Psychosocial functioning, coping strategies, and social support in patients after surgical treatment of kidney cancer

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ABSTRACT

Introduction: Renal cell carcinoma (RCC) is one of the most common urinary tract cancers and its treatment, despite its efficacy, is often associated with a high psychological and social burden. With increasing incidence rates and improving survival, psychosocial aspects related to patients' functioning after surgical treatment are becoming increasingly important. The level of acceptance of the illness, coping strategies and the availability of social support appear to be particularly important.

The aim of this study was to assess the level of acceptance of the disease, coping strategies and the extent of social support received in patients after surgical treatment of RCC.

Materials and methods: Eighty-five patients undergoing surgical treatment at the Department of Urology and Urological Oncology of the Teaching Hospital No. 2 in Szczecin were included in the study. A diagnostic survey method and 3 tools were used: Acceptance of Illness Scale (AIS), Mental Adjustment to Cancer Scale (Mini-MAC) and Social Support Questionnaire (ISSB).

Results: The mean level of disease acceptance among patients was moderate (M = 24.89, SD = 6.37). The most frequently used coping strategy was fighting spirit (M = 22.38), while helplessness was the least used (M = 15.42). Constructive coping styles were prevalent (high level in 50.59% of respondents), whereas destructive styles were typically low (43.53%). Social support was reported at a moderate frequency across all domains (emotional, informational, instrumental, valuing), typically occurring once per week. Significant correlations were observed between age and positive reappraisal (r = 0.22, p = 0.043), and between helplessness and informational support (r = 0.263, p = 0.015). Respondents with secondary education demonstrated higher levels of fighting spirit compared to those with vocational education (p = 0.019).

Conclusions: Patients after surgical treatment of RCC presented moderate levels of disease acceptance and preferred constructive coping strategies. Social support was present to a moderate extent. Age and education influenced selected aspects of psychological adaptation, whereas no correlation was found between the level of disease acceptance and coping styles.

Keywords: kidney cancer; acceptance of the disease; coping strategies; social suport.

INTRODUCTION

Renal cell carcinoma (RCC) is one of the most frequently diagnosed cancers of the urinary tract and represents a major challenge for both modern oncology and clinical practice. In Poland, according to the National Cancer Registry, this neoplasm ranks seventh in terms of incidence in men and nineth in women [1]. The peak incidence is in the 6th–7th decade of life, and the incidence increases with age [2]. Risk factors for kidney cancer include smoking, obesity, hypertension, chronic kidney disease and genetic factors [3, 4]. The most common histological form of this cancer is RCC, which accounts for approx. 70–80% of all cases [5].

The diagnosis of RCC is often incidental and occurs during routine imaging performed for other reasons. Symptoms such as haematuria, low back pain or a palpable tumour in the abdominal cavity usually appear in the later stages of the disease [6]. The primary treatment is surgery – usually radical nephrectomy or partial nephron sparing surgery (NSS), depending on the stage of the tumour and the location of the lesion [7]. The prognosis of patients after surgical treatment depends mainly on the clinical stage of the disease, the presence of metastases and the general health of the patient [8].

Although surgical treatment of RCC represents the most effective form of intervention, the very fact of being diagnosed with cancer and its course are associated with a high psychological and social burden. Patients often experience anxiety, uncertainty, depression, as well as limitations in social, professional and family functioning [9]. In this context, it becomes extremely important to understand the psychosocial aspects of illness and recovery.

One of the key factors influencing patient functioning is the level of acceptance of the disease. The ability to accept a new health situation may translate into better coping with the disease and more effective adaptation to changes resulting from treatment and reduced quality of life [10]. Another important element is coping strategy – that is, how the patient interprets and responds to the threat of cancer. Tools such as the Mental Adjustment to Cancer (Mini-MAC) make it possible to distinguish between constructive (e.g. fighting spirit, positive reappraisal) and destructive adjustment styles (e.g. helplessness, anxiety preoccupation), which can modulate the course of psychological adaptation [11].

