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Data-Informed Insights on Thriving Through Challenges: Exploring Posttraumatic Growth, Resilience, and Social Support in Hemodialysis Patients

Nudra Malik, Saira Razzaq, Aqsa Shabbir, Naveed Iqbal, Amina Muazzam*

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Nudra Malik, Saira Razzaq & Amina Muazzam are currently affiliated with the Department of Applied Psychology, Lahore College for Women University, Lahore, Pakistan.
Email: nudra.malik@lcwu.edu.pk
Email: sairarazzaq859@gmail.com
Email:amina.muazzam@lcwu.edu.pk

Aqsa Shabbir is currently affiliated with the Department of Electrical Engineering, Lahore College for Women University, Lahore, Pakistan.
Email: aqsa.shabbir@lcwu.edu.pk

Naveed Iqbal is currently affiliated with the Department of Mass Communication, Lahore College for Women University, Lahore, Pakistan.
Email: naveed.iqbal@lcwu.edu.pk

Corresponding Author*

Abstract

Hemodialysis is one treatment option for end stage renal disease which does not cure the disease completely but increases the patients' span of life. It imposes a lot of physical and psychological burden on the patients. Identification of factors protecting the patients from these burdens is needed. Recent studies have focused on posttraumatic growth (PTG) as a protective factor against the distressing health outcomes. The aim of this cross-sectional study is to investigate the occurrence of PTG in patients on maintenance hemodialysis and examine its association with perceived social support and resilience. A convenience sample of 200 patients receiving maintenance hemodialysis was recruited from two government hospitals of Lahore, Pakistan. Data was collected using Posttraumatic Growth Inventory, Perceived Social Support Scale, and Trait Resilience Scale. Individuals undergoing hemodialysis showed high levels of PTG and the mean total score for PTGI was 60.1± 11.5. Resilience ($r = .79$, $p<.001$) and perceived social support ($r = .51$, $p<.001$) were significantly correlated with PTG. Hierarchical multiple regression indicated increasing age, longer duration of hemodialysis, and resilience to be significant predictors ($p<.001$) of PTG in patients and explained 52% of the variance. The results provide helpful information which could be used to develop interventions for patients to transform their adversity into positive growth by improving their resilience and social support.

Keywords: posttraumatic growth, resilience, social support. end-stage renal disease, hemodialysis patients.

INTRODUCTION

Hemodialysis stands as the predominant treatment method for individuals suffering from end-stage renal disease (ESRD). It is one treatment option that increases a patient's longevity and, at the same time, imposes several limitations on them, leading to numerous physical, mental, social, and financial complications (Shahgholian & Yousefi, 2018). It causes fatigue, nausea, sleep issues, low appetite, limitations in physical activities, cognitive deterioration and psychological consequences including depression. All these side effects of hemodialysis (HD) treatment, follow-up visits to the healthcare centers, and the related uncertainty about future health immensely stress the patients, disrupting their mental harmony. This is why the lengthy hemodialysis therapy is frequently viewed by the patients as a crisis having adverse consequences for their

wellbeing. However, it sometimes serves as a harbinger of positive change (Reckert et al., 2013). Many patients do not feel defeated by their condition. They exhibit strength-based attributes that play a protective role against devastating health outcomes. Some of these preserving attributes are PTG, gratitude, resilience, and hope, among many others. PTG refers to the positive psychological change individuals experience after struggling with challenging life situations or traumatic events (Tedeschi & Calhoun, 2004). It is related to enhanced quality of life and happiness and is negatively associated with anxiety and depressive symptoms (Willie et al., 2016). Research has underscored the substantial importance of posttraumatic growth (PTG) in yielding positive outcomes for individuals navigating traumatic experiences. (Li et al., 2018). PTG helps individuals gain a better appreciation of life, a new sense of personal strength, a further understanding of the world and themselves, better relationships with others, greater recognition of new paths and possibilities for life, and a deeper sense of spirituality (Tedeschi & Calhoun, 1996) and change behavior for better health (Lelorain et al., 2010). Researchers have focused on PTG for decades to bring about an improvement in individuals and groups dealing with traumatic events.

