

Family Caregivers' Burden, Patients' Resourcefulness, and Health-Related Quality of Life in Patients With Colorectal Cancer

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OBJECTIVES: To examine how family caregivers' burden and patients' resourcefulness influence each other and health-related quality of life (HRQOL) in patients with colorectal cancer.

SAMPLE & SETTING: This study was conducted in an outpatient clinic at a medical center in Taichung, Taiwan. A total of 84 patient-caregiver dyads were recruited, and 43 patients had advanced-stage cancer. Patients and their caregivers signed consent forms individually. Patients were aged 29–77 years, and caregivers were aged 22–75 years.

METHODS & VARIABLES: The theory of resourcefulness and QOL guided this study. An F test and multiple regression analyses were conducted to examine the relationships among demographic characteristics, family caregivers' burden, patients' resourcefulness, and patients' HRQOL.

RESULTS: Higher-resourcefulness patients tended to have caregivers with higher self-esteem and fewer health impacts. Caregivers with fewer impacts to health and finances and higher self-esteem were predictive of higher resourcefulness in patients. Higher patient resourcefulness, fewer caregiver disruptions to daily schedule and impacts to finances, and higher caregiver self-esteem were predictors of patients' HRQOL.

IMPLICATIONS FOR NURSING: When developing and evaluating education programs about cognitive skills training for patients with cancer, nurses should take family caregivers' burden into consideration to support optimal patient outcomes and HRQOL.

KEYWORDS health-related quality of life; resourcefulness; family caregivers' burden

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In 2022, 1.9 million new cases of colorectal cancer (CRC) were diagnosed, and 930,000 deaths from CRC occur each year worldwide (World Health Organization, 2023). CRC and cancer-related symptoms affect patients' health-related quality of life (HRQOL) (Mintiotti et al., 2022). HRQOL in patients with cancer is defined as patients' perception of their physical, psychological, functional, and social health status in the context of cancer and its treatments (Cella, 2000).

HRQOL is an important predictor for survival in patients with CRC (Park et al., 2018). Age, gender, comorbidities, and tumor locations are statistically significant predictors of HRQOL in patients with CRC (Al-Shandudi et al., 2022). QOL was also found to be affected by age (Yeo et al., 2018) and gender (Nogueira et al., 2018) in patients with breast cancer. Being unmarried, of lower income, or of lower education level, as well as receiving certain types of treatment, was significantly related to inadequate QOL in patients diagnosed with breast cancer (Ho et al., 2018).

In addition, learned resourcefulness, as defined by Meichenbaum (1977), was a significant predictor of QOL; higher resourcefulness correlated with fewer depressive symptoms in Taiwanese women diagnosed with breast cancer (Huang et al., 2010). A study by Lin et al. (2017) found a mediating effect when patients with prostate cancer with higher resourcefulness experienced better QOL and fewer depressive symptoms. Resourcefulness helps patients organize different techniques to overcome the challenges caused by the disease (Wang & Zauszniewski, 2018), as well as to maintain their independence by using personal and social resources (Wang et al., 2016).

Patients with cancer and their family caregivers often experience challenges caused by cancer and fight the illness together (Given et al., 2001). Patients and their family caregivers can be considered an entity

jointly facing challenges from cancer treatments and related side effects (Northouse et al., 2014). Family caregivers are often central to the care of patients in Taiwan with mental illness, with cancer in general, and with CRC in particular (Chen et al., 2009; Chien et al., 2007; Shieh et al., 2012).

The roles of family caregivers for patients with cancer were mainly to alleviate fatigue and pain and to improve patients' HRQOL (Silveria et al., 2011). Family caregivers of patients with cancer experience positive and negative aspects of this role. Caregivers' self-esteem is a positive role aspect. Caregivers' self-esteem is a subjective self-evaluation that enables them to value their effort in caring for patients (Kim, 2017). Strong self-esteem helps caregivers feel less stress from psychological challenges (Lim & Lee, 2010). Family caregivers with higher self-esteem felt that caregiving was less burdensome and had better overall well-being (Yang et al., 2022). Disrupted daily schedule, negative impact on health, and lack of family support are examples of negative aspects of the caregiving role and are predictors of patients' HRQOL (Daly et al., 2009).