No less important is also social support, which can take various forms: emotional, informational, instrumental or social. This support has a positive impact on sense of security, coping effectiveness and levels of stress and psychological strain [12]. Patients

who receive adequate support from relatives, medical staff or others often adapt better to the illness and recover more quickly [13].

Despite a growing number of studies on the quality of life of oncology patients, the issue of psychosocial functioning of patients after surgical treatment of RCC is still under-researched. In particular, there is a lack of data on the associations between the level of acceptance of the disease, coping strategies and the type and frequency of social support received. Given these gaps in the current literature, it becomes essential to explore the psychosocial functioning of patients following surgical treatment of RCC.

The aim of this study was to assess the level of acceptance of the disease, the coping strategies used and the extent of social support received in patients after surgical treatment of RCC.

MATERIALS AND METHODS

Running and organisation of the study

The research used a diagnostic survey method with a questionnaire technique. The study was conducted at the Department of Urology and Oncological Urology of the University Clinical Hospital No. 2 in Szczecin in the period from July to September 2023, after obtaining the consent of the institution's management and the positive opinion of the Bioethics Committee of the Pomeranian Medical University in Szczecin (consent no. KB-0012/112/23).

The study group consisted of 85 patients after surgical treatment of RCC. Respondents were informed about the purpose and conduct of the study and the possibility to withdraw from participation at any stage of the study. All subjects gave informed consent to participate in the study.

Inclusion criteria:
— completion of surgical treatment for RCC, confirmed by medical documentation,
— a minimum of 4 weeks post-surgery to allow for basic somatic and psychological stabilization,
— age ≥18 years,
— provision of informed consent to participate in the study,
— ability to independently complete questionnaires and adequately comprehend the survey questions,
— proficiency in the Polish language sufficient to understand and respond to the survey items.

Exclusion criteria:
— lack of consent to participate in the study,
— incomplete completion of the survey questionnaires,
— currently undergoing intensive oncological treatment (e.g., chemotherapy, immunotherapy, radiotherapy) that could significantly affect psychological status and perceived social support,
— previously diagnosed severe psychiatric disorders (e.g., schizophrenia, bipolar affective disorder) that may impair the reliability of self-assessment,
— serious cognitive or neurological impairments (e.g., dementia, aphasia) that could interfere with accurate questionnaire completion,
— presence of terminal-stage comorbidities that may profoundly affect illness perception and coping strategies.

The questionnaires were distributed in hard copy form and completed independently by the respondents. After completion, participants deposited the questionnaires into a specially designated collection box. A total of 85 correctly completed questionnaires were qualified for analysis. Participants were informed that their participation was voluntary, anonymous, and that the collected data would be used solely for research purposes related to the study.

Research methods and tools

The study utilized standardized and validated psychometric instruments, alongside an original socio-demographic questionnaire, to comprehensively assess the psychosocial functioning of patients after surgical treatment of RCC. The following tools were used.

Socio-demographic and clinical questionnaire

A self-developed survey instrument designed to collect basic demographic data (e.g., age, gender, place of residence, marital status, education) as well as clinical information related to the patients' health status, course of oncological treatment, and subjective assessment of current health. The questionnaire aimed to identify potential covariates influencing psychological adaptation and social support.

Acceptance of Illness Scale

The Acceptance of Illness Scale (AIS), originally developed by Felton et al. and adapted into Polish by Juczyński, is a widely used instrument to measure the degree of illness acceptance. The AIS consists of 8 statements rated on a 5-point Likert scale (1 – strongly agree, 5 – strongly disagree), with total scores ranging from 8–40 points. Higher scores indicate greater acceptance of the disease and better psychological adaptation. The AIS demonstrates good internal consistency (Cronbach's alpha in Polish validation studies = 0.85) and is commonly applied in studies involving chronically ill and oncology patients [14].