The existence of PTG in cancer survivors is well known; however, less is known about why some cancer survivors experience more positive changes than others do. It is believed that resilience is the main factor that accounts for the different perceptions found in patients about their PTG. Resilience is a personality trait with an essential role in development. It is viewed as an individual's ability to adapt well to stress, trauma, or adversity and maintain physical and mental wellbeing under such conditions (Li et al., 2018). Low resilience has been associated with increased odds of psychological distress in patients with cancer (Min et al., 2013) and also higher risks of sleep problems, anxiety, and depression (Lai et al., 2020).

Positive reappraisal, a concept similar to PTG, has been studied as the most used coping strategy in hemodialysis patients (Ahmad & Al Nazly, 2015); however, PTG has yet to be explored much in this patient population. Studies conducted on heart, kidney, liver, and lung transplant patients have discovered PTG to be beneficial for them in dealing with physiological and psychological stress (Credle, 2020; Kamran & Ogden, 2016). Li et al. (2018) reported a moderate level of PTG in hemodialysis patients and found resilience and rumination to be critical protective factors for enhancing PTG. Another study on patients undergoing hemodialysis treatment indicated a significant role of resilience in attaining PTG. It recommended the implementation of psychological interventions at dialysis centers to promote patient resilience (Kiani et al., 2019).

PTG is experienced by individuals coping with chronic diseases and is associated with better health and psychological outcomes. Empirical evidence has reported that coping strategies like PTG, resilience, and gratitude benefit individuals with chronic diseases (Credle, 2020). Both physical and psychological trauma are higher in patients who receive hemodialysis as compared to the ones with chronic kidney disease only. This could be attributed to the fact that patients undergoing hemodialysis experience a plethora of physical side effects in addition to psychosocial challenges. Hypotension, muscle cramps, anemia, nausea, vomiting, pruritus, joint pain, lower torso weakness, dry mouth, fatigue, and difficulty falling asleep are some of the physical symptoms that are usually caused by factors like uremic toxin accumulation, increased catabolism, comorbidities, and aging (Liu et al., 2018; Saboor & Malik, 2024). The symptoms are also

associated with higher severity of anxiety, depression, and deteriorated quality of life. Besides these side effects, patients also encounter challenges like physical degeneration, a struggle to carry out everyday tasks, self-care, diet restrictions, and physical and social role changes. With more research on hemodialysis patients, the beneficial role of appropriate social support has now been acknowledged in this regard. Social support usually provided by family, friends, colleagues, health care providers, and community members is associated with better disease management (Theodoritsi et al., 2016; Ziadi et al., 2023). It is seen to not only reduce the distress but also improve psychological wellbeing, adherence to treatment plans, and coping with the illness and the traumatic hemodialysis experience. (Alshraifeen et al., 2020). Social support is one of the effective ways to enhance the treatment success, adjustment of the patient to the illness, and disease management (Theodoritsi et al., 2016). Research has indicated that social support influences PTG development in patients with chronic diseases and hemodialysis (Cui et al., 2017; Hasson-Ohayon et al., 2016). It improves the quality of life of hemodialysis patients by providing them with psychological comfort and contributing to physical and mental growth, thereby promoting their PTG. It is recommended that medical staff appraise patients' social support and assist them in actively seeking support resources to increase their level of PTG (Cui et al., 2017).

Previous literature has reported PTG in numerous medical conditions, specifically cancer (Greup et al., 2018; Peng et al., 2019), cardiac diseases (Magid et al., 2019; Sheikh et al., 2004), inflammatory bowel disease (Hamama-Raz et al., 2021) and kidney disease patients. However, much of the work in kidney diseases has been done on renal transplant patients (Sheerazi & Kamran, 2020; Tomaszek et al., 2021; Yorulmaz et al., 2010), and only a few studies have been conducted on hemodialysis patients (Kiani et al., 2019; Li et al., 2018; Sadeghpour & Heidarzadeh, 2019). A study by Li et al. (2018) observed resilience to be a significant contributing factor in the development of PTG in HD patients. The study indicated higher levels of resilience to be associated with greater PTG suggesting that patients who are more resilient cope better with stressful life circumstances and also are more adaptable to the current life challenges.

