



The Quality of Life of Patients with Colorectal Cancer and a Stoma in China: A Quantitative Cross-sectional Study

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ABSTRACT

OBJECTIVE: To explore quality of life (QOL) in patients with colorectal cancer and a stoma and factors associated with their QOL.

METHODS: A quantitative cross-sectional study was carried out in the stoma and wound care clinic of a cancer hospital in China. Participants were recruited from clinic patients. Investigators collected demographic data and clinical information; QOL was measured using a Chinese version of the stoma-QOL scale.

RESULTS: In total, 359 participants took part; 161 (44.8%) had an ileostomy, whereas the others had a colostomy, and about half of the participants (46.5%) had a permanent stoma. The mean age was 57.86 ± 11.92 years. The QOL scores of most participants were poor, with a median value of 49.44. Participants whose stoma was cared for by others had a significantly lower QOL score than those who cared for their own stomas (odds ratio [OR], 1.58; 95% confidence interval [CI], 1.05–2.38; $P = .029$). Participants with a temporary stoma had a lower QOL score than those with a permanent stoma (OR, 2.08; 95% CI, 1.275–3.40; $P = .004$). Further, participants with a complication had a lower QOL score than those without (OR, 1.62; 95% CI, 1.07–2.43; $P = .022$).

CONCLUSIONS: These findings suggest a need for well-developed interventions to improve the QOL of these patients. This study provides valuable insights to inform the development of future clinical practice and research in this area in China and beyond.

KEYWORDS: colostomy, colorectal cancer, ileostomy, permanent stoma, quality of life, temporary stoma

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INTRODUCTION

A stoma is a surgically created opening on the abdomen that is connected to the digestive or urinary system to allow feces or urine to be diverted out of the body.¹ Common reasons for a stoma include colorectal cancer.² Globally, colorectal cancer ranks third in terms of incidence and second in terms of mortality among cancers.³ It is estimated that there were more than 1.8 million new cases and 881,000 deaths attributable to colorectal cancer worldwide in 2018, accounting for about 1 in 10 cancer deaths.³ Similar to the rest of the world, colorectal cancer is the third most common cancer in China with an estimated 370,000 new cases in 2014.⁴

The primary treatment for colorectal cancer is surgery, but many of the patients require a stoma after surgery as a lifesaving procedure.⁵ There are two types of stoma for patients with colorectal cancer: colostomy and ileostomy.⁵ A colostomy is a stoma formed by bringing part of the colon (ie, large intestine) to the abdomen. In an ileostomy, the small bowel is pulled out to the abdomen to form a stoma. A stoma can be either permanent or temporary.

Quality of life (QOL) for patients with a stoma is often not satisfactory.^{6,7} A stoma affects all aspects of everyday life; patients must not only learn how to care for their stoma, but also incorporate the stoma into their daily life.^{8,9} Compared with individuals without a stoma, those with a stoma are more likely to suffer from poor mental

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health; sexual dysfunction; or spiritual, social, psychological, and physical disorders.¹⁰

Coca et al¹¹ conducted a study to explore the impact of specialized ostomy nursing care on health-related QOL in patients with ostomies, reporting that participants who received such care had higher QOL than those who did not. Patient self-efficacy, capacity for self-care, and acceptance of illness also play a role in QOL.^{6,12}

In China, to the authors' knowledge, there is little primary research that has been conducted to understand factors that influence the QOL of patients with a stoma. The current study aimed to address this gap to help inform the development of future interventions for enhanced care and support of patients with a stoma.

METHODS

A quantitative cross-sectional design was used to investigate the level of QOL in patients with colorectal cancer with a stoma and to explore factors that were associated with their QOL. The study was carried out in a stoma and wound care clinic in a cancer hospital in Hunan province, China, among a convenience sample of patients.

The inclusion criteria were patients with colorectal cancer 18 years or older, with a stoma (colostomy or ileostomy), native Chinese language speakers, and those with the capacity to consent. Patients who had more than one stoma or no capacity to consent were excluded.

