each interval and ratio variable. Frequencies and percentages were calculated for each nominal variable.The most frequently observed category

of Gender was Female (n = 64, 50.39%). Frequencies and percentages are presented in Table 1. **(Table 1)**

The participants had a mean age of 47.81 years, ranging from 34 to 63 years. The CH (caregiving hours) variable had a mean score of 34.94, spanning from 22 to 50. The PSS (perceived social support) variable scored a mean of 27.37, with a range of 20 to 33. The PS (perceived stress) variable averaged 21.17, between 17 and 26. The PTG (post traumatic growth) variable had a mean of 13.16, with a range of 10 to 16. The summary statistics for these variables are presented in Table 2. **(Table 2)**

3.2 Pearson Correlation Analysis

A Pearson correlation analysis was conducted among PS, PTG, and PSS. Figure 1-Figure 2 presents the scatterplots of the correlations. A regression line has been added to assist the interpretation.**(Figure 1 – Figure 2)**

The analysis revealed a strong negative correlation between PS and PTG (r = -.65), as well as a significant negative correlation between PS and PSS (r = -.64). Conversely, PTG and PSS were positively correlated (r = .93). These findings suggest an inverse relationship, where higher PS is associated with lower PTG and PSS, while increased PTG corresponds with greater PSS. The results of these correlations are presented in Table 3. **(Table 3)**

3.3 Linear Regression Analysis

A linear regression analysis was conducted to assess whether PS and PSS significantly predictedPTG.The results of the linear regression model were significant, $F(2,124) = 417.06$, $p < .001$, $R^2 = .87$, indicating that approximately 87.06% of the variance in PTG is explainable by PS and PSS. PS significantly predicted PTG, $B = -0.07$, $t(124) = -2.08$, $p = .039$. This indicates that on average, a one-unit increase of PS will decrease the value of PTG by 0.07

192 units. PSS significantly predicted PTG, B = 0.50, t(124) = 20.69, p< .001. This indicates that
193 on average, a one-unit increase of PSS will increase the value of PTG by 0.50 units.

194 Table 4 summarizes the results of the regression model. **(Table 4)**

195 **Bootstrapping.** Bootstrapping was performed (N = 1,000) to assess which predictors
196 significantly predicted PTG. PS significantly predicted PTG, B_0 = -0.07, SE = 0.03, 95.00%
197 CI [-0.12, -0.010]. This indicates that on average, a one-unit increase of PS will decrease the
198 value of PTG by 0.07 units. PSS significantly predicted PTG, B_0 = 0.50, SE = 0.02, 95.00%
199 CI [0.46, 0.54]. This indicates that on average, a one-unit increase of PSS will increase the
200 value of PTG by 0.50 units. The results for Bootstrapping the regression coefficients are
201 presented in Table 5.**(Table 5)**

202 **3.4 Moderation**

203 A moderation analysis was conducted to test whether PSS moderated the relationship between
204 PS and PTG. The interaction term was not significant (B = -0.002, t(123) = -0.36, p = .722),
205 indicating that PSS did not moderate the relationship between PS and PTG. However, the
206 main effects of PS (B = -0.07, p = .037) and PSS (B = 0.50, p < .001) remained
207 significant.The results for Moderation Analysis with PTG Predicted by PS Moderated by PSS
208 are presented in table 6**(Table 6)**

209 **Moderation plot.** A moderation plot was generated by dichotomizing PSS into High and Low
210 categories using a median split. The High category indicates all observations of PSS above the
211 median, and the Low category specifies all observations of PSS below the median. The
212 moderation plot is presented in Figure 3**.(Figure 3)**

213 **4.Discussion**

The current study investigated the associations among social support, perceived stress, and post-traumatic growth in a sample of caregivers of cancer patients. The findings offer valuable insights into the protective role of social support in mitigating the negative impacts of caregiving stress and promoting positive psychological outcomes in this vulnerable population. These results align with existing literature, which highlights the crucial function of social support in buffering the detrimental effects of caregiving stress and fostering resilience and growth (Kira et al., 2012) (Schubert et al., 2015).

The descriptive statistics revealed that the majority of the caregiver participants were female, which is consistent with previous research indicating that women are more likely to assume caregiving responsibilities (Pinquart & Sörensen, 2006). The average age of caregivers in this study was 47.81 years, suggesting that many were in midlife, a period often characterized by multiple roles demands, including work, family, and caregiving obligations. The mean scores for perceived stress and post-traumatic growth indicated moderate levels of both stress and growth among the caregivers, underscoring the dual nature of the caregiving experience, which can be both challenging and transformative.