The connection between posttraumatic growth (PTG), resilience, and social support remains relatively unexplored in the context of hemodialysis patients. Therefore, to fill the void in the existing literature regarding this matter, the present study seeks to investigate the correlation between posttraumatic growth (PTG), resilience, and social support among HD patients, taking into account sociodemographic and clinical factors. This research focuses on a neglected demographic in Pakistan—individuals grappling with life-threatening disabilities. The following hypotheses were formulated. As PTG is considered an outcome rather than a process (Tedeschi & Calhoun, 1996), it was hypothesized that there would be significant relationship among PTG, social support and resilience. Another hypothesis was that perceived social support and resilience would be significant predictors of PTG in HD patients.

METHODOLOGY

A cross-sectional study was conducted from November 2021 to March 2022. We selected a convenient sample of 200 participants receiving maintenance hemodialysis from dialysis centers of two government hospitals in Lahore, Pakistan. They were provided the participant information sheet, and informed consent was obtained from all. For the

inclusion in the study, following criteria was observed: Patients who were over 18 years of age; getting maintenance hemodialysis for at least three months; the frequency of hemodialysis was twice or thrice per week; they could read, understand, and answer the questionnaire items. The participants who had a diagnosis of any psychological disorder, any unstable physical condition other than kidney disease, and had a diagnosis of any cognitive impairment which could hinder accurate responses to the questionnaires were excluded. The research obtained approval from the Institutional Review Board of Lahore College for Women University, Lahore. Permission was also obtained from the hospital administration, where data was collected. The eligible patients were identified and approached. They were briefed about the study objectives, voluntary participation, confidentiality of the data, as well as their right to withdraw from the study whenever they wish to. Written informed consent was taken from the ones who agreed to participate. Questionnaires were provided, and they were only assisted in filling them out if it was not convenient for them to write due to needles in their writing hand. On average, 15-25 minutes were required by the patients to complete one set of questionnaires. Data was collected from 214 participants, but 14 forms (6.5%) were excluded due to incomplete responses and the remaining were used for analysis.

Demographic Form

Demographic form asking for information about the participants' gender, age, marital status, occupation, duration of dialysis, age of dialysis, and comorbidities was administered.

Trait Resilience Scale

The Trait Resilience Scale (TRC) is comprised of 18 items that measure resilience traits in individuals since childhood rather than just at present. The participants rate themselves on 5-point Likert response items (from 'strongly disagree'=1 to 'strongly agree'=5). The scale has shown high internal consistency reliability, with Cronbach's alpha being .81 (Hiew et al., 2000).

Multidimensional Scale of Perceived Social Support

MSPSS is a brief 12-item measure developed by Zimet et al. (1988) to assess the perceived level of social support from family, friends, and significant other. It uses a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree) and a high score reflects a high degree of support. A validated Urdu scale version was used for the current study, and Cronbach's a was .83 for the hemodialysis sample.

Posttraumatic Growth Inventory (PTGI)

The participants' perceived positive changes following a crisis were assessed using the Posttraumatic Growth Inventory (PTGI). The inventory comprises 21 items categorized into five dimensions, namely personal strength, appreciation of life, new possibilities, relating to others, and spiritual change (Tedeschi & Calhoun,1996).
All responses on the scale range from 0 (indicating no change experienced) to 5 (indicating experiencing this change to a great degree), with higher scores reflecting greater levels of posttraumatic growth. The Cronbach's a values for both the total scale and the five subscales ranged from .67 to .86.

RESULTS

Data analysis was performed using the SPSS 25 software. In the first step, descriptive statistics were calculated, and a t-test and ANOVA were conducted to examine the differences in PTG concerning participants' characteristics. In the second step, bivariate correlation was conducted for possible associations among variables. In the last step, hierarchical multiple regression was performed to identify factors that significantly influenced PTG in patients.

