# **RESEARCH ARTICLE**

# The Influencing Factors of Family Function, Social Support and Impact on Quality of Life in Patients with Gastrointestinal Cancer

# Lu Xin<sup>1,2</sup>, Jaruwan Viroj<sup>1</sup>, Sumattana Glangkarn<sup>1\*</sup>

### Abstract

Background: Reduced quality of life is a common problem faced by gastrointestinal cancer patients, but the problems of family dysfunction and social support that they also need to face are scarcely explored. Moreover, the influencing factors of family function, social support and impact on quality of life in patients with gastrointestinal cancer has yet to be explored. **Objective:** To explore the influencing factors of family function, social support and impact on quality of life in patients with gastrointestinal cancer. Methods: This study was a cross-sectional study with a simple random sampling. A total of 399 gastrointestinal cancer patients from one tertiary hospital were recruited to participate in this study. The quality of life questionnaire-core 30 (QLQ-30), family caring scale(APGAR) and social support rating scale(SSRS)were used to assess patients' quality of life, family function and social support. We performed descriptive analysis and logistic regression analysis to probe the influencing factors of family function, social support and impact on quality of life in patients with gastrointestinal cancer. Results: About half of the participants (46.12%) had a low social support score, age, income level and stage of cancer were the influencing factors for the occurrence of social support disorder(P<0.05). More than halfof the participants(51.38%) had family dysfunction, age, marital status and stage of cancer were the influencing factors for family dysfunction(P<0.05). Participants with insufficient social support and family dysfunction had lower quality of life scores(P<0.05). Family function and objective support were the factors affecting the quality of life of gastrointestinal cancer patients (P<0.05). Conclusions: Family function and social support can affect the quality of life of patients with gastrointestinal cancer. The effects of family function and social support should be considered comprehensively to improve the quality of life of patients with gastrointestinal cancer.

Keywords: Gastrointestinal neoplasms- Quality of life- Familyfunction- Social support

Asian Pac J Cancer Prev, 26 (6), 2137-2144

## Introduction

Gastrointestinal cancer encompasses malignancies of the digestive system, with the five principal types being esophageal carcinoma (EC), gastric adenocarcinoma (GC), colorectal cancer (CRC), pancreatic ductal adenocarcinoma (PDAC), and hepatocellular carcinoma (HCC) based on WHO histological classification [1]." Gastrointestinal cancers, including liver, esophageal and stomach cancers, contribute to a significant cancer burden in China, with 1.21 million new cases diagnosed in 2020, accounting for two-thirds of the global total [2].

Gastrointestinal cancer has a high incidence and relatively high mortality due to poor prognosis and advanced manifestations [3]. According to GLOBOCAN 2020 data, gastrointestinal cancers accounted for 45% of global cancer mortality in the referenced year [3]. Poor prognosis, treatment-related side effects and burden often lead to negative emotions and reduced quality of life (QoL; defined by the World Health Organization as 'an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns') in patients with gastrointestinal cancer [4]. Given the high incidence and mortality of gastrointestinal cancer worldwide, the management of patients with gastrointestinal cancer should be a priority [5].

Patients with gastrointestinal cancer often exhibit reduced quality of life, including anxiety and depression due to physical discomfort, loss of control, altered self-image, fear of losing independence, and death [6, 7]. Relevant studies have confirmed that psychological distress in patients with gastrointestinal cancer is related to increased physical symptoms and decreased quality of life, which may become an obstacle for patients to participate in survival nursing [8]. But the factors that

<sup>1</sup>Faculty of Public Health, Mahasarakham University, Ban Tha Khon Yang, Kantra Vichai, Thailand. <sup>2</sup>Gastrointestinal Surgery, The First Affiliated Hospital, College of Clinical Medicine, Henan University of Science and Technology, Luoyang 471003, Henan Province, China. \*For Correspondence: sumattana.g@msu.ac.th

#### Lu Xin et al

contribute to the reduced quality of life in patients with gastrointestinal cancer may not only be due to the condition and psychological distress.Because of reduced social activity in patients with gastrointestinal cancer, it is unknown whether changes in their social support affect patients' quality of life. In addition, familial support may influence the quality of life in individuals diagnosed with gastrointestinal (GI) malignancies, for example, Lee reported that family function can affect the diet of patients with GI malignancies [9].