The Pearson correlation analysis revealed significant associations among perceived social support, perceived stress, and post-traumatic growth. Specifically, higher levels of perceived social support were linked to lower levels of perceived stress and higher levels of post-traumatic growth. These findings align with the stress-buffering hypothesis, which posits that social support can mitigate the negative effects of stress by providing emotional and instrumental resources (Kim et al., 2006). The strong positive correlation between post-traumatic growth and perceived social support suggests that caregivers experiencing higher levels of stress may also be more likely to report growth, possibly due to the transformative nature of coping with significant challenges.

The linear regression analysis further corroborated these findings, indicating that both perceived social support and perceived stress were significant predictors of post-traumatic growth. Specifically, higher levels of perceived social support were associated with lower levels of stress and greater post-traumatic growth. This is consistent with previous research suggesting that social support can enhance caregivers' ability to cope with stress and find meaning in their caregiving experiences (Kim et al., 2013). The regression model explained a substantial proportion of the variance in post-traumatic growth, underscoring the importance of social support and stress in shaping caregivers' psychological outcomes.

The moderation analysis did not detect a significant interaction effect between perceived social support and perceived stress on post-traumatic growth. This implies that while both social support and stress independently influence post-traumatic growth, their combined influence does not significantly moderate the relationship. This finding may suggest that the protective effects of social support function independently of stress levels, or that other factors, such as coping strategies or personality characteristics, may play a more pivotal role in moderating this relationship.

Nonetheless, the main effects observed in the moderation analysis highlight the crucial importance of both social support and stress management in promoting post-traumatic growth among cancer caregivers.

Implications for Practice

The findings of this research have notable implications for supporting caregivers of cancer patients in Morocco, where cultural and social dynamics often shape caregiving experiences. The strong association between social support and reduced stress underscores the need for interventions that enhance caregivers' access to emotional and instrumental support within the Moroccan context. Given the collectivist nature of Moroccan society, family and community

networks can play a pivotal role in providing this support. Interventions such as community-based support groups, counselling services tailored to cultural norms, and respite care programmes could be particularly effective in alleviating caregiver stress. Furthermore, healthcare providers in Morocco should recognise the dual role of caregivers as both providers and recipients of care. Integrating caregiver support into cancer care plans, providing education on stress management, and connecting caregivers with local resources could significantly improve their wellbeing. Programmes that foster post-traumatic growth, such as meaning-centred therapy or mindfulness-based interventions adapted to Moroccan cultural values, could help caregivers find positive meaning in their experiences. These interventions should be designed with sensitivity to the cultural, religious, and social contexts of Moroccan caregivers to ensure their relevance and effectiveness.

Limitations and Future Directions

This study offers valuable insights into the role of social support in mitigating stress and promoting growth among Moroccan caregivers, but several limitations warrant consideration. The cross-sectional design restricts the ability to draw causal inferences about the relationships between social support, stress, and post-traumatic growth. Future research should employ longitudinal approaches to explore the dynamic interactions of these variables over time and identifypotential causal pathways.

Furthermore, the reliance on self-report measures may be subject to response biases, such as social desirability or recall bias. Incorporating mixed-method approaches, including interviews or observational measures, could provide a more comprehensive understanding of caregivers' experiences.Additionally, the predominantly female sample reflects the gendered nature of caregiving roles in Morocco, but this may limit the generalisability of the findings to male caregivers. Future studies should aim to include a more gender-balanced sample to

investigate potential differences in the experience of stress and growth among male and female caregivers.

Despite these limitations, this study contributes to the growing body of literature on the psychological well-being of cancer caregivers in non-Western contexts.

5. Conclusion

This study emphasises the pivotal function of social support in alleviating stress and fostering post-traumatic growth among caregivers of cancer patients in Morocco. The findings underscore the necessity of developing culturally sensitive interventions that amplify caregivers' access to social support and address their psychological needs. By cultivating supportive environments and equipping caregivers with the resources to manage stress, healthcare providers and policymakers in Morocco can help promote positive psychological outcomes and enhance the overall well-being of caregivers. Future research should continue to investigate the intricate interplay between social support, stress, and growth in this population, with a focus on longitudinal designs, mixed-method approaches, and diverse cultural contexts. By doing so, researchers and practitioners can develop more effective, culturally relevant interventions to support caregivers in their vital role, ultimately contributing to better outcomes for both caregivers and cancer patients in Morocco and beyond.

