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Unveiling the power of optimism, social support, and psychological resilience in kidney cancer patients

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Abstract: The present study aimed to examine the relationships among optimism, social support, and psychological resilience in kidney cancer patients. A cross-sectional design was employed with 131 participants, who completed a questionnaire including demographic information, the Connor-Davidson Psychological Resilience Scale, the Multidimensional Perceived Social Support Scale, and the Optimism Scale. Results indicated that males reported higher levels of optimism and social support than females, although gender did not significantly influence psychological resilience. Younger patients exhibited higher social support, optimism, and resilience compared to older adults. Regarding disease stage, optimism was highest in Stage I, whereas perceived social support and psychological resilience peaked in Stage II, suggesting greater coping efforts and engagement with support during treatment. Correlation and regression analyses demonstrated that higher optimism and social support particularly from family and friends were significantly associated with enhanced psychological resilience, with optimism moderating the impact of social support on resilience. The strong interrelationships among the sub-dimensions of social support highlight the integrated role of social resources in promoting well-being. These findings underscore the importance of fostering optimism and social support through tailored psychosocial interventions, which may strengthen coping strategies and overall quality of life throughout the kidney cancer trajectory.

Keywords: kidney cancer; optimism; social support; resilience

1. Introduction

Kidney cancer is the 14th most prevalent cancer worldwide, with approximately 750,000 new diagnoses and 175,000 deaths reported each year [1]. In Turkey, it accounts for 3.1% of common cancers across all age groups and genders [2]. The incidence is expected to rise in the coming years, largely due to population aging and an increase in major risk factors such as obesity, smoking, and hypertension [3,4]. Enhanced screening methods and greater awareness may also contribute to detection bias. The diagnosis of kidney cancer can lead to significant physiological, psychological, and social challenges, which in turn may exacerbate mental health issues such as depression, anxiety, and elevated psychological distress [5]. These psychological difficulties are associated with adverse clinical outcomes, including impaired immune function, delayed recovery, poor symptom control, reduced treatment adherence, and lower survival rates [6]. Consequently, routine psychological assessment and support are critical components of comprehensive oncology care.

Positive psychological constructs such as social support, optimism, and resilience play a crucial role in helping patients adapt to illness-related challenges. Adequate social support is strongly associated with reduced psychological distress, enhanced

well-being, and may even lower mortality risk in cancer populations [7–10]. Optimism, defined as the expectation of favorable future outcomes, has been linked to lower distress and depression, better health-related quality of life, and more effective coping strategies in cancer patients [11,12]. Resilience, the dynamic capacity to cope with adversity, is closely related to personal traits such as optimism, self-esteem, and self-efficacy [13–15]. Structured interventions have been shown to enhance resilience, which in turn improves adaptive coping and overall quality of life [16,17]. Psychosocial interventions that foster hope, optimism, and proactive problem-solving can alleviate physical, emotional, and social difficulties, thereby supporting mental health and resilience in cancer patients [18].

Despite growing evidence on the beneficial roles of optimism, social support, and resilience, most research has focused on cancers such as breast [17] and colorectal [18]. The interplay among these positive psychological constructs in kidney cancer patients, who face unique physiological and psychological challenges, has been insufficiently explored. Accordingly, this study aims to address this gap by investigating the relationships between optimism, social support, and psychological resilience specifically in kidney cancer patients. Findings from this research may inform targeted psychosocial interventions designed to enhance resilience and improve quality of life in this understudied population.

2. Materials and methods

2.1. Study design and sample

A cross-sectional study was conducted with 131 kidney cancer patients (93 males, 38 females) consecutively admitted to the Erciyes University Urology Department between February 2024 and October 2024. Eligibility criteria included: age ≥ 18 years, diagnosis within the previous 12 months, awareness of their cancer diagnosis, and adequate proficiency in Turkish. Patients with prior psychiatric disorders, cognitive impairments, or other active cancers were excluded. To minimize selection bias, eligibility was assessed by the attending physicians, and all participants provided written informed consent.

Clinical data were obtained from medical records, and self-report questionnaires were administered at admission. The study received ethical approval from the Cappadocia University Ethics Committee and adhered to the Helsinki Declaration, ensuring participant confidentiality and anonymity.