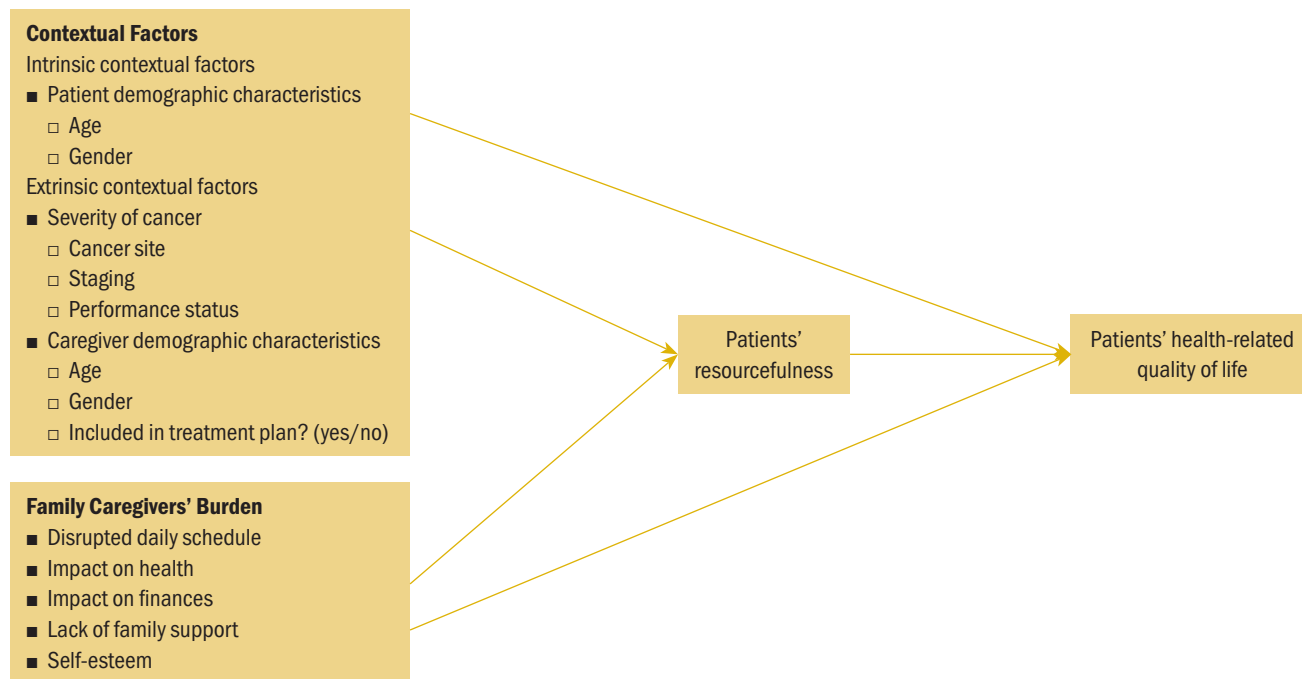
This can also be described by the term *caregivers' burden*, which refers to the subjective feelings caused by the physical, emotional, psychological, social,

and financial impacts of providing care (Given et al., 1992). Of note, family caregivers of patients with poorer HRQOL and of patients with advanced-stage lung cancer experienced heavier caregivers' burden than family caregivers of patients with higher HRQOL and with early-stage disease, respectively (Borges et al., 2017). Caregivers' burden can also be heavier when patients experience more severe sleep disturbance (Johansen et al., 2018).