Declarations

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding: No funding was received for this work.

References

1. Belbaraka, R., Benhima, N., Laatabi, A., Fadli, M. E., & Essâdi, I. (2022). Incidence Trends of Cancer in Morocco: The Tale of the Oncological Center of Marrakech (Morocco) over 8 Years. In Journal of Cancer Epidemiology (Vol. 2022, p. 1). Hindawi Publishing Corporation. https://doi.org/10.1155/2022/3307194

2. Bray, F., Laversanne, M., Sung, H., Ferlay, J., Siegel, R. L., Soerjomataram, I., & Jemal, A. (2024). Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. In CA A Cancer Journal for Clinicians (Vol. 74, Issue 3, p. 229). Wiley. https://doi.org/10.3322/caac.21834

3. Caregivers of Cancer Patients. (2014). https://www.cancer.gov/about-cancer/coping/caregiver-support

4. Chong, A. S. S., Ahmad, M., Harizan, N. B. M., Alias, H., Hussain, R. I., Lateh, A., & Chan, C. M. H. (2023). Predictors of Post-traumatic Stress Symptoms (PTSS), Depression, and Anxiety among Caregivers of Children with Acute Lymphoblastic Leukaemia (ALL). In Asian Pacific Journal of Cancer Prevention (Vol. 24, Issue 6, p. 1923). West Asia Organization for Cancer Prevention. https://doi.org/10.31557/apjcp.2023.24.6.1923

5. Fekih-Romdhane, F., Fawaz, M., Hallit, R., Sawma, T., Obeïd, S., & Hallit, S. (2023). Psychometric properties of an Arabic translation of the multidimensional social support scale (MSPSS) in a community sample of adults. In BMC Psychiatry (Vol. 23, Issue 1). BioMed Central. https://doi.org/10.1186/s12888-023-04937-z

6. Forbes, H., Carreira, H., Funston, G., Andresen, K., Bhatia, U., Strongman, H., Abrol, E., Bowen, L., Giles, C., & Bhaskaran, K. (2024). Early,mediumandlong-term mental healthincancersurvivors compared with cancer-free comparators: matched cohort study using linked UK electronic health records.

7. Goldzweig, G., Schapira, L., Baider, L., Jacobs, J. M., Andritsch, E., & Rottenberg, Y. (2019). Who will care for the caregiver? Distress and depression among spousal caregivers of older patients undergoing treatment for cancer. In Supportive Care in Cancer (Vol. 27, Issue 11, p. 4221). Springer Science+Business Media. https://doi.org/10.1007/s00520-019-04711-6

8. Kim, H. S., Sherman, D. K., Ko, D., & Taylor, S. E. (2006). Pursuit of Comfort and Pursuit of Harmony: Culture, Relationships, and Social Support Seeking. In Personality and Social Psychology Bulletin (Vol. 32, Issue 12, p. 1595). SAGE Publishing. https://doi.org/10.1177/0146167206291991

9. Kim, Y., Carver, C. S., Schulz, R., Lucette, A., & Cannady, R. (2013). Finding Benefit in Bereavement among Family Cancer Caregivers. In Journal of Palliative Medicine (Vol. 16, Issue 9, p. 1040). Mary Ann Liebert, Inc. https://doi.org/10.1089/jpm.2013.0049

10. Kira, I. A., Abou-Mediene, S., Ashby, J. S., Odenat, L., Mohanesh, J., & Alamia, H. (2012). The Dynamics of Posttraumatic Growth Across Different Trauma Types in a Palestinian Sample. In Journal of Loss and Trauma (Vol. 18, Issue 2, p. 120). Taylor & Francis. https://doi.org/10.1080/15325024.2012.679129

11. Krok, D., Telka, E., Falewicz, A., & Szczęśniak, M. (2024). Total Pain and Fear of Recurrence in Post-treatment Cancer Patients: Serial Mediation of Psychological Flexibility and Mentalization and Gender Moderation. https://doi.org/10.20944/preprints202403.0901.v1

12. Longcoy, L.-T. H., Wu, W., Wei, C.-J., & Doorenbos, A. Z. (2023). Examining the Role of Resilience, Posttraumatic Growth, and Quality of Life in Women with Breast Cancer: A Serial Multiple Mediator Model Approach. In Seminars in Oncology

Nursing (Vol. 39, Issue 4, p. 151441). Elsevier BV. https://doi.org/10.1016/j.soncn.2023.151441