Mini-Mental Adjustment to Cancer Scale

The Mini-MAC, developed by Watson et al. and adapted into Polish by Juczyński, is a 29-item tool designed to assess psychological adjustment to cancer. The scale evaluates 4 coping styles:
— fighting spirit (active, problem-focused approach to illness),
— positive reappraisal (searching for meaning and emotional growth through the illness experience),
— anxious preoccupation (persistent fear and worry regarding illness),
— helplessness/hopelessness (feelings of resignation and defeat).

Responses are scored on a 4-point Likert scale (1 – definitely does not apply to me, 4 – definitely applies to me). The tool enables the calculation of 2 higher-order factors: constructive coping (fighting spirit and positive reappraisal) and

destructive coping (anxious preoccupation and helplessness), offering a comprehensive profile of patient adaptation styles. In addition, the Mini-MAC allows the assessment of 2 styles of coping with cancer. Each consists of 2 strategies: a constructive style (strategies of fighting spirit and positive re-evaluation), and a destructive style (strategies of anxiety preoccupation and helplessness). Scores for both styles range from 14–56 and higher scores indicate greater intensity of behaviour associated with the style. Sten norms exist for the stated styles, and they allow for the interpretation of the scores. The most common assumption is that stens 5 and 6 indicate average values, stens 7–10 indicate high values and stens 1–4 indicate low values [15].

Inventory of Socially Supportive Behaviors
The ISSB, developed by Barrera and adapted by Łuszczyńska and Kowalska, is used to evaluate perceived social support across 4 domains:
− emotional support (e.g., empathy, love, care),
− informational support (e.g., advice, guidance, provision of knowledge),
− instrumental support (e.g., tangible help, services),
− appraisal support (e.g., affirmation, feedback, recognition).

The ISSB consists of 40 items rated on a 5-point frequency scale (0 – never, 4 – very often), allowing the estimation of the availability and type of support received by the respondent over the past month. The ISSB has demonstrated high psychometric properties, with Cronbach's alpha values exceeding 0.90 for all subscales [13].

Statistical analysis
Descriptive statistics (mean, median, standard deviation, quartiles) and inferential statistics (non-parametric tests: Spearman test, Kruskal–Wallis test, Dunn's test) were used to analyse the data. The level of statistical significance was taken as $p < 0.05$. Analyses were performed using the IBM SPSS Statistics package, version 28.0.

Based on the collected data, the following results were obtained.

RESULTS

Characteristics of the study group
The mean age of the respondents was 58.79 years (SD = 10.62), with the majority (70.59%) aged 51–70 years. Women constituted 54.12% of the participants. Most respondents were in formal relationships (45.88%) and had secondary education (51.76%). In terms of place of residence, the majority lived in small and medium-sized cities (61.18%).

Acceptance of the disease, coping strategies, social support
Data on the level of disease acceptance according to the AIS questionnaire in patients with RCC treated surgically were analysed. It was shown that the mean disease acceptance score in patients was 24.89 points, i.e. 3.11 points per question, meaning that respondents had a neutral attitude towards the disease (Tab. 1).

Analysis of the data on the coping strategies used according to the Mini-MAC by respondents with RCC treated surgically shows that respondents most frequently used the fighting spirit strategy (mean 22.38 points). Slightly less frequently, they used the strategies of positive re-evaluation (mean 22.33 points) and anxiety preoccupation (mean 17.75 points), and least frequently the strategy of helplessness – mean 15.42 points (Tab. 2).

Participants in the survey most often used a fighting spirit strategy, treated the illness as a personal challenge, and took action to combat the illness. Respondents somewhat less frequently used positive reappraisal strategies, were aware of the seriousness of the illness, but changed the way they perceived the illness, found hope and contentment with the years they had lived. Respondents were also less likely to use an anxiety preoccupation strategy, treating the illness as an anxiety-provoking threat. Respondents were least likely to use a strategy of helplessness, expressing a sense of powerlessness or passive submission to the illness (Tab. 2).