In summary, the literature indicates that higher resourcefulness may reduce depressive symptoms and improve HRQOL in patients with cancer, although the evidence is limited. There may be a mutually influential relationship between patients' HRQOL and family caregivers' burden. When nurses provide patients with cancer-related educational materials, family caregivers simultaneously receive the same information. The literature has not yet established whether or in what manner family caregivers' burden relates to patients' resourcefulness or patients' HRQOL.

This preliminary study aimed to understand the influence of family caregivers' burden on patients' resourcefulness and HRQOL. Family caregivers' burden consisted of positive (self-esteem) and negative influences (disrupted daily schedule, impact on health, impact on finances, and lack of family

FIGURE 1. Conceptual Framework



support) (Given et al., 1992). Figure 1 presents the framework for this study. The study recruited dyads consisting of patients with CRC and their family caregivers and sought to identify whether family caregivers' burden influenced patients' resourcefulness and HRQOL, with the goal of establishing an effective measure to improve patients' HRQOL. According to this purpose, the following research questions were generated:

- Were there any differences in family caregivers' burden between patients with higher resourcefulness and patients with lower resourcefulness?
- How can family caregivers' burden explain patients' resourcefulness?
- What is the individual influence of patients' resourcefulness and caregivers' burden on patients' HRQOL, controlling for demographic and clinical characteristics?

Conceptual Framework

The concept of learned resourcefulness, which consists of self-monitoring, problem-solving, and regulation/self-control (Meichenbaum, 1977), is particularly relevant in the fields of nursing and health care (Zauszniewski, 2016; Zauszniewski et al., 2006, 2012). Learned resourcefulness consists of a set of formal and informal cognitive behavioral skills that can help patients cope with challenges of battling illness. Resourcefulness may relate to patients' QOL (Zauszniewski, 2016).

The theory of resourcefulness and QOL guided this study. It highlights the importance of adaptive coping strategies and using intrinsic and extrinsic resources to improve patients' ability to manage the experience of their illness with the goal of improving their QOL (Zauszniewski, 2016). The theory incorporates the following four concepts: antecedent contextual factors, process regulators, resourcefulness, and QOL (Zauszniewski, 2016).

This framework emphasizes that individuals learn by interacting with their environment (Rosenbaum, 1990). The antecedent contextual factors consist of intrinsic (e.g., demographic characteristics) and extrinsic factors (e.g., family context) (Zauszniewski et al., 2012). Empirical evidence has supported that intrinsic contextual factors relating to resourcefulness in patients with cancer include gender, education level, and comorbidities (Au et al., 2012; Brewin et al., 1996; Goff, 2011). Extrinsic contextual factors supported by the literature in patients with cancer are social support and social network (Huang & Guo, 2009).

In the context of health care, nurses provide patients with disease-related educational materials to improve their resourcefulness by equipping them with knowledge so that they have a better understanding of their conditions and can develop strategies for disease management, which can thereby improve their HRQOL.

TABLE 1. Sample Characteristics (N = 168)

Characteristic	Patients (N = 84)		Caregivers (N = 84)	
	n	%	n	%
Gender				
Male	53	63	25	30
Female	31	37	58	69
No data	-	-	1	1
Education level				
Elementary	18	21	7	8
Junior high	12	14	11	13
Senior high	31	37	31	37
College	16	19	26	31
Graduate	4	5	5	6
Other	3	4	4	5
Employment				
Retired	29	35	10	12
Full-time	26	31	36	43
Housekeeper	13	15	26	31
On leave	3	4	1	1
Part-time	2	2	7	8
Other	11	13	4	5
Monthly income (NT\$)				
Less than 35,000	22	26	17	20
35,000-59,999	23	27	25	30
60,000-89,999	14	17	19	23
90,000-120,000	12	14	9	11
More than 120,000	8	10	7	8
Missing data	5	6	7	8
Chronic disease				
No	55	65	66	79
Yes	29	35	17	20
Missing data	-	-	1	1
Diagnosis				
Colon cancer	53	63	-	-
Rectal cancer	23	27	-	-
Other	8	10	-	-