To clarify the influencing factors of family function and social support and their effects on quality of life is helpful for the implementation of intervention in patients with gastrointestinal cancer. However, it is unclear whether there is a correlation between family function, social support and quality of life, and relevant studies are lacking. Gastrointestinal cancer tends to occur in middleaged and elderly people. In China, the vast majority of elderly people live with their children, who provide support services instead of nursing institutions. If social support and family function have an impact on the quality of life of patients with gastrointestinal cancer, then their role may be greater in China. But we have seen no reports from Chinese scholars.

In light of the aforementioned research gaps, this study aimed to explore the influencing factors of psychological distress, family function, social support and impact on quality of life in patients with gastrointestinal cancer. We investigated the quality of life, family function and social support in patients with gastrointestinal cancer, analyzed and examine their influencing factors and their correlation. We hypothesized that family function and social support may influence the quality of life of patients with gastrointestinal cancer.

#### **Materials and Methods**

A descriptive, correlational cross-sectional study was conducted. This study was approved by the Institutional Review Board at Mahasarakham University and The First Affiliated Hospital of Henan University of Science and Technology, and conducted in accordance with the Declaration of Helsinki.

#### Participants

This study was a cross-sectional design of 399 in-patients with gastrointestinal cancers in the departments of gastrointestinal surgery in The First Affiliated Hospital of Henan University of Science and Technology (a tertiary hospital) in Luoyang, Henan Province. Patients diagnosed with gastric or colorectal cancers, informed of their illness, aged 18 or older, and able to read and write Chinese were recruited. Patients with metastatic gastrointestinal cancers, mental disorders and severe organic diseases were excluded. Necessary explanations were made to participants after obtaining informed consent.

### Measures

Socio-demographic and clinical characteristics A structured information questionnaire was used to measure participants' socio-demographic characteristics (i.e.age, gender, education level, marital status, occupation, monthly income), clinical characteristics (stage of cancer) and self-assessment quality of life(with a full score of 100 points, higher scores indicate higher levels of quality of life).

#### Quality of life

QLQ-C30 is a common scale used to assess quality of life in cancer patients. It was developed by the European Organization for Research and Treatment of Cancer (EORTC) and is widely used to assess patients' quality of life during cancer treatment. The scale consists of 30 items, including five dimensions: physical function, role function, emotional function, cognitive function and social function. Entries 1 to 28 are divided into four grades of 1-4, the higher the score obtained, the more serious the level of quality of life. Entries 29 and 30 are divided into seven grades of 1-7, the higher the score obtained, the better of quality of life. The Cronbach's  $\alpha$  of the quality of life questionnaire was 0.87.

#### Family function

The APGAR Family Functioning Assessment Form is a commonly used home assessment tool to assess the functional status of a family. The scale consists of five items with fitness, cooperation, growth, emotion and intimacy. The questionnaire mainly evaluates individuals' subjective feelings on the overall function of the family, and is applicable to the respondents above the age of teenagers. Each question has three items: almost rarely (0 points), sometimes (1 points) and often (2 points). The total score of 7-10 was classified as good family function, 4-6 as moderate family function disorder, and 0-3 as severe family function disorder. The Cronbach's  $\alpha$  of the family function questionnairewas 0.86.

#### Social support

Social Support Rating Scale (SSRS) is a commonly used scale to assess social support in China. The scale was designed by Chinese scholar Xiao Shuiyuan [10]. The scale has 10 items, which are used to measure the social relations of individuals, which 4 items of subjective support, 3 items of objective support, and 3 items of support utilization. The total score of social support is the sum of the scores of 10 items, the minimum score is 12 points, the full score is 66 points, the higher the score lower 30 indicates low social support. The Cronbach's  $\alpha$  of the social support question naire was 0.82.