Table 1.
Sociodemographic characteristics of the Participants *(N=200)*

Variables	***Categories***	**Frequency (%)**	**M (SD)**	***P***
		PTG		
Gender	Male	93 (46.5)		.214
	Female	107 (53.5)		
Age	< 35	11 (5.5)	53.88 (14.1)	.001
	36-50	45 (22.5)		
	51-65	104 (52)		
	>65	40 (20)		
Marital status	Married	183 (91.5)		.035
	Unmarried	17 (8.5)		
Education	Middle school or under	45 (22.5)		.113
	Intermediate	60 (30)		
	Graduation	69 (34.5)		
	Post-graduation	26 (13)		
Occupation	Employed	116 (58)		.101
	Unemployed	84 (42)		
Duration of Dialysis	3 months to 1 year	50 (25)	34.42 (22.78)	.000
	1-3 years	72 (36)		
	> 3 years	78 (39)		
Comorbidities	Cardiovascular disease	61 (24.4)		.001
	Diabetes	69 (27.6)		
	Hypertension	120 (48)		
	Respiratory disease	43 (17.2)		
	Osteoporosis/Arthritis	58 (23.2)		
	Others	17 (6.8)		
Number of comorbid conditions			2.55±1.17	

The descriptive statistics of the participants are given in Table 1. Most participants were women (53.5%) aged 29 to 76 (M=44.88). Most participants were married (91.5%) and employed (58%). The maximum number of patients had been having their dialysis for more than three years (39%), whereas 25% had started it within the last one-year time frame. 48% of the participants had comorbid hypertension, followed by diabetes (27.6%) and cardiovascular diseases (24.4%). A few participants (6.8%) reported other comorbid conditions like anemia, peptic ulcer disease, hyperlipidemia, etc. In addition, significant differences were observed in PTG regarding age, marital status, duration of diabetes, and comorbidities.

Table 2.

Variables	M (SD)	1	2	3	4	5	6	7
1.PTG	60.07 (11.5)	-	-	-	-	-	-	-
2.Resilience	68.27 (9.55)	.79***	-	-	-	-	-	-
3.Social Support	56.78 (13.7)	.51***	.63***	-	-	-	-	-
4.Age	53.88 (14.1)	-.58***	-.41***	-.34***	-	-	-	-
5.Gender	1.66 (1.31)	.11*	.04	.19***	-.03	-	-	-
6. Duration of Dialysis	34.42 (22.8)	.22***	-.17**	-.22***	-.26**	-.01	-	-
7. Comorbidity	2.55 (1.17)	-.34***	-.25**	-.30***	.38**	-.02	.27***	-

Intercorrelations among study variables (N=200) resilience (r = 0.79, p < .001), moderate correlation with social support (r = 0.51, p = < .001), and inverse correlation with age, duration of dialysis, and number of comorbidities. Being a woman was associated with better PTG and more social support. There were low to moderate inverse associations among resilience, social support, age, dialysis duration, and comorbidities.

Hierarchical multiple regression analysis was performed to identify the significant predictors of PTG. The variables were added in three models, out of which models 2 and 3 were significant in the regression ANOVA analysis. Gender, age, marital status, duration of dialysis, and comorbidities were entered in the first model, accounting for 12% of the variance. Perceived social support was added in model two, which explained an additional 11% of the variance, with greater social support being associated with higher levels of PTG (ß = -0.435, p < 0.001).

Also, age (ß = -0.434, p < 0.001) and marital status (ß = -0.135, p < 0.001) were inversely associated with PTG, indicating greater PTG in younger and married patients as compared to older and single ones. Longer duration of dialysis was also associated with higher PTG (ß = 0.371, p < 0.001). Resilience was added in the last step in model three, and it was found to be the most robust with adjusted R^2 = 0.52; F (7, 249) = 16.91, p < 0.001.

Table 3.