NT\$—New Taiwan dollars

TABLE 2. Sample Scores on Caregivers' Burden, Patients' Resourcefulness, and HRQOL (N = 168)

Characteristic	Patients (N = 84)			Caregivers (N = 84)		
	\bar{X}	SD	Range	\bar{X}	SD	Range
Caregivers' burden						
Disrupted daily schedule	-	-	-	2.83	0.72	1-4.6
Impact on finances	-	-	-	2.5	0.91	1-5
Impact on health	-	-	-	1.5	0.52	1.05-2.25
Lack of family support	-	-	-	1.91	0.64	1-3.24
Self-esteem	-	-	-	4.14	0.58	2.86-5
Patients' HRQOL						
Total score	71	17.24	26-102	-	-	-
Patients' resourcefulness						
Personal	55.1	12.95	12-80	-	-	-
Social	39.24	9.58	20-80	-	-	-
Total	94.34	20.48	37-140	-	-	-

HRQOL—health-related quality of life

Note. Caregivers' burden was measured using the Caregiver Reaction Assessment, a 5-point, 24-item Likert-type scale measuring caregivers' perceived competence at caring for a family member, with responses scored from 1 to 5, with higher scores indicating less burden. HRQOL was measured using the Functional Assessment of Cancer Therapy-General, a 5-point, 28-item Likert-type scale with responses scored from 0 to 4, with higher scores indicating better HRQOL. Patients' resourcefulness was measured using the Chinese-language version of the Resourcefulness Scale, a 6-point, 28-item Likert-type scale with responses scored from 0 to 5, with higher scores indicating greater resourcefulness.

Methods

Sample and Setting

A total of 84 patient-caregiver dyads were recruited from May to October 2018. Sample size was calculated using G*Power, version 3.1.9.3. Assuming alpha of 0.05 (type I error), power of 0.8, and effect size of 0.15 (medium), using an F test, multiple regression analysis, and R^2 increase, the required sample size for statistical significance was calculated to be 92. However, this study recruited fewer patient-caregiver dyads than this power analysis suggested. Post hoc analysis based on a sample size of 84, six predictors, alpha of 0.05, and effect size of 0.18 (calculated using a square multiple correlation coefficient of 0.155) yielded a power of 0.81 with G*Power, version 3.9.1.3. The results of this study were robust.

After approval from the China Medical University and Hospital Research Ethics Center Institutional Review Board (CMUH107-REC-3-056), this study took place in an outpatient CRC clinic at the China Medical University and Hospital in Taichung, Taiwan. The inclusion criteria for patients were having CRC, being aged 21 years or older, and being able to speak Mandarin or Taiwanese. The exclusion criteria for patients were being unable to communicate or having another type of cancer. Patients with cancer at other

sites that spread to colorectal sites were also excluded from this study. The inclusion criterion for family caregivers was being the primary caregiver for an individual who met the patient inclusion criteria. The exclusion criterion for caregivers was being hired by the families of the patients. Patients and their family caregivers were required to provide consent simultaneously to participate in the study. If the patient or the family caregiver in a dyad declined to participate, both were excluded from the study.

Researchers identified eligible patients at the CRC clinic. They began by explaining the research process to the patients and inviting them to participate in the study. If a family caregiver accompanied a patient to a clinic visit, the caregiver was separately informed about the study and was invited to participate. If the family caregiver was not with the patient, the patient was asked to convey the information to the caregiver, and an in-person appointment was scheduled to explain the study to the caregiver.

The researcher gave the participants self-report written questionnaires. After the participants filled out the questionnaires, they returned them to the researcher on the same day or when they came back to the hospital for cancer treatment. The estimated time to complete the questionnaires was 15–20 minutes for

patients and 10 minutes for family caregivers. All data were anonymized, numbered, and stored in a locked cabinet that only researchers could access. The data were analyzed as a group, and no personal information was in any of the reports.