The analysis shows that 43 of the 85 survey participants (50.59%) presented a high level of constructive style, 38 respondents (44.71%) presented a medium level of constructive style

TABLE 1. Level of acceptance of illness

Point range	n	Average	SD	Average per question	Median	Minimum	Maximum	Q1	Q3
8–40	85	24.89	6.37	3.11	24	13	40	20	29

SD – standard deviation; Q1 – lower quartile; Q3 – upper quartile

TABLE 2. Coping strategies of respondents (Mini-MAC)

Mini-MAC	n	Average	SD	Median	Minimum	Maximum	Q1	Q3
Anxiety preoccupation	85	17.75	4.7	17	9	28	14	21
Fighting spirit	85	22.38	3.16	23	13	28	21	24
Helplessness	85	15.42	4.32	14	7	25	12	19
Positive re-evaluation	85	22.33	2.61	22	15	28	21	24

SD – standard deviation; Q1 – lower quartile; Q3 – upper quartile

and 4 respondents (4.71%) presented a low level of constructive style. Analysing the destructive coping style showed that 37 of the 85 survey participants (43.53%) presented a low level of destructive style, 32 respondents (37.65%) presented a medium level of destructive style and 16 respondents (18.82%) presented a high level of destructive style (Tab. 3).

TABLE 3. Constructive and destructive coping style

Number of points	Interpretation	n	%
Constructive style			
14–34	low level	4	4.71
35–44	medium level	38	44.71
45–56	high level	43	50.59
Destructive style			
14–30	low level	37	43.53
31–42	medium level	32	37.65
43–56	high level	16	18.82

When analysing the data taking into account the support received according to the ISSB among the respondents, it was found that the average score on the emotional support subscale was 23.71 points, giving 2.63 points per question, so the respondents experienced this type of support once a week. In contrast, the mean score on the information support subscale was 34.36 points, giving 2.86 points per question, so respondents also experienced this type of support once a week. The average score on the instrumental support subscale was 44.73 points, which is 3.19 points per question, so respondents also experienced this type of support once a week. The mean score on the valuing support subscale was 14.05 points, giving 2.81 points per question, so respondents also experienced this type of support once a week (Tab. 4).

Coping strategies of patients with renal cell carcinoma treated surgically according to selected variables

Analysis on psychological adjustment to cancer according to the Mini-MAC according to the age of the subjects showed that the age of the patients correlates significantly ($p < 0.05$) and positively ($r > 0$) with positive re-evaluation (Tab. 5).

Analysis on psychological adjustment to cancer according to the Mini-MAC showed statistically significant differences

($p < 0.05$) for the fighting spirit variable, which was significantly higher in those with secondary education than in those with vocational education. For the other variables, no statistically significant differences were found according to the education of the subjects ($p > 0.05$) – Table 6.

Analysis on psychological adjustment to cancer according to the Mini-MAC showed no statistically significant differences ($p > 0.05$) according to gender (Tab. S1) and marital status (Tab. S2).

Coping strategies of surgically treated renal cell carcinoma patients versus disease acceptance and social suport

Data analysis showed no statistically significant correlation ($p > 0.05$) of coping strategies according to the Mini-MAC and disease acceptance according to the AIS among patients with RCC treated with surgery (Tab. S3).

Data analysis showed that helplessness according to Mini-MAC correlates significantly ($p < 0.05$) and positively ($r > 0$) with information support (Tab. 7). No statistically significant correlation ($p > 0.05$) was found for the other coping strategy variables according to Mini-MAC and social support according to ISSB.

DISCUSSION

The psychosocial functioning of patients after surgical treatment of RCC is an increasingly popular topic in the medical and psycho-oncology literature. In light of the results obtained, it is possible to place the findings within the broader context of current research on psychosocial aspects in oncology patients. The contemporary approach to the oncology patient involves not only treating the underlying disease, but also supporting the patient in their psychological, emotional and social adaptation. In this context, factors such as the level of acceptance of the disease, ways of coping with the cancer diagnosis and the extent of social support received are gaining importance. The aim of the present study was to assess the level of acceptance of the disease, coping strategies and received social support in patients after surgical treatment of kidney cancer.