Hierarchical regression analysis on Posttraumatic growth (N = 200)

Predictors	B	SE	β	t	R	Adjusted R^2 (ΔR^2)	F
Model 1					*.209*	*.12*	*1.259*
Gender	-.200	.415	-.034	-.481			
Age	-1.512	.068	-.710***	-22.139			
Marital status	-9.390	.844	-.275***	-11.126			
Duration of Dialysis	.11	.03	.212*	3.412			
Comorbidity	-.041	-.044	-.030	-.930			
Model 2					.407	.23 (.11)	4.735***
Gender	-.105	.390	-.018	-.269			
Age	-.897	.061	-.434***	-14.687			
Marital status	-4.621	.649	-.135***	-7.119			
Duration of Dialysis	.14	.081	.371***	3.717			
Comorbidity	-.036	-.030	-.026	-1.227			
Social support	.564	.037	.435***	15.309			
Model 3					.567	.52 (.29)	16.908***
Gender	.177	.32	.030	.552			
Age	-.481	.048	-.232***	-10.018			
Marital status	-.519	.499	-.015	-1.039			
Duration of Dialysis	.262	.377	.418***	6.958			
Comorbidity	.003	.020	.002	.015			
Social support	.178	.047	.160	1.664			
Resilience	.944	.059	.772***	15.920			

*p < .05; **p < .01; ***p < .001

Adding resilience to the prediction model resulted in 29% of the variance, and the overall model explained 52% of the variance in PTG. Age (ß = -0.232, *p* = 0.001), duration of dialysis (ß = 0.418, *p* = 0.001), and resilience (ß = 0.772, *p* = 0.001) came out to be significant predictors of PTG. Upon inclusion of resilience in model three, the association between social support and posttraumatic growth (PTG) became nonsignificant (p > .05).

DISCUSSION

The patients exhibited a moderate level of posttraumatic growth (PTG), a finding consistent with studies involving hemodialysis (HD) patients in China and Turkey (Li et al., 2018; Yorulmaz et al., 2010). The observed similarities may be attributed to various factors,

including the severity levels of the disease and similarities in Asian family structures. The study indicated that being female, married, having a younger age, higher education level, less number of comorbid conditions, longer duration of dialysis, better social support, and being more resilient were associated with better PTG in patients. These findings are partly consistent with previous literature (Li et al., 2018; Yucetin et al., 2015). Previous studies have shown PTG to be slightly more in women as compared to men, which could be attributed to the fact that women usually undergo higher levels of anxiety, fear, panic, and ruminating thoughts. When the trauma response is intense, it increases the chances of developing PTG eventually (Eke et al., 2019). Young and married patients undergoing hemodialysis had increased PTG compared to older and single individuals. One explanation for this could be that younger patients are more flexible and knowledgeable in changing their perspectives when facing adversity (Lopez et al., 2015; Sheerazi & Kamran, 2020).

The findings related to marital status are similar to what earlier literature has found that having a partner is positively associated with PTG. Individuals undergoing a traumatic experience like an end-stage disease or painful treatment may get support from a committed partner to help them cope with that experience positively (Cui et al., 2017; Mystakidou et al., 2008). Longer dialysis duration was also strongly associated with higher PTG than the ones with shorter duration. Research studies have shown that individuals with short duration of dialysis are still trying to manage the emotional distress, and hence, PTG is not yet achieved (Li et al., 2018). Social support was another variable that was positively associated ($p<.001$) with PTG in hemodialysis patients. Individuals who perceived their social support system as strong had greater PTG than others who perceived it as weak. One of the reasons for this finding is that social support is a coping strategy that helps individuals to overcome traumatic situations.

Lack of social support is seen to be a predictive factor of mortality and hospital readmissions in cancer patients (Lotfi et al., 2013), whereas adequate social support is a contributing factor for physical and mental growth in hemodialysis patients (Cui, 2017). Also, it is important to mention that Pakistan has a culture that thrives on close bonds, and family and relatives often assist with daily activities and responsibilities that the patient could not perform due to illness or treatment complications.The present study showed resilience as the highly correlated variable with PTG. Results also indicated resilience as the strongest contributory factor ($p<.001$), adding to higher PTG in patients. These results are consistent with previous findings (Li et al., 2018; Manning et al., 2016). A study by Manning et al. (2016) in the US on a sample of about 10,750 Americans revealed that resilience considerably lessened the harmful consequences linked with the onset of chronic disease and subsequent disability. Many factors, like social support, cultural aspects, and the individual's personality, play a role in it. However, more than anything, resilience itself is a protective factor that supports maintaining balance in one's life during hard times and facing adversities without developing mental health issues. Resilient individuals have more flexibility and greater adaptability to cope vigorously with difficult situations. A recent study on renal transplant patients in Pakistan supported these findings. It revealed that the more resilient individuals manifested better PTG and exhibited greater spiritual change, personal strength, and appreciation of life (Sheerazi & Kamran, 2020). PTG is reported more in individuals who have been through and experienced life-threatening or chronic illnesses, sexual abuse/assault, sudden loss of a loved one, and