Variables and Instruments

Patient-caregiver characteristics: Demographic and clinical characteristics of patients were age, gender, education level, income, occupation, comorbidities, diagnosis, and severity of disease. Severity of disease was measured using the Eastern Cooperative Oncology Group Performance Status scale. This scale was established in 1955 to assess patients' performance status (ECOG-ACRIN Cancer Research Group, 2022). Scores on the performance status scale range from 0 (fully active) to 5 (dead) (ECOG-ACRIN Cancer Research Group, 2022). Demographic characteristics of patients' family caregivers were age, gender, education level, relationship with the patient, presence of chronic disease, and whether they were included by care providers in decision-making and discussions about the treatment plan.

Caregivers' burden: Caregivers' burden was measured using the Caregiver Reaction Assessment (CRA). The CRA is a five-point, 24-item Likert-type scale measuring caregivers' perceived competence at caring for a family member, with responses ranging from 1 (totally disagree) to 5 (totally agree) and five subscales. The self-esteem subscale measures the extent to which the caregiver perceives taking care of sick family members as having a positive impact. The other four subscales measure the extent to which impact on health, disrupted daily schedule, lack of family support, and impact on finances are perceived to negatively affect the caregiver. This scale was developed and assessed among caregivers of patients with cancer and patients with Alzheimer disease. Cronbach's alpha for each subscale is 0.82 (disrupted daily schedule), 0.9 (self-esteem), 0.85 (lack of family support), 0.8 (impact on health), and 0.81 (impact on finances) (Given et al., 1992). Confirmatory factor analysis showed strong construct validity for the CRA (Given et al., 1992). The CRA has been translated into many languages, including traditional Chinese. It was used in a longitudinal study to investigate caregivers' burden for family caregivers of patients with head and neck cancer in the United States (Balkaran et al., 2021) and family caregivers of patients with oral cancer in Taiwan (Chang et al., 2023).

Patients' resourcefulness: Patients' resourcefulness was measured using the Chinese version of the Resourcefulness Scale (C-RS). The Resourcefulness

Scale has been widely used to assess resourcefulness, including in a training program for grandmothers who raised grandchildren (Zauszniewski et al., 2012), as well as in studies examining health-seeking behavior and sexuality in rectal cancer survivors (Au et al., 2012), resourcefulness in preadolescents (Wang & Zauszniewski, 2018), the role of a resourcefulness intervention on depressive symptoms and life satisfaction in postpartum Arab women (Badr et al., 2021), and the relationship between resourcefulness and positive thinking in hospice and palliative care nurses (Gergis et al., 2023).

The C-RS is a six-point, 28-item Likert-type scale with responses ranging from 0 (not descriptive) to 5 (extremely descriptive), with higher scores indicating greater resourcefulness. The C-RS contains two subscales: personal resourcefulness and social resourcefulness. The original scale was developed and assessed in more than 200 older adults, with Cronbach's alpha of 0.88, and confirmatory factor analysis showed good construct validity (Zauszniewski et al., 2006). The C-RS was evaluated in 100 patients with CRC, with a Cronbach's alpha of 0.88 (overall scale), 0.87 (personal resourcefulness), and 0.77 (social resourcefulness) (Au et al., 2012).

TABLE 3. F Test for Comparison of Caregivers' Burden With Lower- and Higher-Resourcefulness Patients (N = 84)

CRA Factor	Lower Resourcefulness (N = 42)		Higher Resourcefulness (N = 42)		F
	\bar{X}	SD	\bar{X}	SD	
Disrupted daily schedule	2.78	0.75	2.87	0.71	0.6
Impact on finances	2.55	1.09	2.44	0.7	-0.52
Impact on health	1.07	0.51	1.32	0.51	2.09*
Lack of family support	1.87	0.59	1.95	0.69	0.56
Self-esteem	4.3	0.54	4	0.57	-2.59*

*p < 0.05

CRA—Caregiver Reaction Assessment

Note. Caregivers' burden was measured using the CRA, a 5-point, 24-item Likert-type scale measuring caregivers' perceived competence at caring for a family member, with responses scored from 1 to 5, with higher scores indicating less burden.