Sample Size Justification: An a priori power analysis was conducted using G*Power 3.1 for ANOVA and hierarchical regression analyses. Assuming a medium effect size ($f = 0.25$), $\alpha = 0.05$, and power $(1 - \beta) = 0.80$, the required sample size was estimated at 128 participants, confirming that the present sample ($N = 131$) was adequate to detect significant effects. Cancer stage refers to the clinical TNM classification (Stages I–IV). Type of stage indicates whether the disease is localized, locally advanced, or metastatic. Treatment type refers to the primary therapeutic intervention, e.g., surgery, chemotherapy, targeted therapy, or combined treatment.

2.2. Research questions

What are the current levels of optimism, social support, and psychological resilience among kidney cancer patients?

How are demographic variables [e.g., age, gender, cancer stage] associated with optimism, social support, and psychological resilience among kidney cancer patients?

What are the interrelationships among optimism, social support, and psychological resilience in individuals diagnosed with kidney cancer?

2.3. Research tools

2.3.1 Sociodemographic and health questionnaire

Sociodemographic and health-related data are collected from kidney cancer patients to describe the study sample and to evaluate relationships between key variables. These data include basic demographic information such as gender, age, marital status, level of education, employment status, and monthly household income. In addition, information related to the disease is obtained, including the current stage of the disease [Stage I, II, III and IV] early stage, advanced stage, or metastatic], history of previous surgeries, and the type of treatment currently being received [such as chemotherapy, immunotherapy, radiotherapy, or targeted therapy].

2.3.2. Connor-Davidson psychological resilience scale

The Connor-Davidson Resilience Scale [CD-RISC], developed in 2003, was used to assess psychological resilience in kidney cancer patients. The scale consists of 25 items rated on a 5-point Likert scale [0 = Never true to 4 = Always true], yielding a total score ranging from 0 to 100. Higher scores indicate greater resilience. Exploratory and confirmatory factor analyses supported a three-factor structure Personal Competence, Tolerance of Negative Affect, and Spirituality accounting for 52% of the variance. However, it is recommended to use the total score for analysis. In the current study, the scale demonstrated high internal consistency, with a Cronbach's alpha of .91.

2.3.3. Multidimensional perceived social support scale

The Multidimensional Scale of Perceived Social Support [MSPSS], developed by Zimet et al. [19] was used to assess social support perceptions in kidney cancer patients. The 12-item scale uses a 7-point Likert format [1 = Absolutely No to 7 = Absolutely Yes] and comprises three subscales—Family [items 3, 4, 8, 11], Friends [6, 7, 9, 12], and Significant Other [1, 2, 5, 10]—each with 4 items. Together, the factors explain 75% of the total variance. Total scores range from 12 to 84, with higher scores indicating greater perceived social support. The Turkish validity and reliability of the Multidimensional Scale of Perceived Social Support were demonstrated by Eker et al. [20], with the scale showing strong internal consistency as indicated by Cronbach's alpha coefficients ranging from approximately .80 to .95 across the total scale and its subscales. In the present study, the Cronbach's alpha was 0.88, indicating high internal consistency.

2.3.4. Optimism Scale

The Optimism Scale, originally developed by Scheier et al. [21] to assess individuals' self-perceived optimism. The scale comprises 24 items rated on a four-

point Likert scale, with total scores ranging from 24 to 96; higher scores indicate greater optimism. In the Turkish validation study, the internal consistency [Cronbach's alpha] was 0.96, test-retest reliability was 0.61, and split-half reliability was 0.91. In the present study, the Cronbach's alpha was 0.89, indicating high internal consistency.

2.4. Statistical analysis

Data was analyzed using SPSS for Windows [v.26]. Descriptive statistics [mean and standard deviation] were used to summarize sample characteristics. Independent samples t-tests and one-way ANOVA were conducted to examine differences in optimism, social support, and psychological resilience based on background variables. Pearson's correlation coefficients assessed the relationships among key variables. Statistical significance was set at $p < 0.05$, and results are presented in the following section.