Procedure

An enterostomal therapist who worked in the clinic where the study was carried out collected the data between March 2017 and February 2019. Eligible patients who visited the clinic were taken to a consulting room and were presented with a study information packet containing a stoma care handbook, an information sheet, a consent form, and the study questionnaire. Once informed consent was provided, participants were asked to complete the questionnaire in the room. The enterostomal therapist remained available to answer any queries related to the study. It took about 15 to 20 minutes to fill in the questionnaire and demographic information. Information related to the patient's illness was collected by the enterostomal therapist.

Instruments and Outcomes

A Chinese version of the stoma-QOL scale was used as the questionnaire to assess participants' QOL.¹³ This is a self-reporting instrument originally developed in English to assess the QOL of people with a stoma.¹ The scale was initially validated with a group of patients with colostomy or ileostomy. It comprises 20 items that cover several domains such as concerns about the stoma, sleep, sexual activity, relationships with family and close friends,

and social interactions.¹⁴ Each item is answered using a 4-point Likert-type scale where 1 is "always," 2 is "sometimes," 3 is "rarely," and 4 is "not at all." The total raw score ranges from 0 to 80, and the final score ranges from 0 to 100. Patient QOL is divided into four levels based on the final score: worst (0–30.00), poor (30.01–50.00), good (50.01–70.00), and best (70.01–100.00).¹⁵

Originally, Prieto et al¹ found that the scale had high levels of internal reliability (Cronbach $\alpha = .92$) and high test-retest reliability ($r > 0.88$). The stoma-QOL scale was translated into Chinese by Wu et al¹³ and tested with 118 Chinese patients with a colostomy, ileostomy, or urostomy. Good reliability and validity of the translated scale were reported (Cronbach $\alpha = .89$; test-retest reliability = 0.81–1.00). Each item was correlated with the total score ($r = 0.30$ – 0.79 ; $P < .01$).

The questionnaire also requested demographic data (age, sex, highest education level, employment, place of residence, and financial status. Illness-related information (type of stoma, permanent/temporary stoma, stoma care, complications, duration of stoma, and the stoma baseplate retention time) was also collected.

Data Analysis

SPSS version 23.0 (SPSS Inc, Chicago, Illinois) was used to perform data analysis. Descriptive statistics were calculated including means, SDs, medians, and frequencies. Q-Q and normality plots with tests were conducted to examine normality distribution of the data. Data were considered normally distributed if $P > .05$, or the skewness and kurtosis statistics was not more than 1.96 times their respective standard error.¹⁶ Means, SDs, minimums, and maximums were calculated for normally distributed variables (eg, age). Percentages were calculated to show the distribution of enumeration data (eg, age, sex, highest education level, employment, residence, financial status, diagnosis, type of stoma, permanent/temporary stoma, site marked, stoma care, and complications). Medians and lower/upper quartiles were calculated to report variables that were not normally distributed, including stoma duration and baseplate retention time. Internal consistency and reliability of the stoma-QOL scale were tested using Cronbach α . An α value greater than .7 indicated acceptable internal consistency.¹⁷ Univariate analysis and Spearman correlation tests were carried out, and all variables with a $P < .05$ were retained for ordinal logistic regression analyses. The set of variables used for the analysis in the final model was determined after a stepwise selection procedure. All statistical tests performed were two-tailed, and $P < .05$ was considered statistically significant.

Ethical Considerations

The research was approved by an independent ethics committee identified by the hospital where the study

was carried out (approval no. 2019year16th). General ethical principles in health and social care were followed. An information sheet with details about the study and the nature of participation was provided. Participation was voluntary, and all participants provided a signed consent form. Participants were assured that their care was not affected by their decision to participate and that any information they provided would remain confidential and unidentified.

RESULTS

In total, 375 participants were recruited. Of these, 359 patients returned their questionnaires, a response rate of 95.7%. The questionnaires were all complete and included in the analysis.