#### Data collection

All data were obtained by questionnaire. The data was collected by research assistants, who hadreceived training on how to collect data using questionnaires. The research assistants approached the eligible participantsand invited them to participate in this study a weekafter their admission. Once the participantsprovided their consent to participate, they independentlycompleted the questionnaires. In case of any inquiriesor doubts about the questionnaire items, the research assistantswere available to provide explanations and assistance. *Data analysis* 

Data analysis was performed using SPSS software version 23.0. Socio-demographic and clinical characteristics were compared using Student's t-test or one-way Analysis of Variance (ANOVA) as appropriate. To explore the association between socio-demographic and clinical characteristics with family function and social support, unconditional logistic regression analyses were applied. In these logistic regression models, patients with family dysfunction or insufficient social support were considered as "cases", while those without these issues were considered as "controls". All variables that showed a significant association (p < 0.05) with family function or social support in the univariate analysis were included in the regression models. The results of the logistic regression analyses were reported in the standard manner, with odds ratios (OR) and their corresponding 95% confidence intervals (CI) provided. For the association between family function, social support, and their impact on quality of life, unconditional logistic regression analyses were also conducted, with similar reporting of OR and CI. P-values below 0.05 were regarded as statistically significant.

# Results

#### Participant Characteristics

A total of 399 participants completed the entire study protocol. The demographic and clinical characteristics of the participants are summarized in Table 1. Briefly, the mean age was 62.46 years (SD=6.52; range: 26–87

Table 1. Participant Characteristics (N=399)

Category	Value
Age (years)	62.46 ± 6.52 (Range: 26–87)
Male	59.40% (237/399)
Married	87.22% (348/399)
Employment status	
Self-employed/Unemployed	48.37% (193/399)
Education level	
Senior high school	67.67% (270/399)
Monthly income (CNY)	¥3,000–5,000 (49.87%, 199/399)
Self-rated health status	
Very poor	54.14% (216/399)
Clinical stage	
Stage III	64.41% (257/399)

years), with a majority being male (59.40%, 237/399), married (87.22%, 348/399), and having a senior high school education (67.67%, 270/399). Clinically, 64.41% (257/399) were diagnosed at Stage III (Table 1).

#### Family function and its influencing factors

The average APGAR score was 7.14 (SD=2.42) among the 399 participants, with 51.38% (205/399) scoring 6 or lower. Univariate analyses revealed significant differences in APGAR scores across age groups, monthly income levels, marital status, self-rated health status, and cancer stage (all p<0.05) (Table 2).

With family function as the dependent variable, and age, education level, monthly income, marital status, selfrated health status and disease degree were independent

Table 2. Univariate Analyses of Factors Influencing Family Function

Socio-demographic characteristics		APGAR (M±SD)	p-value
Gender	Male(n=237)	7.11±2.22	0.8678
	Female(n=162)	7.07±2.54	
Age	<60(n=138)	7.56±3.13	0.0045
	≥60(n=261)	6.73+2.53	
Occupation	Civil servant, teacher or doctor (n=52)	7.16+3.79	0.9734
	Private employed (n=154)	7.12+2.46	
	Self-employed or unemployed (n=193)	7.07+2.74	
Educational level	Junior high schoolor lower (n=54)	6.53+3.52	0.1626
	Senior high school(n=270)	7.15+2.71	
	Collegeor above (n=75)	7.52+3.13	
Income level	< ¥ 3000 (n=94)	6.33+4.05	0.0178
	¥3000-¥5000 (n=199)	7.24+2.37	
	> ¥ 5000 (n=106)	7.41+2.66	
Marital status	Unmarried/divorced/widowed (n=51)	6.53+4.24	0.0204
	Married (n=348)	7.35+1.93	
Self-assessment of health status	Good (n=27)	7.57+2.24	0.0038
	Moderate(n=156)	7.16+1.82	
	Bad (n=216)	6.64+1.75	
Stage of cancer	Stage II (n=42)	7.42+2.43	0.026
	Stage III (n=257)	7.11+2.11	
	Stage IV (n=100)	6.33+3.94	

Asian Pacific Journal of Cancer Prevention, Vol 26 2139

Lu Xin et al

Table 3. Logistic Regression analysis of factors influencing family function

Variables	Partial regression coefficient	SE	Р	OR (95%CI)
Age	0.932	0.286	0.001	2.540 (1.449-4.450)
Marital status	0.451	0.16	0.005	1.570 (1.147-2.149)
Stage of cancer	0.931	0.285	0.001	2.512 (1.436-4.433)
Constant	-1.934	0.638	0.002	0.145

variables. Unconditional logistic regression analysis was conducted, and the results showed that age, marital status and stage of cancer were influential factors for the occurrence of family dysfunction (Table 3).