Our own results indicate a moderate level of acceptance of the disease, which is in line with previous studies that indicate that patients do not always present extreme acceptance or rejection, and their attitudes are often neutral or ambivalent.

TABLE 4. Distribution of social support according to ISSB among the study group

ISSB	n	Range of values	Average	SD	Average per question	Median	Minimum	Maximum	Q1	Q3
Emotional support	85	9–45	23.71	7.26	2.63	24	9	40	18	29
Information support	85	12–60	34.36	9.22	2.86	36	14	52	27	41
Instrumental support	85	14–70	44.73	8.91	3.19	45	23	65	41	51
Valuing support	85	5–25	14.05	4.58	2.81	15	5	24	11	18

SD – standard deviation; Q1 – lower quartile; Q3 – upper quartile

TABLE 5. Psychological adjustment to cancer by Mini-MAC according to age

Mini-MAC	Age (years)
	Spearman correlation coefficient
Anxiety preoccupation	r = 0.018, p = 0.867
Fighting spirit	r = -0.045, p = 0.68
Helplessness	r = 0.071, p = 0.518
Positive re-evaluation	r = 0.22, p = 0.043*
Constructive style	r = 0.083, p = 0.452
Destructive style	r = 0.063, p = 0.57

* statistically significant relationship (p < 0.05)

The most frequently used strategy was fighting spirit and the least used was helplessness, which is also confirmed by the results of a study by Chojnacka-Szawłowska, who described the dominance of constructive strategies in cancer patients [16], and a study by Mielcarek et al. showing a variation in coping styles dependent on individual patient characteristics [17]. Similar observations appear in a study by Bergerot, where the importance of active psychological strategies in oncology was highlighted [18]. In a systematic review by Dieng et al. it was shown that psychological interventions based on social support significantly reduce distress and improve quality of life in cancer patients. The authors included 47 randomised controlled trials in their analysis, indicating that factors such as cancer type, family support and previous psychological experiences may modify the effectiveness of psychological interventions [19].

The relationship between age and positive reappraisal may reflect greater emotional maturity and the ability to reinterpret illness experiences in older patients. This observation is consistent with findings from Pasek [20] as well as Koç and Yıldız [21], who reported that age significantly influences coping strategies among oncology patients. On the other hand, the analysis of the relationship between education and the fighting spirit strategy showed that people with secondary education are more likely to use this strategy than those with vocational education. This may be due to better cognitive competence and greater access to medical information, which is supported by a study by Pankowska et al. (education versus health attitudes) [22]. Reese et al. highlight that constructive coping strategies, such as fighting spirit and positive re-evaluation, are associated with improved psychological well-being and better functioning of patients after cancer treatment.

TABLE 6. Mental adjustment to cancer according to Mini-MAC according to education of respondents

Mini-MAC	Education	n	Average	SD	Median	Min.	Max.	Q1	Q3	p
Anxiety preoccupation	basic	5	17.40	3.36	16.0	15	23	15.00	18.00	0.113
	professional	21	19.71	4.38	19.0	13	27	16.00	22.00	
	medium	44	16.95	4.76	15.5	9	28	14.00	19.00	
	higher	15	17.47	4.93	17.0	11	27	14.00	20.50	
Fighting spirit	basic – a	5	23.60	2.97	23.0	21	28	21.00	25.00	0.019* C > B
	professional – b	21	20.48	3.66	21.0	13	28	19.00	23.00	
	medium – c	44	23.20	2.64	23.0	17	28	21.00	25.00	
	higher – d	15	22.20	2.96	22.0	14	27	21.50	23.50	
Helplessness	basic	5	15.20	3.83	15.0	11	20	12.00	18.00	0.297
	professional	21	16.90	4.84	17.0	8	24	13.00	21.00	
	medium	44	15.11	3.92	14.0	7	25	12.00	18.00	
	higher	15	14.33	4.70	14.0	7	24	11.50	16.50	
Positive re-evaluation	basic	5	23.40	1.14	23.0	22	25	23.00	24.00	0.292
	professional	21	21.67	2.99	21.0	15	28	20.00	24.00	
	medium	44	22.68	2.61	23.0	16	28	21.00	25.00	
	higher	15	21.87	2.26	22.0	18	25	21.00	23.50	
Constructive style	basic	5	47.00	4.06	46.0	43	53	44.00	49.00	0.087
	professional	21	42.14	6.30	42.0	30	56	40.00	46.00	
	medium	44	45.89	4.65	45.0	38	55	42.00	49.25	
	higher	15	44.07	4.93	44.0	32	52	42.00	47.50	
Destructive style	basic	5	32.60	6.54	30.0	26	41	28.00	38.00	0.206
	professional	21	36.62	8.68	36.0	23	50	29.00	43.00	
	medium	44	32.07	8.11	31.0	18	52	26.75	34.25	
	higher	15	31.80	9.16	28.0	21	51	25.50	37.50	