Table 1 summarizes the demographic characteristics of the participants. All patients received preoperative teaching. Of the 359 participants, 199 (55.4%) were between 45 and 65 years old, and 117 (32.6%) were 65 years or older; and 217 (60.4%) were male. The majority of participants were educated at either a primary or secondary school level (44.6% and 40.4%, respectively). Most participants (42.9%) lived in rural areas, and more than half (60.4%) were unemployed. In terms of socioeconomic status, the majority of respondents either could not make ends meet (43.7%) or earned just enough to make ends meet (38.4%).

Participants' illness-related characteristics are shown in Table 2. Of all the participants, 198 (55.2%) had a colostomy. More than half of all the participants (53.5%)

Table 1. PARTICIPANT DEMOGRAPHICS (N = 359)

Variable	Descriptive Characteristic	n (%)
Age	≥18 and <45	43 (12.0)
	≥45 and <65	199 (55.4)
	≥65	117 (32.6)
Sex	Male	217 (60.4)
	Female	142 (39.6)
Highest education level	Primary school	145 (40.4)
	Secondary school	160 (44.6)
	Diploma or above	54 (15.0)
Employment	Employed	57 (15.9)
	Unemployed	217 (60.4)
	Retired	85 (23.7)
Area of residence	City	112 (31.2)
	District	93 (25.9)
	Village	154 (42.9)
Financial status	Cannot make ends meet	157 (43.7)
	Just enough to make ends meet	138 (38.4)
	Earns more than expenditure	64 (17.8)

Table 2. ILLNESS CHARACTERISTICS (N = 359)

Variable	Descriptive Characteristic	n (%)
Stage of cancer	Stage I	7 (1.9)
	Stage II	128 (35.7)
	Stage III	203 (56.5)
	Stage IV	21 (5.8)
Type of stoma	Colostomy	198 (55.2)
	Ileostomy	161 (44.8)
Permanent/temporary stoma	Permanent	167 (46.5)
	Temporary	192 (53.5)
Person caring for the stoma baseplate	Mainly or completely by themselves	197 (54.9)
	Mainly or completely by others	162 (45.1)
Complication	No	146 (40.7)
	Yes	213 (59.3)
Stoma duration, mo	<12	274 (76.3)
	12–24	34 (9.5)
	≥24	51 (14.2)
Stoma baseplate retention time, d	<3	45 (12.5)
	≥3 and <7	230 (64.1)
	≥7	84 (23.4)

had a temporary stoma. The median stoma duration was 4 months (lower-upper quartile, 1–10.5 months), and the median number of days that stoma baseplates were retained was 5 (lower-upper quartile, 3–6 days).

The Cronbach α of the stoma-QOL was .951 (95% confidence interval [CI], .943–.959). Table 3 shows participants' QOL scores. The mean score was 46.93 ± 17.25 ; QOL scores of more than half of the participants were either worst (11.4%) or poor (41.2%). The QOL scores of the remaining participants were good (42.9%), and only 4.5% stated they had the best QOL.

Univariate analysis was used to identify whether demographic variables and illness-related variables had an impact on participants' overall QOL scores (Tables 4 and 5) and/or individual domains of QOL (Supplemental Table 1, <http://links.lww.com/NSW/A71>; Supplemental Table 2, <http://links.lww.com/NSW/A72>). Employment and good financial status had a positive impact on some domains of QOL ($P < .05$), as well as certain illness-related variables (temporary/permanent stoma, type of stoma, stoma care, stoma duration, and complications).

Ordinal logistic regression analysis was used to determine which factors were associated with stoma-QOL scores ($P < .05$ were included). The following variables were analyzed: temporary/permanent stoma, type of stoma, stoma care, stoma duration, and complications. The results showed that participants with a temporary stoma had a lower QOL score than those with a permanent stoma (odds ratio [OR], 2.08; 95% CI, 1.27–3.40;

**Table 3. QUALITY OF LIFE SCORES (N = 359)**

Domain	Mean (SD)
Overall	46.93 (17.25)
Concerns related to stoma	2.00 (0.77)
Sleep	2.46 (0.83)
Social and family relationships	2.26 (0.88)
Sexuality and body image	2.32 (0.81)

$P < .05$); participants whose stomas were cared for completely or mainly by others had a significantly lower QOL score than those who conducted self-care (OR, 1.60; 95% CI, 1.05–2.38; $P < .05$), and participants with a complication had poorer QOL than those without (OR, 1.61; 95% CI, 1.07–2.43; $P < .05$; Table 6).