3. Results

The sociodemographic and health-related characteristics of the participants are summarized in **Table 1**. The sample predominantly consisted of males (71%) and older adults, with the majority aged 51 years or above. Most participants were married (73%), while 22% were divorced or separated, and 5% were single. Regarding disease stage, the largest proportion of participants were in Stage II (45%), followed by Stage I (28%) and Stage III (21%), indicating that most patients were in early to intermediate stages of kidney cancer. Surgical intervention was the most common treatment (66%), with radiotherapy (11%) and chemotherapy (8%) reported less frequently. Over half of the participants had been diagnosed within the past 1–3 years, while smaller proportions were diagnosed less than a year ago (26%), between 3–5 years (13%), or more than five years ago (6%). Overall, the sample primarily comprised older, married males in the early to middle stages of illness who had undergone surgical treatment and were diagnosed within the past three years. Detailed counts and percentages for each variable are provided in **Table 1**.

Table 1. Sociodemographic and health variables ($n = 131$).

	<i>N (%)</i>
Gender	
Female	38 (29.01)
Male	93 (70.99)
Age	
<50 years	13(9.92)
51–60 years	56 (42.75)
over 61 years	62 (47.33)
Marital status	
Single	6 (4.58)
Married	96 (73.28)
Divorced/separated	29 (22.14)
Stage	

Table 1. (Continued).

	N (%)
Stage I	37 (28.24)
Stage II	59 (45.04)
Stage III	28 (21.37)
Stage IV	7 (5.34)
Type of treatment	
Chemotherapy	10 (7.63)
Radiotherapy	14 (10.69)
Surgical	86 (65.65)
Time since initial diagnosis	
Less than 1 year	34 (25.95)
1-3 years	72 (54.96)
3-5 years	17 (12.98)
Over 5 years	8 (6.1)

Table 2 presents gender-based differences in social support, optimism, and psychological resilience. Males reported significantly higher perceived social support ($M = 3.58$, $SD = 0.63$) compared to females ($M = 2.96$, $SD = 0.52$), with this difference reaching statistical significance [$t(129) = 5.41$, $p < 0.01$, 95% CI (0.39, 0.84)]. Similarly, men exhibited higher optimism scores ($M = 3.52$, $SD = 0.72$) than women ($M = 3.11$, $SD = 0.75$), with a statistically significant difference [$t(129) = 3.41$, $p < 0.01$, 95% CI (0.18, 0.63)], confirmed by post-hoc analysis. Psychological resilience was also higher in men ($M = 3.60$, $SD = 0.69$) than women ($M = 3.22$, $SD = 0.66$), and this difference was statistically significant [$t(129) = 2.82$, $p < 0.05$, 95% CI (0.07, 0.73)]. These results indicate that males in this sample reported higher social support, optimism, and psychological resilience than females.

Table 2. Differences in optimism, social support, psychological resilience by gender.

Gender	Male ($n = 93$) M (SD)	Female ($n = 38$) M (SD)	df	t-value	95% CL		Post-hoc comparison
					LL	UL	
Social support	3.58 (0.63)	2.96 (0.52)	129	5.41**	0.39	0.84	
Optimism	3.52 (0.72)	3.11 (0.75)	129	3.41**	0.18	0.63	Male > Female
Psychological resilience	3.6 (0.69)	3.22 (0.66)	129	2.82*	0.07	0.73	

Note: ** $p < 0.01$.

The analysis examined differences in social support, optimism, and psychological resilience across three age groups: under 50 years, 51–60 years, and over 61 years (**Table 3**). A significant difference in perceived social support was observed [$F(2, 128) = 4.62$, $p < 0.05$], with post-hoc comparisons indicating that participants under 50 ($M = 4.21$, $SD = 0.50$) and those aged 51–60 ($M = 3.80$, $SD = 0.80$) reported higher social support than those over 61 ($M = 3.60$, $SD = 0.90$). For optimism, a significant age effect was found [$F(2, 128) = 5.24$, $p < 0.01$]. Younger participants (<50 years; $M = 3.70$, $SD = 0.40$) exhibited higher optimism than both the 51–60 years ($M = 3.10$, $SD = 0.70$) and over-61 years ($M = 2.90$, $SD = 0.80$) groups,

which did not differ significantly from each other. Regarding psychological resilience, a significant difference emerged among age groups [$F(2, 128) = 3.90, p < 0.05$]. Post-hoc tests showed that the youngest group (<50 years; $M = 3.90, SD = 0.50$) had higher resilience than the 51–60 years group ($M = 3.50, SD = 0.60$), with the oldest group (>61 years; $M = 3.70, SD = 0.70$) scoring slightly higher than the middle group (Table 3).