p – Kruskal–Wallis test + post-hoc analysis (Dunn's test); SD – standard deviation; Q1 – lower quartile; Q3 – upper quartile
* statistically significant relationship (p < 0.05)

TABLE 7. Impact of coping strategies (Mini-MAC) on social support (ISSB) of surgically treated kidney cancer patients

ISSB	Spearman correlation coefficient
Anxiety preoccupation (points)	
Emotional support	r = −0.011, p = 0.921
Information support	r = 0.141, p = 0.199
Instrumental support	r = −0.024, p = 0.825
Valuing support	r = −0.021, p = 0.845
Fighting spirit (points)	
Emotional support	r = -0.042, p = 0.704
Information support	r = −0.087, p = 0.428
Instrumental support	r = −0.012, p = 0.913
Valuing support	r = −0.065, p = 0.556
Helplessness (points)	
Emotional support	r = 0.179, p = 0.101
Information support	r = 0.263, p = 0.015*
Instrumental support	r = 0.078, p = 0.479
Valuing support	r = 0.181, p = 0.097
Positive re-evaluation (points)	
Emotional support	r = -0.074, p = 0.502
Information support	r = −0.06, p = 0.588
Instrumental support	r = −0.035, p = 0.753
Valuing support	r = 0.029, p = 0.792
Constructive style (points)	
Emotional support	r = −0.061, p = 0.576
Information support	r = −0.069, p = 0.529
Instrumental support	r = −0.015, p = 0.892
Valuing support	r = −0.013, p = 0.904
Destructive style (points)	
Emotional support	r = 0.092, p = 0.401
Information support	r = 0.204, p = 0.061
Instrumental support	r = −0.006, p = 0.956
Valuing support	r = 0.099, p = 0.366

* statistically significant relationship (p < 0.05)

This study included patients from a variety of cancer groups, including those following treatment for breast, prostate and urinary tract cancers, reinforcing the generality of the findings and their applicability in the context of renal cancer [23]. A recent study by Matsuda et al. found that in patients with kidney cancer, problem-focused strategies – such as planning and active coping – correlated with higher quality of life, while avoidance strategies were associated with lower quality of life [24]. A study by Yıldız and Koç found that educational attainment, hope, illness-related uncertainty and self-efficacy were key predictors of psychosocial adaptation in kidney cancer patients, which corresponds with the observations of the present study [25].

Respondents declared receiving social support on a regular basis, which is in line with studies by Łuszczyńska and Kowalska [13] and Helgeson [26]. A study by Di Mattei et al. found that resilience protects kidney cancer patients from chronic stress and negative psychological effects in the long term. The study involved 130 patients with a confirmed diagnosis of kidney cancer, observed at 3 time points over 12 months. The analysis showed that higher levels of resilience at the start of treatment had a significant protective effect on depressive and anxiety symptoms [27]. Similar findings were presented in a study by Zhang et al. which indicates that high levels of residual and social support are associated with better psychosocial adaptation in patients after renal cancer surgery. In addition, fear of recurrence acted as an important mediator in this association [28].