DISCUSSION

This study explored QOL among patients with a stoma in China and associated factors that affected their QOL. The QOL scores of more than half of the participants were “worst” or “poor” (11.4% and 41.2%, respectively). The mean score was also poor (46.93 ± 17.25), as were the mean scores of all four stoma-QOL domains. These findings were consistent with those reported by others elsewhere. Similarly, Boraii¹⁸ and Vonk-Klaassen et al⁹ reported that living with a colostomy bag negatively influenced the overall QOL of participants in their studies.

Results from the univariate analysis revealed many factors influenced participants’ QOL: employment, financial status, stage of cancer, type of stoma, permanent/temporary stoma, the care of stoma baseplate, complications, the stoma duration, and stoma baseplate retention time. Employment status and stoma duration affected the concerns related to stoma, sleep, and sexuality and body image domains; these patients might have had a stoma for a long period of time, their stoma baseplate retention time might be relatively longer, and accordingly they may have become used to the stoma and could care for the stoma better themselves. Similar findings have been reported by other studies.¹⁹

Stage of cancer affected concerns related to the stoma and social and family relationships; individuals in early cancer stages with a stoma may have better QOL because the tumor is often close to the anus, are less likely to need chemical treatment or radiation therapy, and have a lower cost burden than with advanced stages of cancer.²⁰ Financial status affected the sleep and social and family relationships domains; if individuals can afford the costs of care, they and their families experience less anxiety, improving QOL.^{21,22}

Having an ileostomy, a temporary stoma, or a complication and having stoma baseplate cared for by others were also found to affect four domains of QOL. An ileostomy

is always temporary and may be harder to care for and accompanied by complications, thus lowering QOL.^{23,24}

Results from the ordinal logistic regression analysis in this study revealed three key factors that had influenced participants’ QOL: temporary or permanent stoma, who cared for the stoma, and whether the participant had experienced complications.

Participants with a temporary stoma were found to have lower QOL than those with a permanent stoma, a finding in accordance with related studies.^{25,26} Individuals with a permanent stoma often adapt better than those with a temporary stoma.²³ Similarly, in another study, Diant et al²⁴ reported that the QOL of people with a temporary ostomy was lower than those with a permanent stoma. Ileostomies tend to be temporary and lead to large loose stools with a lot of peptic enzymes that are difficult to care for, with a high chance of leakage. This could contribute to the occurrence of complications, which in turn have a negative impact on QOL.

In this study, almost half of the participants had to rely on others to care for their stoma. This figure is higher compared with those reported in other studies.^{27,28} For patients with a temporary stoma, it is possible that they did not feel the need to learn how to change their stoma bag and baseplate if they had a caregiver or nurse to

Table 4. QUALITY OF LIFE SCORES BY DEMOGRAPHIC CHARACTERISTIC (N = 359)

Variable	Descriptive Characteristic	Mean Score (SD)	95% Confidence Interval	F	P
Age, y	≥18 and <45	48.22 (16.23)	43.22–53.21	1.15	.22
	≥45 and <65	47.99 (16.30)	45.71–50.27		
	≥65	44.66 (19.03)	41.18–48.15		
Sex	Male	46.00 (18.21)	43.56–48.44	1.62	0.20
	Female	48.36 (15.63)	45.77–50.96		
Highest education level	Primary education	45.24 (16.57)	42.52–47.96	1.35	0.26
	Secondary education	48.49 (17.57)	45.75–51.23		
	Diploma or above	46.87 (17.98)	41.96–51.77		
Employment	Employee	47.35 (16.48)	42.97–51.72	1.27	0.28
	Unemployed	47.84 (17.65)	45.48–50.20		
	Retired	44.35 (16.66)	40.75–47.94		
Residence	City	47.89 (17.47)	44.62–51.16	0.29	0.75
	Districts	46.08 (16.66)	42.65–49.51		
	Villages	46.76 (17.52)	43.97–49.54		
Financial status	Cannot make ends meet	45.57 (17.46)	42.82–48.33	1.41	0.25
	Just enough to cover expenditure	48.85 (16.31)	46.11–51.60		
	Earns more than expenditure	46.14 (18.56)	41.50–50.77		