13. Loripoor, M., Bahrami, M., Taleghani, F., & Yousefy, A. (2015). Positive changes after breast cancer: A qualitative study. In Journal of Education and Health Promotion (Vol. 4, Issue 1, p. 55). Medknow. https://doi.org/10.4103/2277-9531.162353

14. Loubir, D. B., Serhier, Z., Battas, O., Agoub, M., & Othmani, M. B. (2014). Evaluation of Psychometric Properties of the Arabic Version of PSS Stress Measuring Scale in the Moroccan Population. In SAGE Open (Vol. 4, Issue 4). SAGE Publishing. https://doi.org/10.1177/2158244014564353

15. Medicine, I. of. (2008). Cancer Care for the Whole Patient. In National Academies Press eBooks. https://doi.org/10.17226/11993

16. Northouse, L., Katapodi, M. C., Schafenacker, A., & Weiss, D. (2012). The Impact of Caregiving on the Psychological Well-Being of Family Caregivers and Cancer Patients [Review of The Impact of Caregiving on the Psychological Well-Being of Family Caregivers and Cancer Patients]. Seminars in Oncology Nursing, 28(4), 236. Elsevier BV. https://doi.org/10.1016/j.soncn.2012.09.006

17. Obtel, M., Lyoussi, B., Tachfouti, N., Pelissier, S. M., & Nejjari, C. (2015). Using surveillance data to understand cancer trends: an overview in Morocco. In Archives of Public Health (Vol. 73, Issue 1). BioMed Central. https://doi.org/10.1186/s13690-015-0094-8

18. Pinquart, M., & Sörensen, S. (2006). Gender Differences in Caregiver Stressors, Social Resources, and Health: An Updated Meta-Analysis [Review of Gender Differences in Caregiver Stressors, Social Resources, and Health: An Updated Meta-

Analysis]. The Journals of Gerontology Series B, 61(1). Oxford University Press. https://doi.org/10.1093/geronb/61.1.p33

19. Sawyer, A., Ayers, S., & Field, A. P. (2010). Posttraumatic growth and adjustment among individuals with cancer or HIV/AIDS: A meta-analysis [Review of Posttraumatic growth and adjustment among individuals with cancer or HIV/AIDS: A meta-analysis]. Clinical Psychology Review, 30(4), 436. Elsevier BV. https://doi.org/10.1016/j.cpr.2010.02.004

20. Schubert, C. F., Schmidt, U., & Rosner, R. (2015). Posttraumatic Growth in Populations with Posttraumatic Stress Disorder—A Systematic Review on Growth-Related Psychological Constructs and Biological Variables [Review of Posttraumatic Growth in Populations with Posttraumatic Stress Disorder—A Systematic Review on Growth-Related Psychological Constructs and Biological Variables]. Clinical Psychology & Psychotherapy, 23(6), 469. Wiley. https://doi.org/10.1002/cpp.1985

21. Steinberg, D. M., Santiago, R. A., Tanenbaum, M. L., Cline, G. D., & Schneider, N. M. (2019). "It Made Me the Person I Am Today…": Survivors of Childhood, Adolescent, and Young Adult Cancer Reflect on Their Experiences. In Journal of Adolescent and Young Adult Oncology (Vol. 9, Issue 2, p. 239). Mary Ann Liebert, Inc. https://doi.org/10.1089/jayao.2019.0122

22. Zahra, K., Khan, S., Sadia, R., & Aslam, I. (2024). Resilience and Post-traumatic Growth among Cancer Patients: A Moderated Mediation Analysis through Perceived Social Support and Stress. In Psychology in Russia State of Art (Vol. 17, Issue 2, p. 34). Moscow State University. https://doi.org/10.11621/pir.2024.0203

Table 1: *Frequency Table for Nominal Variables*

Variable	*n*	*%*
Gender		
Female	64	50.39
Male	63	49.61
Missing	0	0.00

Table 2: *Summary Statistics Table for Interval and Ratio Variables*

Variable	*M*	*SD*	*n*	SE_M	Min	Max	Skewness	Kurtosis
Age	47.81	6.22	127	0.55	34.00	63.00	0.21	-0.34
CH	34.94	7.75	127	0.69	22.00	50.00	0.08	-0.99
PSS	27.37	3.64	127	0.32	20.00	33.00	-0.15	-1.04
PS	21.17	2.73	127	0.24	17.00	26.00	0.28	-1.09
PTG	13.16	2.08	127	0.18	10.00	16.00	-0.16	-1.29

Table 3 : *Pearson Correlation Matrix Among PS, PTG, and PSS*

Variable	1	2	3

1. PS	-		
2. PTG	-.65*	-	
3. PSS	-.64*	.93*	-

Note. * $p < .05$.