refugee experiences. In the time of suffering and substantial psychological struggles, it could also coexist with distress. Whatever the circumstances, the development of PTG involves powerful and experiential changes that encourage the survivors to spend time altering their understanding of the world and self. There were a few limitations of this study as well. Firstly, the sample size was relatively small and was taken from two government hospitals. Secondly, it was a cross-sectional study, and the data was collected through survey questionnaires. Hence, causal relationships could not be established. Future research could focus more on recruiting participants from multiple centers with a large sample size. Moreover, longitudinal or randomized control trials could be adopted to establish causal relationships. Future research could also use qualitative design in addition to survey research to understand the factors responsible for development of PTG extensively.

CONCLUSION

This study represents an initial exploration of the relationship among resilience, perceived social support, and posttraumatic growth (PTG) among hemodialysis patients in Pakistan. The findings revealed resilience and social support as critical factors for enhancing PTG levels in these patients. The study has implications for healthcare providers. The clinicians working with these patients may check for the absence of resilience and PTG and provide psychological interventions to improve the psychological wellbeing of their clients. Through this intervention, patients could transform their adversity into positive growth by boosting their resilience and improving their social support. Counseling services could also be planned at healthcare centers for these patients to increase their PTG effectively.

IMPLICATIONS AND FUTURE DIRECTIONS

To enhance the psychological wellbeing of hemodialysis patients, healthcare providers should conduct regular screenings to assess resilience and posttraumatic growth (PTG), allowing for targeted psychological interventions for those in need. Clinicians are encouraged to design tailored interventions specifically aimed at enhancing resilience and PTG, fostering a positive psychological environment and overall wellbeing. Recognizing the importance of resilience and social support, healthcare professionals should guide patients in transforming adversity into positive growth through targeted support, empowering them to face their health challenges with a more positive outlook. Additionally, integrating counseling services tailored for hemodialysis patients at healthcare centers can provide a structured platform for emotional and psychological growth. A collaborative care model involving healthcare providers, psychologists, and counselors is recommended to create a comprehensive support system addressing both the physical and psychological aspects of hemodialysis patients' health, ultimately contributing to a holistic approach that improves their quality of life and resilience.

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REFERENCES

Ahmad, M. M., & Al Nazly, E. K. (2015). Hemodialysis: Stressors and coping strategies. *Psychology, Health & Medicine*, *20*(4), 477-487. https://doi.org/10.1080/13548506.2014.952239

Alshraifeen, A., Al-Rawashdeh, S., Alnuaimi, K., Alzoubi, F., Tanash, M., Ashour, A., ... & Al-Ghabeesh, S. (2020). Social support predicted quality of life in people receiving hemodialysis treatment: A cross-sectional survey. *Nursing Open*, *7*(5), 1517–1525. https://dx.doi.org/10.10022Fnop2.533

Bensimon, M. (2012). Elaboration on the association between trauma, PTSD and posttraumatic growth: The role of trait resilience. *Personality and Individual Differences*, *52*(7), 782–787. https://doi.org/10.1016/j.paid.2012.01.011

Credle, L. (2020). Gratitude, Resilience and Posttraumatic Growth among Kidney Transplant Recipients.

Cui, C., Wang, K., An, J., & Jin, C. (2017). Current status and influencing factors of posttraumatic growth in maintenance hemodialysis. *International Journal of Nursing Sciences*, *4*(4), 362-366. https://doi.org/10.1016/j.ijnss.2017.09.008

Eke, O. H., Chukwuma, G. E., Ebulum, G. C., & Onyenyirionwu, U. G. (2019). Family Relationship and Gender as Correlates of Posttraumatic Growth among Parents of Neonatal Death. *Journal of Women's Health and Development*, *2*(2), 29-36.