provide care, given that the stoma would be reversed in the short term. Further, in Chinese culture, caregivers do not want patients to have to perform self-care, such as changing their baseplate. There may also be a gender difference. Anecdotally, these providers often see men with a permanent stoma who have never changed their own stoma bag or baseplate, even though they had surgery years ago. Men in particular may believe it is difficult to change the stoma baseplate, so they only change the bag; many do not want to see or touch the feces. One recent study²⁹ showed that men typically have lower self-care maintenance and monitoring.

Findings from this study also indicated that participants who completely or mainly cared for their stoma by themselves reported higher QOL. Participants who were not dependent on others to take care of their stoma were less likely to become anxious when the pouch was full, loose, or leaking. Similar findings have been reported in previous studies.^{12,30} Ultimately, individuals' ability to take care of their own stomas is a key influencing factor associated with their QOL.^{31–33}

Participants with a complication had lower QOL than those without a complication. It is common for QOL to be influenced by clinical complications,³⁴ available support and services,¹¹ and personal variables.³⁵ The main

Table 6. ORDINAL LOGISTIC REGRESSION ANALYSIS OF FACTORS BY EFFECT ON QUALITY OF LIFE

Factors	Estimate	Odds Ratio	P	95% Confidence Interval	
				Lower Bound	Upper Bound
Stoma totally or mostly cared for by others	0.457	1.57933	.029	1.04917	2.37738
Stoma completely or mostly cared for by self	0				
Stoma duration <12 mo	0.280	1.32313	.352	0.73418	2.38214
Stoma duration between 12 and 24 mo	0.064	1.06609	.881	0.46163	2.46206
Stoma duration ≥24 mo	0				
Ileostomy	0.022	1.02224	.930	0.62876	1.66030
Colostomy	0				
Temporary stoma	0.732	2.07923	.004	1.27125	3.39736
Permanent stoma	0				
Complications	0.478	1.61285	.022	1.07037	2.42784
No complications	0				

clinical complications of a stoma include peristomal skin complications, prolapse, and parastomal hernia.³⁶ It has been found that patients with skin irritation tended to have lower QOL.^{34,37} Severe complications can affect patients psychologically by causing distress and anxiety and physically by requiring reoperation.^{36,38} Some of the most prevalent complications of stoma creation include skin irritation, peristomal infection, parastomal herniation, and stoma prolapse.³⁶ Maydick-Youngberg³⁴ reported that skin complications from stoma creation are negatively associated with QOL. In another study, Nichols and Ingles³⁹ pointed out that peristomal skin complications could become an intermittent yet lifelong problem for patients living with a stoma.

Limitations

Study participants were recruited as a convenience sample from patients who visited the stoma and wound care clinic in one oncology hospital, and therefore findings from this study may not be generalizable to patients with a stoma from other areas in China and beyond. Second, the study was not a cancer- or site-specific survey, and certain presurgical data were not collected (whether patients were marked for placement prior to surgery, whether they take part in peer support groups, or information about caregivers); this information could have yielded more nuanced results.