Table 4 : *Results for Linear Regression with PS and PSS predicting PTG*

Variable	*B*	*SE*	95.00% CI	β	*t*	*p*
(Intercept)	0.91	1.22	[-1.50, 3.32]	0.00	0.75	.456
PS	-0.07	0.03	[-0.13, -0.003]	-0.09	-2.08	.039
PSS	0.50	0.02	[0.45, 0.55]	0.87	20.69	< .001

410

411 **Table 5** : *Results for Bootstrapping the Regression Coefficients.*

Variable	B_0	*SE*	95.00% CI
(Intercept)	0.91	0.91	[-0.73, 2.90]
PS	-0.07	0.03	[-0.12, -0.010]
PSS	0.50	0.02	[0.46, 0.54]

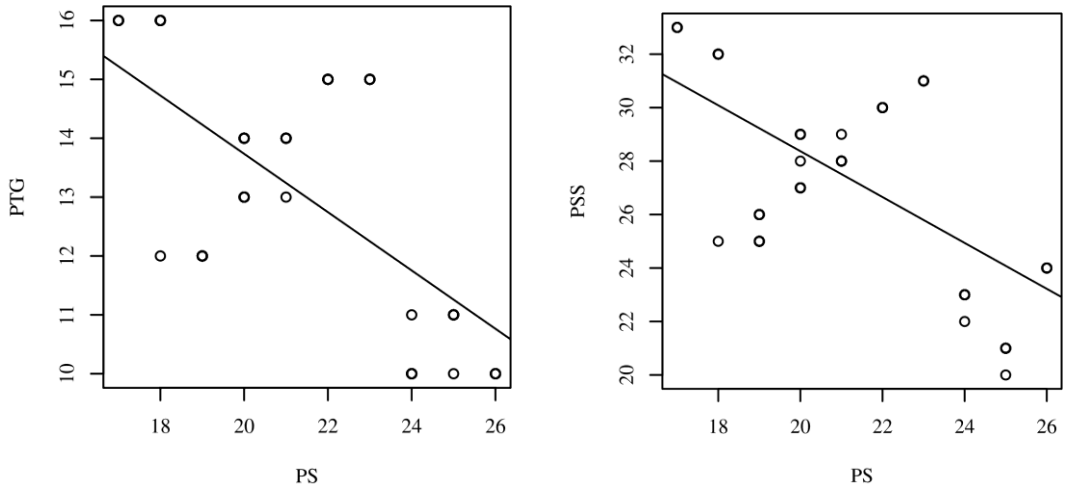
412

413 **Table 6** : *Moderation Analysis Table with PTG Predicted by PS Moderated by PSS*

Predictor	*B*	*SE*	β	*t*	*p*

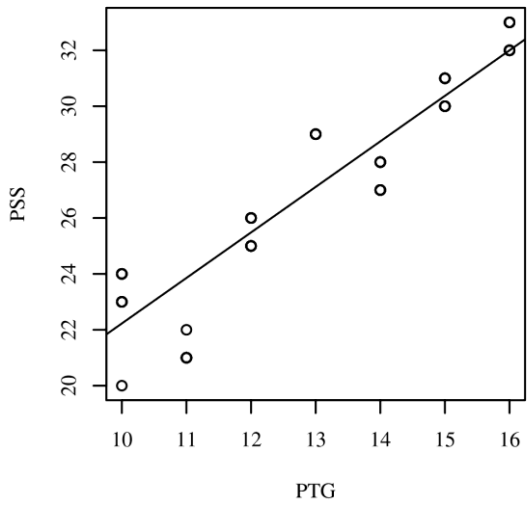
(Intercept)	13.14	0.08	0.00	167.59	< .001
PS	-0.07	0.03	-0.09	-2.10	.037
PSS	0.50	0.02	0.88	20.58	< .001
PS:PSS	-0.002	0.006	-0.01	-0.36	.722

414 **Figure 1 :** *Scatterplots with the regression line added for PS and PTG (left), PS and PSS*
415 *(right)*



416

417 **Figure 2** : *Scatteplots with the regression line added for PTG and PSS*



418

Figure 3 : *Regression lines for PTG predicted by PS for the High and Low categories of PSS*