Greup, S. R., Kaal, S. E., Jansen, R., Manten-Horst, E., Thong, M. S., van der Graaf, W. T., ... & Husson, O. (2018). Posttraumatic growth and resilience in adolescent and young adult cancer patients: An overview. *Journal of adolescent and young adult oncology*, *7*(1), 1-14.

Hamama-Raz, Y., Nativ, S., & Hamama, L. (2021). Posttraumatic Growth in Inflammatory Bowel Disease Patients: The Role of Illness Cognitions and Physical Quality of Life. *Journal of Crohn's and Colitis*, *15*(6), 1060-1067.

Hasson-Ohayon, I., Tuval-Mashiach, R., Goldzweig, G., Levi, R., Pizem, N., & Kaufman, B. (2016). The need for friendships and information: dimensions of social support and posttraumatic growth among women with breast cancer. *Palliative & supportive care*, *14*(4), 387-392.

Hiew, C. C., Mori, T., Shimizu, M., & Tominaga, M. (2000). Measurement of resilience development: Preliminary results with a State-Trait resilience inventory. *Journal of Learning and Curriculum Development*, *1*, 111–117.

Kamran, F., & Ogden, J. (2016). Transitions in psychological wellbeing and life orientation: the phenomenon of posttraumatic growth after renal transplantation. *Pakistan Journal of Psychological Research*, 419-440.

Kiani, L., Rafeipoor, A., Mashayekh, M., Tajbakhsh, R., & Pouyamanesh, J. (2019). The relationship between resilience and post traumatic growth in patients on hemodialysis in Karaj in 2018. *Journal of Ilam University of Medical Sciences, 27(3), 56-63*

Lelorain, S., Bonnaud-Antignac, A., & Florin, A. (2010). Long term posttraumatic growth after breast cancer: prevalence, predictors and relationships with psychological health. *Journal of clinical psychology in medical settings*, *17*(1), 14-22.

Lai, H. L., Hung, C. M., Chen, C. I., Shih, M. L., & Huang, C. Y. (2020). Resilience and coping styles as predictors of health outcomes in breast cancer patients: A structural equation modelling analysis. *European Journal of Cancer Care*, *29*(1), e13161.

Li, T., Liu, T., Han, J., Zhang, M., Li, Z., Zhu, Q., & Wang, A. (2018). The relationship among resilience, rumination and posttraumatic growth in hemodialysis patients in North China. *Psychology, health & medicine*, *23*(4), 442-453.

Liu, Y. M., Chang, H. J., Wang, R. H., Yang, L. K., Lu, K. C., & Hou, Y. C. (2018). Role of resilience and social support in alleviating depression in patients receiving maintenance hemodialysis. *Therapeutics and clinical risk management*, *14*, 441.

López, J., Camilli, C., & Noriega, C. (2015). Posttraumatic growth in widowed and non-widowed older adults: Religiosity and sense of coherence. *Journal of religion and health*, *54*(5), 1612-1628.

Lotfi, K. F., Taheri, A., Mirzaee, H. R., & Masoudi, M. Z. (2013). Relationship between social support and self-esteem with depression and anxiety in cancer patients. *Journal of new findings in Psychology, 7*(25), 101-15.

Magid, K., El-Gabalawy, R., Maran, A., & Serber, E. R. (2019). An examination of the association between posttraumatic growth and stress symptomatology in cardiac outpatients. *Journal of clinical psychology in medical settings*, *26*(3), 271-281.

Manning, L. K., Carr, D. C., & Kail, B. L. (2016). Do higher levels of resilience buffer the deleterious impact of chronic illness on disability in later life? *The Gerontologist*, *56*(3), 514-524.

Min, J. A., Yoon, S., Lee, C. U., Chae, J. H., Lee, C., Song, K. Y., & Kim, T. S. (2013). Psychological resilience contributes to low emotional distress in cancer patients. *Supportive care in cancer*, *21*(9), 2469–2476.