Implications for Practice

Given that the permanent or temporary nature of a stoma had a significant impact on participants' QOL, providers

Table 5. QUALITY OF LIFE SCORES BY ILLNESS-RELATED CHARACTERISTIC (N = 359)

Variable	Descriptive Characteristic	Mean	95% Confidence Interval	F	P
Stage of cancer	Stage I	51.43 (11.22)	41.05–61.81	1.63	.18
	Stage II	47.68 (16.85)	44.74–50.63		
	Stage III	47.10 (17.57)	44.66–49.53		
	Stage IV	39.29 (17.12)	31.49–47.08		
Type of stoma	Colostomy	49.53 (15.93)	47.30–51.76	10.25	<.01
	Ileostomy	43.74 (18.30)	40.89–46.59		
Permanent/temporary stoma	Permanent	51.09 (15.24)	48.77–53.42	19.08	<.01
	Temporary	43.32 (18.10)	40.74–45.89		
Stoma baseplate care	Completely or mostly self-care	49.51 (16.31)	47.22–51.80	10.00	<.01
	Totally or mostly care by others	43.80 (17.89)	41.02–46.57		
Complication	No	50.92 (16.78)	48.18–53.67	13.63	<.01
	Yes	44.20 (17.07)	41.89–46.50		
Stoma duration, mo	<12	45.52 (17.46)	43.44–47.60	4.10	.02
	≥12 and <24	50.26 (18.73)	43.73–56.80		
	≥24	52.31 (13.70)	48.46–56.17		
Stoma baseplate retention time, d	<3	42.24 (18.55)	36.67–47.82	2.06	.13
	≥3 and <7	47.93 (16.48)	45.79–50.07		
	≥7	46.73 (18.36)	42.74–50.71		



should pay more attention to patients with a temporary stoma by identifying their individual care needs and offering appropriate support. Further, based on the finding that QOL was positively associated with participants' capacity for self-care, individuals could benefit from patient teaching in this arena. All nurses should be trained on general stoma care, and enterostomal therapists should take a leading role in empowering patients with knowledge and skills related to stoma care. Peer support groups could help patients share their experiences of stoma care, as well as their psychological issues associated with living with a stoma.

Critically, stoma complications were found to be associated with reduced QOL. Adequate prevention efforts are crucial, including careful selection of a suitable stoma site before surgery, because this can reduce complications such as skin irritation and parastomal herniation.⁴⁰ In addition, appropriate stoma products and accessories can help prevent allergic contact dermatitis and leakage and thus protect peristomal skin.

CONCLUSIONS

Findings from this study revealed a generally low level of QOL among a sample of people with a stoma in China. The permanent/temporary nature of a stoma, the capacity for stoma self-care, and complications can have a large impact on the QOL of people with a stoma. These results highlight the need for well-developed interventions to improve the QOL of patients living with a stoma. Findings of this study provide valuable insights to inform clinical practice and research in this area in China and beyond. ●

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Supplemental Table 1. DEMOGRAPHIC CHARACTERISTICS IN RELATION TO INDIVIDUAL DOMAINS OF THE STOMA-QUALITY OF LIFE SCALE (N = 359)

Variable	Descriptive Characteristics	Concerns Related to Stoma				Sleep				Social and Family Relationships				Sexuality and Body Image			
		Mean	SD	F	P	Mean	SD	F	P	Mean	SD	F	P	Mean	SD	F	P
Age, y	≥18 and <45	2.01	0.72	0.18	.84	2.65	0.81	1.96	.14	2.31	0.86	0.72	.49	2.31	0.75	0.19	.83
	≥45 and <65	2.02	0.80			2.48	0.83			2.30	0.88			2.34	0.81		
	≥65	1.96	0.74			2.36	0.84			2.18	0.90			2.28	0.82		
Sex	Male	1.95	0.76	2.02	.16	2.44	0.88	0.40	.53	2.23	0.88	0.71	.40	2.31	0.82	0.02	.89
	Female	2.07	0.79			2.50	0.77			2.31	0.89			2.33	0.79		
Highest education level	Primary school	1.95	0.72	0.64	.53	2.44	0.78	0.83	.44	2.15	0.82	2.06	.13	2.29	0.76	1.53	.22
	Secondary school	2.05	0.80			2.52	0.90			2.34	0.90			2.39	0.83		
	Diploma or above	1.99	0.82			2.36	0.78			2.33	0.99			2.18	0.85		
Employment	Employee	2.07	0.82	3.41	.03	2.61	0.82	2.63	.07	2.29	0.88	0.94	.39	2.36	0.80	3.40	.03
	Unemployed	1.81	0.68			2.30	0.80			2.15	0.85			2.12	0.79		
	Retired	2.05	0.78			2.49	0.84			2.30	0.90			2.38	0.81		
Residence	City	2.03	0.83	0.30	.74	2.47	0.84	0.03	.97	2.33	0.94	0.48	.62	2.32	0.85	0.37	.69
	Districts	1.95	0.73			2.44	0.85			2.25	0.90			2.26	0.75		
	Villages	2.01	0.76			2.47	0.83			2.22	0.84			2.35	0.81		
Financial status	Cannot make ends meet	1.96	0.75	2.27	.11	2.42	0.83	2.58	.08	2.15	0.84	3.05	.05	2.27	0.80	0.55	.58
	Just enough to cover expenditure	2.10	0.75			2.42	0.80			2.40	0.86			2.37	0.80		
	Earns more than expenditure	1.88	0.84			2.68	0.90			2.25	1.01			2.32	0.85		