TABLE 4. Hierarchical Linear Regression for Effects of Caregivers' Burden and Patients' Resourcefulness on HRQOL

Model	R ²			
	R ²	Change	SE	F
Model 1: demographic characteristics only	0.04	0.04	18	0.59
Model 2: Add family caregivers' burden.	0.3	0.26**	15	1.96*
Model 3: Add patients' resourcefulness.	0.58	0.28**	13.3	6.46**

* $p < 0.05$; ** $p < 0.001$

HRQOL—health-related quality of life; SE—standard error

Note. The parameters of the variance inflation factor (1–2.64) in the regression indicated no multicollinearity.

HRQOL: HRQOL was measured using the Chinese version of the Functional Assessment of Cancer Therapy–General (FACT-G). The FACT-G was developed in 1993 after item crafting and validating in a focus group of patients with cancer who received cancer treatments, and it has been widely used to measure QOL in patients with cancer during treatment (Cella et al., 1993). A study to examine the effectiveness of yoga on improving the QOL in patients with prostate cancer used the FACT-G to measure HRQOL (Kaushik et al., 2022).

The Chinese version of the FACT-G is a five-point, 28-item Likert-type scale with scores for each item ranging from 0 (not at all) to 4 (very much). Total scores range from 0 to 112, with higher scores indicating better QOL. This scale consists of the following four subscales: physical well-being (7 items), emotional well-being (6 items), social well-being (7 items), and functional well-being (7 items). The scale and subscales have good reliability and validity. Cronbach's alpha for the FACT-G total score is 0.92 and ranges from 0.82 to 0.88 for subscales (Cella et al., 1993).

Data Analyses

All data were first entered in IBM SPSS Statistics, version 25.0, then were cleaned. Descriptive statistics were used for the demographic and key study variables. Parametric data were presented using means and SDs, and nonparametric data were presented using frequencies and percentages. The significance level was set at an alpha of 0.05.

To examine the effect of patients' resourcefulness on caregivers' burden, patient–caregiver dyads were separated into two groups using dummy coding.

Dyads with patients who scored in the 50th percentile and above on the C-RS were defined as having higher resourcefulness, and dyads with patients who scored below the 50th percentile on the C-RS were defined as having lower resourcefulness. Each group had 42 dyads. To prevent type I errors caused by using multiple independent t tests, an F test was used to examine the differences between these two groups in the factors measured by the CRA.

Regression analyses were used to assess the influence of caregivers' burden on patients' resourcefulness and the influence of caregivers' burden and patients' resourcefulness on patients' HRQOL. The influence of caregivers' burden on patients' resourcefulness was assessed using a multiple regression analysis. The dependent variable was patients' resourcefulness, and the independent variables were patients' and caregivers' demographic and clinical characteristics and caregivers' burden. To assess the influence of caregivers' burden and patients' resourcefulness on patients' HRQOL, hierarchical multiple regression analysis was used. The dependent variable was patients' HRQOL, measured as the total score on the FACT-G. Three sets of independent variables were used. The first consisted of the patients' and caregivers' demographic and clinical characteristics. The second was caregivers' burden, measured as the five subscale scores on the CRA. The third was patients' resourcefulness, measured by the score on the C-RS. If both multiple regression analyses were identified to be significant models, the mediating and moderating effects would be examined (Hayes, 2017) using the PROCESS macro in IBM SPSS Statistics, version 25.0.