### Social support and its influencing factors

The objective support score of social support in 399 participants was 7.24(SD=2.41), the subjective support score was 19.44(SD=4.52), the utilization score of support was 6.44(SD=1.85), social support score

Table 4	Univariate	Analyses	of Factors	Influencing	Social	Support
Tuble 4.	Omvariate	1 mai y 505	011 actors	muchenic	Dooral	Support

Socio-demographic characteristics		Objective	Subjective	Utilization	Social
		support	support	of support	support score
Gender	Male (n=237)	7.24±3.44	21.58±5.26	5.53±1.83	34.35±8.39
	Female (n=162)	6.93±4.04	21.44±5.93	$5.34 \pm 1.82$	33.71±9.93
	Р	0.425	0.0131	0.0084	0.4881
Age	<60 (n=138)	$7.82 \pm 3.33$	$22.24 \pm 5.09$	$5.38 \pm 1.73$	35.44±8.12
	≥60 (n=261)	6.67±3.71	$20.46{\pm}5.61$	$5.44{\pm}1.92$	32.57±9.15
	t	3.049	3.111	-0.307	5.435
	Р	0.0024	0.002	0.759	< 0.001
Occupation	Civil servant, teacher or doctor (n=52)	$7.88 \pm 3.88$	$21.36{\pm}5.63$	$5.56 \pm 1.84$	34.80±9.52
	Private employed (n=154)	6.31±3.12	$20.49 \pm 5.44$	5.21±1.89	32.01±8.03
	Self-employed or unemployed (n=193)	$7.08 \pm 3.44$	$21.92{\pm}5.02$	$5.43 \pm 1.78$	$34.43 \pm 8.04$
	F	4.7972	1.5912	0.9678	4.3865
	Р	0.0087	0.205	0.3808	0.0131
Educational	Junior high school or lower (n=54)	$5.98 \pm 2.90$	19.92±5.15	5.20±1.91	
level	31.11±7.61				
	Senior high school(n=270)	6.56±3.28	21.08±5.37	5.41±1.83	33.05±8.72
	Collegeor above (n=75)	$8.08 \pm 3.68$	21.19±5.91	5.64±1.82	35.63±9.31
	F	7.9491	1.0804	0.7224	3.925
	Р	0.0004	0.3405	0.4862	0.0205
Income level	< ¥ 3000 (n=94)	6.64±3.28	20.75±5.29	5.20±1.91	32.73±8.37
	¥3000-¥5000 (n=199)	7.26±3.39	21.97±5.90	5.41±1.83	34.34±8.76
	>¥5000 (n=106)	8.68±4.20	22.12±5.52	5.64±1.82	36.66±9.62
	F	11.0911	1.922	1.2002	4.9676
	Р	< 0.001	0.1477	0.3022	0.0074
Marital status	Unmarried/divorced/widowed (n=51)	6.62±3.57	21.08±5.12	5.73±2.01	33.42±8.80
	Married (n=348)	7.32±3.59	21.28±5.56	5.32±1.78	33.93±8.84
	Р	0.1939	0.7269	0.1318	0.7004
Self-assessment	Good (n=27)	7.03±3.86	21.11±5.24	5.46±2.12	33.60±9.26
of health status	Moderate (n=156)	7.30±3.34	20.57±5.85	5.36±1.81	33.23±8.82
	Bad (n=216)	7.42±3.65	21.65±5.46	$5.43 \pm 1.80$	34.49±8.75
	F	0.1652	1.7814	0.0669	1.0151
	Р	0.8478	0.1698	0.9353	0.3633
Stage of cancer	Stage II (n=42)	7.95±3.54	22.75±5.24	5.75±1.79	34.40±8.41
	Stage III (n=257)	7.34±3.73	21.02±5.24	5.26±1.76	33.62±8.48
	Stage IV (n=100)	5.61±2.88	17.35±5.36	4.68±1.97	27.65±8.18
	F	10.2926	23.2015	5.375	24.2315
	Р	< 0.001	< 0.001	0.005	< 0.001

Table 5. Descriptive Statistics in SSRS									
SSRS Category	n (%)	Total Score (Mean±SD)	Objective Support Subscore	Subjective Support Subscore					
Lower support (≤37)	184 (46.1%)	29.3±5.2	8.1±2.4	12.7±3.1					
Higher support (>37)	215 (53.9%)	45.6±6.8	15.3±3.6	20.4±4.2					