**Supplemental Table 2. ILLNESS-RELATED CHARACTERISTICS IN RELATION TO INDIVIDUAL DOMAINS OF THE STOMA-QUALITY OF LIFE SCALE (N = 359)**

Variable	Descriptive Characteristic	Concerns Related to Stoma				Sleep				Social and Family Relationships				Sexuality and Body Image			
		Mean	SD	F	P	Mean	SD	F	P	Mean	SD	F	P	Mean	SD	F	P
Stage of cancer	Stage I	2.37	1.10	2.42	.07	2.90	0.83	0.68	.56	2.25	0.72	2.78	.04	2.57	1.05	0.50	.69
	Stage II	2.00	0.76			2.46	0.87			2.30	0.88			2.34	0.83		
	Stage III	2.02	0.77			2.45	0.81			2.29	0.89			2.31	0.78		
	Stage IV	1.61	0.65			2.41	0.86			1.73	0.86			2.17	0.87		
Type of stoma	Colostomy	2.09	0.79	6.80	.01	2.55	0.81	5.26	.02	2.39	0.87	9.55	<.001	2.44	0.77	10.88	<.001
	Ileostomy	1.88	0.74			2.35	0.85			2.10	0.88			2.16	0.83		
Permanent/temporary stoma	Permanent	2.17	0.79	15.76	<.001	2.63	0.83	13.30	<.001	2.42	0.86	10.58	<.001	2.50	0.76	15.69	.001
	Temporary	1.85	0.72			2.32	0.81			2.12	0.89			2.16	0.81		
Care of stoma baseplate	Completely or mostly self-care	2.08	0.82	4.77	.03	2.59	0.84	10.12	<.001	2.38	0.90	7.22	.01	2.39	0.80	3.82	.05
	Totally or mostly care by others	1.90	0.70			2.31	0.80			2.13	0.85			2.23	0.81		
Complication	No	2.22	0.85	20.34	<.001	2.58	0.85	4.66	.03	2.48	0.89	15.96	.00	2.46	0.82	7.81	.01
	Yes	1.85	0.68			2.39	0.82			2.11	0.85			2.22	0.78		
Stoma duration, mo	<12	1.96	0.73	2.15	.12	2.37	0.78	6.91	<.001	2.23	0.90	0.90	.41	2.25	0.79	4.25	.02
	≥12 and <24	2.06	0.92			2.81	0.97			2.34	0.83			2.46	0.84		
	≥24	2.19	0.87			2.71	0.91			2.39	0.86			2.58	0.81		
Stoma baseplate retention time, d	<3	1.77	0.65	4.30	.01	2.12	0.80	4.86	.01	2.07	0.89	2.20	.11	2.16	0.78	1.31	.27
	≥3 and <7	1.98	0.76			2.49	0.81			2.33	0.88			2.32	0.80		
	≥7	2.18	0.83			2.58	0.89			2.17	0.89			2.40	0.83		