Results

Patient–Caregiver Characteristics

The sample consisted of 84 patient–caregiver dyads. See Table 1 for demographic and clinical characteristics. Patients were aged an average of 57.8 years (SD = 11, range = 29–77), 53 (63%) were male, 53 (63%) had colon cancer, 43 (51%) had metastatic colon cancer, 20 (24%) had at least a college degree, 28 (33%) had a full-time or part-time job, and 45 (53%) reported a monthly household income of 59,999 New Taiwan dollars or less. A household income of 60,000 New Taiwan dollars is considered well-off for a family in Taiwan.

Caregivers were aged an average of 50 years (SD = 12, range = 22–75). The average time spent caring for a patient during hospitalization was 15 hours (SD = 5.95). Fifty-eight (69%) family caregivers were female, 58 (69%) were patients' spouses, 43 (51%) had full-time

or part-time jobs, 42 (50%) reported a monthly household income of 59,999 New Taiwan dollars or less, and 66 (79%) reported no chronic disease. See Table 2 for scores on caregivers' burden, patients' resourcefulness, and HRQOL.

Patients' Resourcefulness Affecting Caregivers' Burden

The results of the F test (one-way analysis of variance) to find differences in family caregivers' burden between patients with higher and lower resourcefulness indicated that two factors measured by the CRA differed between the higher- and lower-resourcefulness groups. Family caregivers of patients with higher resourcefulness experienced a greater positive impact on self-esteem ($p < 0.05$) and lesser negative impact to their health ($p < 0.05$) (see Table 3).

Caregivers' Burden Affecting Patients' Resourcefulness

Employing the clinical and demographic characteristics of patients and caregivers, as well as caregivers' burden, in a multiple regression analysis to find their effects on patients' resourcefulness indicated that about 32% of the variance in patients' resourcefulness ($p < 0.05$) could be explained by the following three predictors: impact on caregivers' health ($\beta = -0.37, p < 0.05$), caregivers' self-esteem ($\beta = 0.35, p < 0.05$), and impact on caregivers' finances ($\beta = -0.29, p < 0.05$).

Patients' Resourcefulness and Caregivers' Burden Affecting Patients' HRQOL

Hierarchical multiple regression analysis indicated that about 58% of the variance in patients' HRQOL could be explained by patients' resourcefulness and caregivers' burden ($p < 0.001$). The demographic and clinical characteristics of patients and family caregivers were not statistically significant. Family caregivers' burden and patients' resourcefulness significantly contributed 26% and 28% variance, respectively, to patients' HRQOL (see Table 4). Four statistically significant predictors of patients' HRQOL were identified in the models. From strongest to weakest, they were patients' resourcefulness ($\beta = 0.64, p < 0.001$), caregivers' disrupted daily schedule ($\beta = -0.35, p < 0.001$), caregivers' self-esteem ($\beta = 0.33, p < 0.05$), and impact on caregivers' finances ($\beta = -0.23, p < 0.05$) (see Table 5). Patients' resourcefulness and caregivers' self-esteem had a positive impact on patients' HRQOL, and the other caregivers' burden-related factors had a negative impact on patients' HRQOL. In addition, moderating and mediating effects were

KNOWLEDGE TRANSLATION

- Patients' health-related quality of life (HRQOL) is significantly affected by caregivers' burden.
 - Caregivers' self-esteem has a significant positive impact on patient resourcefulness and HRQOL.
 - Poor health in caregivers resulting from patient care demands has a negative impact on patient resourcefulness and HRQOL.
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analyzed following the recommendations from Hayes (2017). The results found neither direct mediating effects nor direct moderating effects.

Discussion

This study aimed to explore the relationships among family caregivers' burden, patients' resourcefulness, and patients' HRQOL. Previous empirical evidence has examined factors contributing to caregivers' burden and its negative impact on family caregivers' QOL (Shin et al., 2018; Thana et al., 2021). Results of this study have added empirical evidence about how caregivers' burden contributes to patients' resourcefulness and HRQOL during cancer care.