Overall, these findings indicate that younger participants tend to report higher levels of social support, optimism, and psychological resilience, whereas older adults, particularly those over 61, report lower social resources and optimism, with resilience showing a slight variation between middle-aged and older participants.

Table 3. ANOVA results for social support, optimism, and psychological resilience across age groups.

	Age	n	M	SD	F-Value	95% CI		Post-hoc
						LL	UL	
Social Support	<50 years (a)	13	4.21	0.5	4.62*	−0.28	0.27	$a > c$
	51–60 years (b)	56	3.80	0.8		−0.82	0.63	$b > c$
	over 61 years (c)	62	3.60	0.9		−0.28	0.11	
Optimism	<50 years (a)	13	3.70	0.4	5.24**	−1.52	0.44	$a > b = c$
	51–60 years (b)	56	3.10	0.7		0.62	0.24	
	over 61 years (c)	62	2.90	0.8		−2.47	0.96	
Psychological resilience	<50 years (a)	13	3.90	0.5	3.90	−0.74	0.01	$a > b > c$
	51–60 years (b)	56	3.50	0.6		−1.08	−0.22	
	over 61 years (c)	62	3.70	0.7		0.08	0.63	

Note: * $p < 0.05$; ** $p < 0.01$.

The one-way ANOVA results examining differences across age stages in optimism, social support, and psychological resilience are presented in Table 4. A significant main effect of age stage was found for social support, $F(3, 127) = 3.17, p = 0.027$. Post-hoc Tukey comparisons indicated that participants in Stage II reported significantly higher social support compared to those in Stage I and Stage IV, suggesting that mid-life adults may perceive greater available social resources. The 95% confidence intervals (−0.56 to −0.08 and 0.07 to 0.88) further support these differences.

For optimism, the main effect of age stage was not statistically significant, $F(3, 127) = 1.35, p = 0.26$. As expected, no post-hoc comparisons were performed, and group means should be interpreted descriptively only. These results indicate that optimism levels are relatively stable across age groups in this sample.

A significant age effect emerged for psychological resilience, $F(3, 127) = 3.18, p = 0.032$. Post-hoc analyses revealed that Stage II participants exhibited significantly higher resilience than those in Stage III. The corresponding confidence interval (0.09 to 0.65) supports this group difference. No other pairwise comparisons reached significance. Overall, age stage was associated with meaningful differences in social support and psychological resilience but not optimism. Mid-life participants (Stage II) consistently showed more favorable psychological characteristics than other age stages (Table 4).

Table 4. Mean scores, standard deviations, and ANOVA results for social support, optimism, and psychological resilience across kidney cancer stages.

	Stages	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i> -value	<i>P</i>	95%CI		Post-hoc
							LL	UL	
Social support	Stage I (<i>a</i>)	37	3.45	0.52	3.17	0.027	−0.56	−0.08	<i>b</i> > <i>a</i> , <i>b</i> > <i>d</i>
	Stage II (<i>b</i>)	59	3.86	0.62			0.07	0.88	
	Stage III (<i>c</i>)	28	3.38	0.41			-	-	
	Stage IV (<i>d</i>)	7	3.24	0.39			-	-	
Optimism	Stage I (<i>a</i>)	37	4.01	0.55	1.35**	0.26	-	-	No significance
	Stage II (<i>b</i>)	59	3.78	0.96					
	Stage III (<i>c</i>)	28	3.71	0.36					
	Stage IV (<i>d</i>)	7	3.55	0.66					
Psychological resilience	Stage I (<i>a</i>)	37	3.36	0.44	3.18**	0.32	0.09	0.65	<i>b</i> > <i>c</i>
	Stage II (<i>b</i>)	59	3.64	0.56					
	Stage III (<i>c</i>)	28	3.39	0.64					
	Stage IV (<i>d</i>)	7	3.08	0.49					

Note: **p* < 0.05; ***p* < 0.01.