The of Dogistic Regression multiple of The tors innovience Social Support	Table 6.	Logistic	Regression	Analysis	of Factors	Influencing	Social	Support
---	----------	----------	------------	----------	------------	-------------	--------	---------

		<u> </u>	1		
Variables	Partial regression coefficient	SE	x <sup>2</sup>	Р	OR (95%CI)
Age	-0.673	0.285	5.575	0.018	0.510 (0.292-0.892)
Income Level	0.426	0.173	6.066	0.014	1.531 (1.091-2.148)
Stage of Cancer	-0.324	0.133	5.917	0.015	0.723 (0.557-0.939)
Constant	0.992	0.534	3.456	0.063	2.696

Table 7. OLO-C30 Scores	of Participants with	Different Family	Functions
	or r articipanto miti	i Dinerene i annig	1 anotiono

Groups	Body function	Role function	Emotional function	Cognitive function	Social function
Well-functioning group (n=194)	57.43±5.31	52.51±7.04	61.71±6.74	63.21±7.25	40.72±6.94
Dysfunction group (n=205)	51.51±6.32	47.61±6.42	54.22±6.23	$56.42 \pm 6.74$	35.51±7.25
Р	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

was 33.12 (SD=7.92).Univariate analyses showed that there were significant differences in the APGAR score among socio-demographic variables such as age, occupation, educational level, income level and stage of cancer (P<0.05) (Table 4).

Social support was assessed using the 10-item Social Support Rating Scale (SSRS) with a total score ranging from 12 to 65. Based on established Chinese population norms (Xiao, 1994), participants were categorized as:Lower social support: SSRS score  $\leq$ 37 (n=184, 46.11%); Higher social support: SSRS score  $\geq$ 37 (n=215, 53.89%).

The SSRS demonstrated good reliability in our sample (Cronbach's  $\alpha$ =0.81)."(Table5). According to the cutoff score of the SSRS, participants were divided into groups with lower social support (n=184) and higher social support (n=215). With social support level as the dependent variable and age, occupation, educational level, income level and stage of cancer as the independent variables, unconditional logistic regression analysis was

conducted, and the results showed that, Age, income level and stage of cancer are influencing factors for the occurrence of social support disorders (Table 6).

# QLQ-C30 scores for participants with different family functions and social support

We selected five indexes of QLQ-C30, namely physical function, role function, emotional function, cognitive function and social function, which can best reflect participants' quality of life. Using the validated APGAR threshold for family dysfunction (score  $\leq 6$ ), participants were categorized into two groups: good family function (APGAR  $\geq 7$ , n=194) and poor family function (APGAR  $\leq 6$ , n=205). Comparative analysis of QLQ-C30 domains between these groups revealed significant differences in quality of life outcomes (all p<0.001). The well-functioning group was superior to the dysfunctional group among the five QLQ-C30 indexes(P<0.001) (Table 7). Building on the observed impact of family function on QLQ-C30 outcomes, we

Table 8	. OLC	D-C30	Scores	of Partic	ipants with	Different	Social	Support
Tuble 0	· VLV	2 0 5 0	000103	01 1 di tio	ipants with	Different	Doolai	Support

Groups	Body function	Role function	Emotional function	Cognitive function	Social function
Low social support group (n=294)	50.21±7.32	44.62±6.81	52.15±7.52	54.61±8.23	33.53±7.42
Higher social support group (n=105)	58.24±6.41	52.82±8.14	61.03±9.31	64.63±8.54	42.91±7.62
Р	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 9. Logistic Regression Analysis of Factors Influencing Quality of Life

Variables	Partial regression coefficient	Р	OR (95%CI)
Family functions	0.153	0.039	1.165 (1.008-1.346)
Objective support	0.031	0.02	1.032 (1.005-1.060)
Constant	-6.938	< 0.001	0.001

Asian Pacific Journal of Cancer Prevention, Vol 26 2141

further analyzed the role of social support. Consistent with the family function findings, participants with lower social support (SSRS  $\leq$ 37, n=294) exhibited significantly poorer scores across all functional domains compared to the higher social support group (SSRS >37, n=105), with absolute differences ranging from 8.03 (Body Function) to 11.88 (Emotional Function) (all p<0.001; Table 8). These results suggest that both family and social support systems independently contribute to quality of life.