The results of our study showed a correlation between levels of helplessness and informational support, which may suggest that individuals who struggle more with coping tend to seek additional information. Similar associations were noted by Li and Wang, who demonstrated that psychological distress increases the risk of depressive symptoms and anxiety in kidney cancer patients, while resilience and social support serve as protective factors [29].

This lack of association may reflect the multifaceted and individualized nature of psychological adaptation in oncology. Illness acceptance represents a predominantly internal, cognitive-emotional adaptation process, coping strategies – especially those measured by tools such as the Mini-MAC – tend to assess externalized, behavioral responses. Thus, both constructs may evolve independently in some patient groups. Northouse et al., in a comprehensive systematic review, support this interpretation, emphasizing that personal and contextual factors – including life circumstances, available support systems, and psychological resilience – can significantly influence patient adaptation, often leading to heterogeneous responses even among clinically similar individuals [30].

The lack of significant correlations between the level of acceptance of illness and coping strategies may be due to the multifactorial nature of adaptation processes. Similar to our own study, other publications highlight that the influence of demographic variables – such as age, education or gender – on patients' psychological adaptation does not always take a clear direction. Northouse et al. in a systematic review showed that, although some personal and environmental characteristics promote adaptation, responses to illness are highly individual in nature and should be analysed taking into account the patient's broader life context [30].

Limitations of the study

Despite the significant results obtained, several limitations of the study should be pointed out. Firstly, the study was 1-off and cross-sectional, which makes it impossible to observe changes over time and to draw causal conclusions. Secondly, only 85 patients from 1 institution were included in the study – limiting the possibility of generalising the results to the entire population of patients with renal cancer. Furthermore, the sampling was purposive and not random, which may generate selection bias. It should also be noted that the tools used were based on self-reporting, which may be subjective and risk responses in line with societal expectations. The lack of analysis of clinical medical factors (stage of disease, time since diagnosis, type of treatment) may also affect the limited interpretation of the results obtained.

Practical implications

The results of this study have important implications for clinical practice, particularly in the area of psycho-oncological care for patients following surgical treatment of RCC.

The identification of a moderate level of disease acceptance and a predominance of constructive coping strategies highlights the need to provide structured psychological support already during the early stages of treatment and recovery. Special attention should be directed toward younger patients and those with lower levels of education, as they exhibited lower use of beneficial coping strategies.

Given the moderate availability of social support reported by patients, it is advisable to implement comprehensive psycho-educational and therapeutic programmes aimed at enhancing resilience, reinforcing positive coping mechanisms, and strengthening patients' support networks.

These findings underline the urgent need to integrate psychological services within multidisciplinary oncological care teams, in order to improve adaptation, reduce distress, and promote better quality of life outcomes for patients undergoing treatment for renal cancer.

CONCLUSIONS

1. Patients after surgical treatment of RCC presented a moderate level of acceptance of the disease and most often showed a constructive coping style, especially through a fighting spirit strategy, which may indicate their active approach to treatment and recovery.

2. The age of the subjects correlated positively with positive reappraisal, which may indicate that older patients show more maturity and better mental adaptation to the disease situation.

3. Social support – both emotional, informational, instrumental and evaluative – was available to patients at a moderate level, and its frequency was assessed as occurring once a week.

4. No significant correlations were found between the level of acceptance of illness and coping strategies, but it was noted that those with higher levels of helplessness were more likely to seek informational support.

5. However, these conclusions should be interpreted with caution due to the cross-sectional design and the limited sample size of the study.