Multicollinearity diagnostics

To evaluate multicollinearity, Tolerance and Variance Inflation Factor (VIF) values were examined. Social support and its sub-dimensions showed substantial multicollinearity (VIF values ranging from 7.14 to 9.09; Tolerance < 0.15), exceeding commonly accepted thresholds. Optimism and demographic variables demonstrated acceptable levels (VIF < 2). Given this multicollinearity, the regression model was revised by entering only the total social support score, instead of sub-dimensions, into the hierarchical regression **Table 5**.

High multicollinearity was observed among the social support sub-dimensions, consistent with their strong intercorrelations. Therefore, the revised regression model used only the composite social support score to avoid unstable parameter estimates.

Table 5. Multicollinearity diagnostics (VIF and Tolerance) for regression predictors.

Predictor	Tolerance	VIF
Optimism	0.73	1.36
Social support	0.11	9.09
Social support-friends	0.12	8.33
Social support-family	0.14	7.14
Age	0.82	1.22
Gender	0.88	1.13
Disease duration	0.79	1.26

A simple slopes analysis was conducted to examine the moderating role of social support (**Figure 1**). The effect of optimism on psychological resilience was non-significant at low levels of social support (*b* = 0.18, *p* = 0.103), significant at moderate levels (*b* = 0.42, *p* < 0.001), and strongest at high levels of social support (*b* = 0.61, *p*

< 0.001). These findings indicate that optimism contributes more strongly to resilience when individuals report higher perceived social support. (**Table 6**)

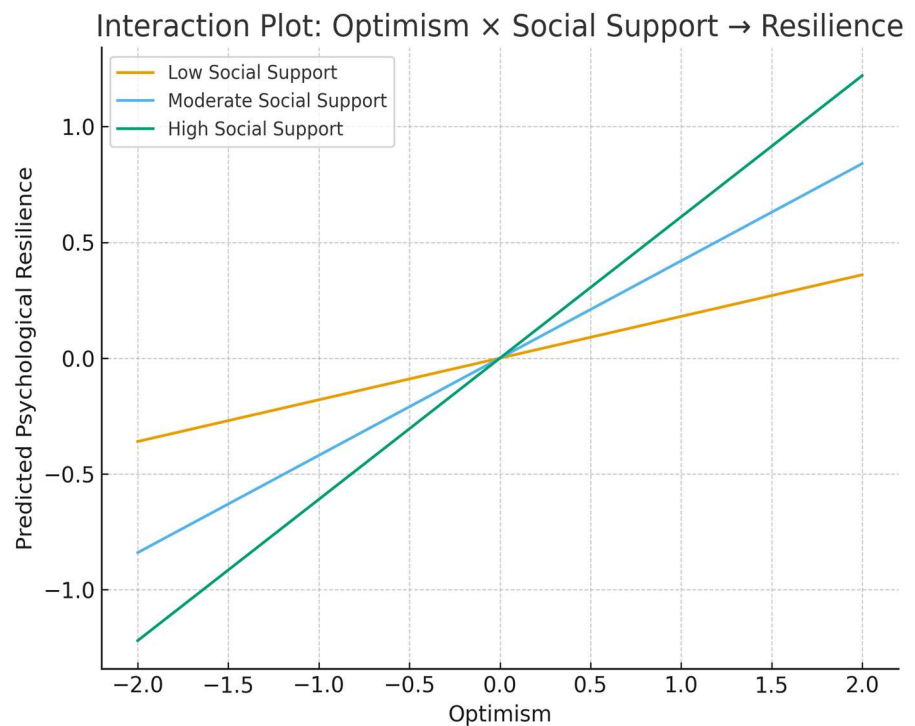


Figure 1. Interaction plot illustrates the moderating effect of social support on the relationship between optimism and psychological resilience.

Table 6. Simple slopes analysis for the interaction between optimism and social support predicting psychological resilience.

Level of social support	<i>b</i>	SE	<i>t</i>	<i>p</i>	95% CI (LL-UL)
Low (−1 SD)	0.18	0.11	1.64	0.103	−0.04–0.40
Moderate (Mean)	0.42	0.07	6.21	<0.001	0.28–0.55
High (+1 SD)	0.61	0.10	5.93	<0.001	0.40–0.82

Note: Low, moderate, and high values of social support correspond to −1 SD, mean, and +1 SD, respectively.