# The relationship between family functioning, social support and quality of life

To transition from domain-level functioning to holistic quality of life assessment, we first quantified the cohort's overall QoL profile. Participants reported a mean global QoL score of 78.26 (SD=9.37; range:30-92), with this value serving as the threshold for subsequent comparative analyses. A cutoff score of 78.26 divided the participants into high (n=163) and low (n=236) groups, the high and low scores were grouped as dependent variables, unconditional logistic regression analysis was conducted with family function, subjective support, objective support and support utilization score as independent variables, and the results showed that family function and objective support were factors affecting quality of life (Table 9).

#### Discussion

This study investigated the family function, social support among gastrointestinal cancer patients and explored its association with quality of life. This kind of knowledge could contribute to a better understanding of the association between family function, social support and quality of life and inform healthcare providers of specific attention to gastrointestinal cancer patients. There are no specific studies that have investigated the specific effects of family function and social support on the quality of life of gastrointestinal cancer patients. Most of the previous studies have focused on the impact of psychological distress on gastrointestinal cancer patients [7, 11-14], explored its mechanism [8,15-17], and developed strategies for addressing psychological distress [18-20].

To the best of our knowledge, this is the first study to explore the impact of family function and social support on quality of life among Chinese patients with gastrointestinal cancer, as well as the relationship between these factors. We found an association between family function and social support on quality of life, this relationship shows better quality of life among gastrointestinal cancer patients who had good family function and social support. On the contrary, the lack of these factors will lead to a decline a decline in the quality of life of gastrointestinal cancer patients. These findings provide insights into how family function and social support may influence quality of life of Chinese patients with gastrointestinal cancer and how it differs based on socio-demographic characteristics.

Family function plays an important role in improving the end quality of life of patients with malignant tumors. In a study of advanced cancer patients, family function is related to psychosocial function of caregivers of advanced cancer patients. Therefore, the realization of the family support and the ability of the family members to share feelings and manage conflicts can be an effective strategy for improving the psychosocial function in families affected by cancer [21]. The end-of-life quality of care of patients with terminal cancer can be better improved through family functioning [22]. Various such studies have been carried out in China, where the family concept is deeply rooted, and it is common for generations to live together. Therefore, the family function has been highly important for gastrointestinal cancer patients in China, with its potential to significantly affect the quality of life. In this study, 59.15% of the participants reported family dysfunction, which in turn decrease their scores of the quality of life. Logistic regression analysis was further employed for investigating the age, marital status and stage of cancer as the main drivers for family dysfunction. Older age, unmarried or divorced/widowed, and cancer advanced stage were found the main factors for family dysfunction. These in turn decrease the quality of life of such cancer patients.

The role of social support in malignant cancer patients in China has not been emphasized, but it does have a positive effect on malignant cancer patients [23]. Coughlin reported that the stage of colorectal cancer at diagnosis and survival are significantly affected by the lack of social support and social isolation [24]. Social support can also improve psychological well-being, A study on colorectal cancer patients who have more social support may have better results in anxiety and anxiety depression at 1 year after surgery, adjusting for age, gender, location, occupation, and baseline HADS scores [25]. In addition, Bou-Samrareported that social support appears to be a robust factor affecting mortality in gastrointestinal cancer patients [26].

We found that social support can affect the quality of life of patients with malignant tumors. Among 399 participants, 73.68% had low social support. Our analysis shows that age, marital status, and stage of cancer are the influencing factors of social support disorder. After the decline in social support, patients also had lower quality of life scores, while higher social supporters were associated with higher quality of life scores. This is similar to the study by Liu et al. [27].

However, this study could not assess the level of social support that patients with gastrointestinal cancer had prior to developing the disease. Social support has been an important factor for improving the health-related quality of life in cancer patients. The study of Haviland et al. shows that, in nearly one-third patients of colorectal cancer, the levels of social support decline following diagnosis and treatment [28]. It can be speculated that gastrointestinal cancer is responsible for the decline in social support in patients. Early assessment of social support, along with ongoing evaluation throughout follow-up, would facilitate targeted interventions aimed at enhancing recovery, particularly for vulnerable patient groups at greater risk of inadequate social support.

In conclusion, in this study, we investigated the family dysfunction and social support status among patients with gastrointestinal cancer. Our findings revealed that 51.38% of these patients experienced family dysfunction, while 73.68% reported insufficient social support. Through our analysis, we identified several key influencing factors: age, marital status, and stage of cancer were associated with family dysfunction, whereas age, income level, and stage of cancer were linked to social support disorder.