Mystakidou, K., Tsilika, E., Parpa, E., Kyriakopoulos, D., Malamos, N., & Damigos, D. (2008). Personal growth and psychological distress in advanced breast cancer. *The Breast*, *17*(4), 382-386.

Peng, X., Su, Y., Huang, W., & Hu, X. (2019). Status and factors related to posttraumatic growth in patients with lung cancer: A STROBE-compliant article. *Medicine*, *98*(7).

Reckert, A., Hinrichs, J., Pavenstädt, H., Frye, B., & Heuft, G. (2013). Prevalence and correlates of anxiety and depression in patients with end-stage renal disease (ESRD). *Zeitschrift fur Psychosomatische Medizin und Psychotherapie*, *59*(2), 170-188.

Saboor, F., & Malik, N. (2024). Interplay of Sleep Quality, Insomnia and Quality of Life in Individuals Undergoing Hemodialysis: Insomnia and Quality of Life. *Pakistan Journal of Health Sciences*, *5*(3), 68-72.

Sadeghpour, F., Heidarzadeh, M., Naseri, P., Nadrmohammadi, M., Nasiri, E., Jafary, B., & Izady Dargahlou, M. (2019). The relationship between emotional intelligence and posttraumatic growth in hemodialysis patients. *Journal of Health and Care*, *21*(1), 7-15.

Shahgholian, N., & Yousefi, H. (2018). The lived experiences of patients undergoing hemodialysis with the concept of care: a phenomenologicalstudy. *BMCnephrology*, *19*(1), 1–7.

Sheerazi, S., & Kamran, F. (2020). Resilience and Posttraumatic Growth in Renal Transplant Recipients. *Journal of Behavioural Sciences*, *30*(1), 77.

Sheikh, A. I. (2004). Posttraumatic growth in the context of heart disease. *Journal of Clinical Psychology in Medical Settings*, *11*(4), 265–273.

Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of traumatic stress*, *9*(3), 455-471.

Tedeschi, R. G., & Calhoun, L. G. (2004). "Posttraumatic growth: conceptual foundations and empirical evidence". *Psychological Inquiry*, *15*(1), 1-18.

Theodoritsi, A., Aravantinou, M. E., Gravani, V., Bourtsi, E., Vasilopoulou, C., Theofilou, P., & Polikandrioti, M. (2016). Factors associated with the social support of hemodialysis patients. *Iranian journal of public health*, *45*(10), 1261.

Tomaszek,A.,Wróblewska, A., Zdankiewicz-Ścigała, E., Rzońca, P., Gałązkowski, R., Gozdowska, J., ... & Danielewicz, R. (2021). Posttraumatic Growth among Patients after Living and Cadaveric Donor Kidney Transplantation: The Role of Resilience and Alexithymia. *International Journal of Environmental Research and Public Health*, *18*(4), 2164.

Willie, T. C., Overstreet, N. M., Peasant, C., Kershaw, T., Sikkema, K. J., & Hansen, N. B. (2016). Anxiety and depressive symptoms among people living with HIV and childhood sexual abuse: The role of shame and posttraumatic growth. *AIDS and Behavior*, *20*(8), 1609-1620.

Yorulmaz, H., Bayraktar, S., & Özdilli, K. (2010). Posttraumatic growth in chronic kidney failure disease. *Procedia-Social and Behavioral Sciences*, *5*, 2313-2319.

Yucetin, L., Bozoklar, C. A., Yanik, O., Tekin, S., Tuncer, M., & Demirbas, A. (2015). An investigation of posttraumatic growth experiences among living kidney donors. In *Transplantation proceedings* (Vol. 47, No. 5, pp. 1287-1290). Elsevier.

Ziadi, A. A., Heshmati, R., Nemati, F., & Hashemi, T. (2023). The relationship of resilience and social support with posttraumatic growth: The mediating role of emotion regulation strategies. *International Journal of Health Sciences*, *7*(S1), pp. 749–760. https://doi.org/10.53730/ijhs.v7nS1.14267

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, *52*(1), 30–41.