Table 7 presents the results of the correlation analysis examining the relationships among optimism, social support [including its sub-dimensions], and psychological resilience. The findings reveal significant positive correlations among all variables. Optimism was moderately and positively correlated with overall social support [$r = 0.37, p < 0.01$], support from friends [$r = 0.56, p < 0.01$], support from family [$r = 0.32, p < 0.01$], and psychological resilience [$r = 0.62, p < 0.01$]. Similarly, overall social support showed strong positive associations with friend support [$r = 0.93, p < 0.01$] and family support [$r = 0.75, p < 0.01$], as well as with psychological resilience [$r = 0.68, p < 0.01$]. Psychological resilience was also significantly correlated with support from friends [$r = 0.58, p < 0.01$] and support from family [$r = 0.63, p < 0.01$].

Table 7. Correlation analysis of optimism, social support and psychological resilience.

	1	2	3	4	5
Optimism	1				
Social Support	0.37**	1			
Social Support-Friends	0.56**	0.93**	1		
Social Support-Family	0.32**	0.75**	0.83**	1	
Psychological Resilience	0.62**	0.68**	0.58**	0.63**	1
M	3.23	3.82	3.86	3.49	3.61
SD	0.45	0.72	0.86	0.96	0.63

* $p < 0.05$; ** $p < 0.01$.

These results suggest that higher levels of optimism and perceived social support, particularly from friends and family, are associated with greater psychological resilience. Additionally, the strong intercorrelations among the sub-dimensions of social support highlight the interconnected nature of social resources in promoting well-being.

A three-step hierarchical multiple regression analysis was conducted to evaluate the predictive and interactive effects of optimism and social support on psychological resilience after controlling for demographic and clinical characteristics. In Model 1, control variables including age, gender, cancer stage, type of stage, treatment type, and disease duration were entered. These variables accounted for 9% of the variance in psychological resilience ($R^2 = 0.09$). In Model 2, optimism and social support were added as psychological predictors, significantly increasing the explained variance to 36% ($\Delta R^2 = 0.27, p < 0.001$). Both optimism ($\beta = 0.44, p < 0.001$) and social support ($\beta = 0.38, p < 0.001$) were found to be significant predictors of psychological resilience. In Model 3, the inclusion of the optimism $\times$ social support interaction term further enhanced the model's explanatory power ($\Delta R^2 = 0.11, p < 0.001$), indicating a moderating effect. Specifically, the positive impact of optimism on psychological resilience was stronger among individuals reporting higher levels of perceived social support. These findings highlight the synergistic role of optimism and social support in fostering psychological resilience among kidney cancer patients (Table 8).

Table 8. Hierarchical multiple regression predicting psychological resilience and sociodemographic variables.

Model/variable	B	SE B	β	t	p	R^2	ΔR^2
Model 1: Control Variables						.09	—
Age	0.07	0.05	0.12	1.42	0.158		
Gender	0.14	0.09	0.11	1.53	0.129		
Cancer Stage	-0.10	0.06	-0.15	-1.66	0.099		
Type of Stage	-0.09	0.07	-0.10	-1.32	0.188		
Treatment Type	0.11	0.06	0.13	1.78	0.077		
Disease Duration	0.10	0.05	0.15	1.97	0.051		
Model 2: Psychological Predictors						0.36	0.27***
Optimism	0.42	0.07	0.44	6.21	<0.001		
Social Support	0.35	0.08	0.38	5.12	<0.001		

Table 8. (Continued).

Model/variable	B	SE B	β	<i>t</i>	<i>p</i>	<i>R</i> ²	ΔR^2
Model 3: Interaction Term						0.47	0.11***
Optimism × Social Support	0.21	0.06	0.33	3.98	<0.001		

p* < 0.05, *p* < 0.01, ****p* < 0.001.

4. Discussion

This study examined the relationships between optimism, social support, and psychological resilience in kidney cancer patients. Consistent with prior research, support from family and friends was a key contributor to psychological resilience, while optimism further strengthened patients' ability to adapt to cancer-related challenges [22,23]. These findings highlight that positive psychological constructs are important resources for coping with the multifaceted stressors associated with cancer, including emotional, social, and physical challenges.