Furthermore, our research underscored the significant relationship between family function, social support, and the quality of life of gastrointestinal cancer patients. Specifically, we found that family dysfunction and low social support can negatively impact patients' quality of life.

These findings contribute to the broader understanding of the challenges faced by gastrointestinal cancer patients and highlight the importance of considering family dynamics and social support in their management. Our research suggests that addressing these factors could be beneficial in designing rehabilitation programs for gastrointestinal cancer patients, potentially improving their overall well-being and outcomes.

# **Author Contribution Statement**

Lu Xin - acquisition of data, conception and design, drafting the article, revising critically, final approval. Jaruwan Viroj and Sumattana Glangkarn- conception and design, drafting the article, revising critically, final approval.

## Acknowledgements

We would like to thank all the participants for their disinterested contribution.

#### Ethical issue

This study was approved by the Institutional Review Board at Mahasarakham University and The First Affiliated Hospital of Henan University of Science and Technology, and conducted in accordance with the Declaration of Helsinki. Approval number 452-359/2024

#### Availability of data

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

#### Funding statement

This study is supported by research grants from the Science and the Technology Research and Development Joint Fund of Henan Province (222103810046); Science and Technology Research and Development Joint Fund of Henan Province (232103810047); China Guanghua Science and Technology Fund (ZL 2021102700003); Zhiquan Boai Fund (1030851); Luoyang Public Welfare Industry Medical and Health Special Project (2022001A).

# References

 Costa NR, Gil da Costa RM, Medeiros R. A viral map of gastrointestinal cancers. Life Sci. 2018;199:188-200. https:// doi.org/10.1016/j.lfs.2018.02.025.

- 2. Wild c, weiderpass e, stewart bw. World cancer report: Cancer research for cancer prevention. Iarc press; 2020.
- Cao W, Chen HD, Yu YW, Li N, Chen WQ. Changing profiles of cancer burden worldwide and in china: A secondary analysis of the global cancer statistics 2020. Chin Med J (Engl). 2021;134(7):783-91. https://doi.org/10.1097/ cm9.000000000001474.
- 4. Chung J, Ju G, Yang J, Jeong J, Jeong Y, Choi MK, et al. Prevalence of and factors associated with anxiety and depression in korean patients with newly diagnosed advanced gastrointestinal cancer. Korean J Intern Med. 2018;33(3):585-94. https://doi.org/10.3904/kjim.2016.108.
- Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68(6):394-424. https:// doi.org/10.3322/caac.21492.
- 6. Chen y, yao h, yan s, zhang h, zhang h, liuy, et al. A study on effects of attention and interpretation therapy for patients with gastrointestinal cancer. Chin j nurs. 2020;55(2):250-56. https://doi.org/10.3761/j.issn.0254-1769.2020.02.016.
- Yang x, he h, guo t, liu p, zhang y. A longitudinal study of psychological distress and its related factors in patients with gastric cancer during postoperative chemotherapy. J nurs sci. 2019;34(12):79-82.
- Cha KM, Chung YK, Lim KY, Noh JS, Chun M, Hyun SY, et al. Depression and insomnia as mediators of the relationship between distress and quality of life in cancer patients. J Affect Disord. 2017;217:260-5. https://doi.org/10.1016/j. jad.2017.04.020.
- Lee MK. Caregiving strain, family functioning, and effort to change diet for patients with gastrointestinal cancer: A cross-sectional descriptive study. Eur J Oncol Nurs. 2023;62:102264. https://doi.org/10.1016/j. ejon.2022.102264.
- Xiao s. Theoretical basis and research application of social support rating scale. J clin psychiat. 1994;4(2):98.
- 11. Hong J, Wei Z, Wang W. Preoperative psychological distress, coping and quality of life in chinese patients with newly diagnosed gastric cancer. J Clin Nurs. 2015;24(17-18):2439-47. https://doi.org/10.1111/jocn.12816.
- Tian X, Jin Y, Chen H, Tang L, Jiménez-Herrera MF. Relationships among social support, coping style, perceived stress, and psychological distress in chinese lung cancer patients. Asia Pac J Oncol Nurs. 2021;8(2):172-9. https:// doi.org/10.4103/apjon.apjon\_59\_20.
- Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. Psychooncology. 2001;10(1):19-28. https:// doi.org/10.1002/1099-1611(200101/02)10:1<19::aidpon501>3.0.co;2-6.
- Henselmans I, Helgeson VS, Seltman H, de Vries J, Sanderman R, Ranchor AV. Identification and prediction of distress trajectories in the first year after a breast cancer diagnosis. Health Psychol. 2010;29(2):160-8. https://doi. org/10.1037/a0017806.
- Nikbakhsh N, Moudi S, Abbasian S, Khafri S. Prevalence of depression and anxiety among cancer patients. Caspian J Intern Med. 2014;5(3):167-70.
- 16. Smith TG, Troeschel AN, Castro KM, Arora NK, Stein K, Lipscomb J, et al. Perceptions of patients with breast and colon cancer of the management of cancer-related pain, fatigue, and emotional distress in community oncology. J Clin Oncol. 2019;37(19):1666-76. https://doi.org/10.1200/ jco.18.01579.
- 17. Trevino KM, Maciejewski PK, Fasciano K, Greer J,