Family caregivers of patients with higher resourcefulness had higher self-esteem. Patients with higher resourcefulness may have more effective strategies for managing the disease and may be better at communicating care needs. This could contribute to lessening the impact of patient care on caregivers' health and enhancing caregivers' self-esteem. Additional research about this phenomenon is recommended.

Results from the multiple regression analyses indicated that caregivers' self-esteem has a positive influence on patients' resourcefulness and HRQOL. Caregivers' self-esteem, as a psychological indicator of caregivers' burden, may be related to having a positive attitude when caring for a family member with cancer. When a patient-caregiver dyad faces challenges during cancer treatment, the way they respond to these challenges may be related to family dynamics. If a caregiver comes from a family with a dynamic of mutual support, they might perceive caring for family member patients as a collaborative relationship in which the whole family copes with the disease together (Jeong et al., 2016). Conversely, a study by Preechawong et al. (2007) did not find self-esteem to be associated with patients' resourcefulness.

Family caregivers of patients with higher resourcefulness experienced less impact on their health than caregivers of patients with lower resourcefulness. In

TABLE 5. Predictors of the Hierarchical Linear Model

Variable	UC	SE	SC
Demographic			
Caregiver age (years)	0.19	0.13	0.14
Caregiver gender (male)	-3.9	3.7	0.11
Caregiver included in treatment plan (yes)	4.7	5.2	0.09
Patient age (years)	0.18	0.16	0.11
Patient gender (male)	-3.9	3.7	-0.11
Cancer severity			
Cancer site	18	21	7
Cancer stage	12	14	11
Performance status	31	37	31
Caregivers' burden			
Disrupted daily schedule	-1.7	0.35	-0.35**
Impact on finances	-1.4	0.69	-0.23*
Impact on health	1.05	1.08	0.13
Lack of family support	-0.83	0.75	-0.15
Self-esteem	1.4	0.6	0.33*
Patients' resourcefulness			
Total score	0.52	0.09	0.64**
*p < 0.05; **p < 0.001 SC—standardized coefficient; SE—standard error; UC—unstandardized coefficient			

addition, greater negative impact to health among family caregivers was associated with lower resourcefulness and HRQOL in patients in this study. Caring for family members often causes caregivers to experience physical symptoms, most commonly pain and fatigue (Lee et al., 2018). This could create a negative feedback loop, resulting in patients and family caregivers experiencing more severe physical discomfort during the trajectory of cancer treatment.

Disrupted daily schedule was the most severe burden experienced by caregivers over time, according to some studies (Lee et al., 2018; Milbury et al., 2013). Patients' care needs vary, and family caregivers must adjust their schedules to provide care. This study also found a negative relationship between disrupted daily schedule and patients' HRQOL, which echoed the findings of Daly et al. (2009).

Limitations

This study included only patient-caregiver dyads that contained patients with CRC being treated at an outpatient clinic. The results may not apply to inpatients with CRC nor patients with other cancer diagnoses.

Additional research is needed. There is no empirical evidence from this study that indicates the potential for mediating effects because of its smaller sample size. Conducting a study with a larger sample size to examine direct and indirect mediating effects of patients' resourcefulness on the relationship between patients' HRQOL and family caregivers' burden is needed and recommended.

Implications for Nursing

When developing and evaluating education programs about skills training for patients with cancer, nurses should take family caregivers' burden into consideration to support optimal patient outcomes. For example, strategies to enhance caregivers' self-esteem from providing care to patients and to alleviate the impact on caregivers' health from caregiving demands can benefit patients' resourcefulness and HRQOL. In addition, strategies to minimize disruptions to caregivers' daily schedules can benefit patients' HRQOL.

Conclusion

Family caregivers' burden profoundly affects patients' resourcefulness and HRQOL. It is recommended to educate patients about strategies for disease management to lessen family caregivers' burden and achieve optimal health outcomes. Additional study is recommended.

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Both authors contributed to the conceptualization and design, completed the data collection, provided statistical support and the analysis, and contributed to the manuscript preparation.

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