The results suggest a synergistic relationship between optimism and social support in fostering resilience. Patients reporting higher levels of social support appeared to benefit more from an optimistic outlook, consistent with the stress-buffering model. According to this framework, social support can mitigate the impact of stressors on psychological outcomes by providing emotional, informational, and practical resources, thereby enhancing patients' capacity to cope with adversity [24]. In this context, social support may reinforce patients' confidence and hope, amplifying the potential benefits of optimism without implying direct causality.

From a positive psychology perspective, optimism and resilience were closely interrelated, supporting the notion that fostering positive expectations may facilitate adaptive coping even under serious illness [25]. Higher resilience was associated with greater flexibility in managing setbacks, uncertainty, and interpersonal challenges, reflecting enhanced psychological coping [26]. The observed interaction between optimism and social support suggests these resources operate synergistically rather than independently, offering potential targets for future psychosocial interventions while acknowledging the study's cross-sectional design.

Demographic patterns provided additional nuance. Younger patients reported higher perceived social support, whereas older patients may rely more on available support to manage treatment-related challenges. Gender differences emerged in levels of optimism and perceived support, though psychological resilience did not differ significantly between men and women [27]. These findings suggest that psychosocial resources may shape resilience more than demographic characteristics and indicate that interventions could be tailored to patients' age and social context.

The interactive effect of optimism and social support carries implications for psychosocial care. While the cross-sectional design limits causal inference, the findings suggest that interventions combining optimism-enhancing strategies with strengthened social support such as cognitive-behavioral techniques and structured social engagement programs may be beneficial. Patients with supportive social environments may particularly benefit from optimism-focused interventions, whereas those with lower perceived support may first require programs that foster social connections.

Overall, these results underscore the broader clinical relevance of psychosocial resources. Social support has been linked to improved treatment adherence, reduced depression and anxiety, and enhanced quality of life throughout the cancer journey [26,28,29]. Optimism contributes to psychological well-being by shaping coping strategies and emotional regulation [30]. In kidney cancer patients, the combined effect of optimism and social support appears particularly important, highlighting the value of integrated psychosocial approaches that consider both individual psychological traits and the social environment. While the findings cannot establish causality, they provide evidence that promoting positive psychological resources may support resilience, adaptive coping, and well-being in this population [31,32].

5. Limitations

Several limitations should be acknowledged. First, the cross-sectional design limits the ability to draw causal inferences between resilience, social support, and optimism. Although hierarchical multiple regression analyses were employed to examine predictive and interactive effects among key psychological variables, longitudinal or experimental designs are required to establish temporal or causal relationships. Second, the use of self-reported measures may introduce recall and response biases, highlighting the potential for common method bias; future studies should consider combining subjective and objective assessments. Third, the study was conducted at a single center in Türkiye, which may limit generalizability and indicates that findings may not extend to other cultural or healthcare contexts. Fourth, multicollinearity among social support subscales was observed and should be explicitly acknowledged as a limitation despite statistical adjustments in the regression analyses. Fifth, key clinical variables such as sleep quality and health-related quality of life were not assessed and warrant further investigation in future research. Finally, the relatively small sample size may constrain the robustness and external validity of the findings.

6. Conclusion

This study highlights the importance of optimism, social support, and psychological resilience in supporting psychological well-being and quality of life among kidney cancer patients. Given the elevated risk for psychological distress in this population, interventions targeting these psychosocial factors may be beneficial. While causal inferences cannot be drawn due to the cross-sectional design, potential strategies include CBT-based optimism enhancement programs, structured social support interventions such as peer-support groups, family engagement initiatives, and psychoeducational workshops. Encouraging active involvement of family and friends, fostering peer networks, and providing targeted resources may help strengthen emotional resilience and adaptive coping. Future research should continue to explore these variables longitudinally to better understand their role in promoting resilience and well-being. Collectively, these approaches offer practical, evidence-aligned guidance for supporting kidney cancer patients while maintaining appropriate caution regarding causal interpretations.

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Informed consent statement: Informed consent was obtained from all subjects involved in the study.

Conflict of interest: The authors declare no conflict of interest.

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