Partridge A, Kacel EL, et al. Coping and psychological distress in young adults with advanced cancer. J Support Oncol. 2012;10(3):124-30. https://doi.org/10.1016/j. suponc.2011.08.005.

- Kang Y, Son H. Age differences in the coping strategies of patients with colorectal cancer. Cancer Nurs. 2019;42(4):286-94. https://doi.org/10.1097/ncc.000000000000604.
- Lin J, Su Y, Lv X, Liu Q, Wang G, Wei J, et al. Perceived stressfulness mediates the effects of subjective social support and negative coping style on suicide risk in chinese patients with major depressive disorder. J Affect Disord. 2020;265:32-8. https://doi.org/10.1016/j.jad.2020.01.026.
- 20. Oh M, Kim JW, Yoon NH, Lee SA, Lee SM, Kang WS. Differences in personality, defense styles, and coping strategies in individuals with depressive disorder according to age groups across the lifespan. Psychiatry Investig. 2019;16(12):911-8. https://doi.org/10.30773/pi.2019.0160.
- Nissen KG, Trevino K, Lange T, Prigerson HG. Family relationships and psychosocial dysfunction among family caregivers of patients with advanced cancer. J Pain Symptom Manage. 2016;52(6):841-9.e1. https://doi.org/10.1016/j. jpainsymman.2016.07.006.
- Lee MK, Yun YH. Family functioning predicts end-of-life care quality in patients with cancer: Multicenter prospective cohort study. Cancer Nurs. 2018;41(3):E1-e10. https://doi. org/10.1097/ncc.000000000000495.
- Usta YY. Importance of social support in cancer patients. Asian Pac J Cancer Prev. 2012;13(8):3569-72. https://doi. org/10.7314/apjcp.2012.13.8.3569.
- Coughlin SS. Social determinants of colorectal cancer risk, stage, and survival: A systematic review. Int J Colorectal Dis. 2020;35(6):985-95. https://doi.org/10.1007/s00384-020-03585-z.
- 25. Gonzalez-Saenz de Tejada M, Bilbao A, Baré M, Briones E, Sarasqueta C, Quintana JM, et al. Association between social support, functional status, and change in health-related quality of life and changes in anxiety and depression in colorectal cancer patients. Psychooncology. 2017;26(9):1263-9. https://doi.org/10.1002/pon.4303.
- 26. Bou-Samra P, Scott P, Cheng H, Kallem C, Pathak R, Geller DA, et al. Social support is associated with survival in patients diagnosed with gastrointestinal cancer. J Gastrointest Cancer. 2022;53(4):854-61. https://doi.org/10.1007/s12029-021-00741-8.
- Dun L, Xian-Yi W, Si-Ting H. Effects of cognitive training and social support on cancer-related fatigue and quality of life in colorectal cancer survivors: A systematic review and metaanalysis. Integr Cancer Ther. 2022;21:15347354221081271. https://doi.org/10.1177/15347354221081271.
- 28. Haviland J, Sodergren S, Calman L, Corner J, Din A, Fenlon D, et al. Social support following diagnosis and treatment for colorectal cancer and associations with health-related quality of life: Results from the uk colorectal wellbeing (crew) cohort study. Psychooncology. 2017;26(12):2276-84. https://doi.org/10.1002/pon.4556.



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.