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SUPLEMENTARNY MATERIALS

TABELE S1. Psychological adjustment to cancer according to Mini-MAC by gender

Mini-MAC	Gender	n	Average	SD	Median	Min.	Max.	Q1	Q3	p
Anxiety preoccupation	woman	46	17.70	4.71	17.0	9	28	14.25	20.5	0.947
	male	39	17.82	4.75	17.0	11	27	14.00	21.0	
Fighting spirit	woman	46	22.41	3.28	22.5	13	28	21.00	24.0	0.749
	male	39	22.33	3.05	23.0	15	28	20.50	24.0	
Helplessness	woman	46	15.41	4.33	14.0	7	25	12.25	19.0	0.954
	male	39	15.44	4.36	14.0	7	23	12.50	18.0	
Positive re-evaluation	woman	46	22.20	2.60	22.5	16	28	21.00	24.0	0.603
	male	39	22.49	2.65	22.0	15	28	21.00	24.5	
Constructive style	woman	46	44.61	5.38	44.0	30	56	42.00	48.0	0.961
	male	39	44.82	5.28	45.0	30	55	41.00	49.0	
Destructive style	woman	46	33.11	8.35	31.0	21	52	28.00	37.5	0.968
	male	39	33.26	8.70	32.0	18	49	27.00	41.5	

p – Mann–Whitney test; SD – standard deviation; Q1 – lower quartile; Q3 – upper quartile

TABELE S2. Psychological adjustment to cancer according to Mini-MAC according to marital status of respondents

Mini-MAC	Marital status	n	Average	SD	Median	Min.	Max.	Q1	Q3	p
Anxiety preoccupation	miss, single	9	18.67	4.06	18.0	13	26	16.00	19.00	0.423
	married	39	17.18	4.15	16.0	11	27	14.00	19.00	
	widow, widower	24	18.83	5.08	19.0	11	28	14.00	22.00	
	divorced	13	16.85	5.89	16.0	9	27	11.00	19.00	
Fighting spirit	miss, single	9	22.56	2.92	22.0	18	28	21.00	24.00	0.354
	married	39	23.03	2.88	23.0	14	28	21.00	25.00	
	widow, widower	24	21.38	3.66	21.5	13	27	20.00	23.25	
	divorced	13	22.15	2.97	22.0	15	28	21.00	23.00	
Helplessness	miss, single	9	14.22	4.52	14.0	8	23	12.00	15.00	0.87
	married	39	15.10	4.06	14.0	7	24	13.00	17.50	
	widow, widower	24	16.08	4.96	15.5	8	25	11.75	21.00	
	divorced	13	16.00	3.85	15.0	11	23	13.00	19.00	
Positive re-evaluation	miss, single	9	21.67	2.96	21.0	18	28	20.00	22.00	0.262
	married	39	22.77	2.56	23.0	16	26	21.00	25.00	
	widow, widower	24	22.38	2.48	22.0	17	28	21.00	24.00	
	divorced	13	21.38	2.72	22.0	15	25	20.00	23.00	
Constructive style	miss, single	9	44.22	5.49	44.0	38	56	40.00	45.00	0.369
	married	39	45.79	4.94	46.0	32	54	42.00	49.00	
	widow, widower	24	43.75	5.81	43.5	30	55	41.00	47.50	
	divorced	13	43.54	5.22	44.0	30	53	42.00	46.00	
Destructive style	miss, single	9	32.89	8.19	32.0	21	49	28.00	33.00	0.862
	married	39	32.28	7.69	31.0	18	51	27.00	34.50	
	widow, widower	24	34.92	9.56	35.0	21	52	26.50	42.00	
	divorced	13	32.85	9.23	33.0	21	49	24.00	38.00	

p – Kruskal–Wallis test; SD – standard deviation; Q1 – lower quartile; Q3 – upper quartile

TABELE S3. Effect of coping strategies (Mini-MAC) on acceptance of illness (AIS) of patients with renal cell carcinoma treated with surgery

Characteristics examined	Spearman correlation coefficient	p
Anxiety preoccupation and AIS	−0.106	0.333
Fighting spirit and AIS	0.119	0.277
Helplessness and AIS	−0.107	0.329
Positive re-evaluation and the AIS	0.178	0.104
Constructive style and AIS	0.172	0.114
Destructive style and AIS	−0.106	0.332