

Psychosocial Adjustment in Korean Colorectal Cancer Survivors

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Purpose: The increasing survival rate of colorectal cancer demands various nursing interventions and continuous care for patients to adapt to their psychosocial daily lives. The purpose of this study was to identify factors associated with psychosocial adjustment in colorectal cancer survivors. **Methods:** A cross-sectional descriptive study with face-to-face interviews was conducted of 156 colorectal cancer survivors after surgery visiting an outpatient cancer clinic at a tertiary hospital in S city, Korea. Posttraumatic growth, health-promoting behavior, length of treatment, difficulty in activities of daily living, and having a stoma were entered into the linear regression model. **Results:** The strongest factor influencing the level of psychosocial adjustment was health-promoting behavior ($\beta=.33, p<.001$), followed by difficulty in activities of daily living ($\beta=-.24, p=.001$), posttraumatic growth ($\beta=.20, p=.004$), and having a stoma ($\beta=-.19, p=.004$). **Conclusion:** Nursing interventions for psychosocial adjustment in colorectal cancer survivors need to include the contents for posttraumatic growth, as well as health-promoting behavior, and activities of daily living.

Key words: Social Adjustment; Colorectal Neoplasms; Health Promotion; Growth

INTRODUCTION

The prevalence of colorectal cancer is the second highest after stomach cancer in Korea [1]. Advanced diagnostic and medical technologies have raised the rate of early detection of colorectal cancer, and its five-year relative survival rate increased from 54.8% in 1993~1995 to 76.3% in 2010~2014 [2]. These increases suggest that there are many patients who are in need of managing their disease process continuously, resulting in demands for various nursing interventions for psychosocial adjustment in their communities. However, clinical outcome measures are mostly confined to laboratory results, complication rates, and death, which often overlook those aspects of functioning and fall short of providing a complete picture of how patients' lives have been

affected by the disease and its sequelae [3].

As a traumatic event, cancer causes patients to face a variety of stressful situations from the moment of diagnosis such as fear and anxiety of death, high-risk recurrence and metastasis, and uncertainty about the future [4]. Moreover, colorectal cancer survivors mostly suffer from frequent bowel movements, fecal incontinence, and difficulty in activities of daily living, and some are obliged to have a stoma [5]. These changes in appearance and physical functions result in psychological atrophy and social isolation [6].

Although cancer causes traumatic impacts on lifestyle [4,6], during the process of overcoming, some survivors experience positive growth with respect to their life values and report affirmative changes in relationships with others, indicating posttrau-

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matic growth [7]. Posttraumatic growth has been reported in a certain portion of individuals undergoing traumatic episodes of natural disaster, sexual assault, or military attacks [7]. Recently, these positive changes are notable in individuals enduring treatment of life-threatening illness. The posttraumatic growth in cancer survivors contributes to an improved lifestyle [8]. However, there are few studies of posttraumatic growth among colorectal cancer survivors in Korea. On the one hand, although cancer survivors should maintain health-promoting behaviors continuously to minimize the after-effects of treatment and to prevent recurrence and metastasis [9,10], little is known about the relationship between their healthy behaviors and psychosocial adjustment to daily life. It is important to understand the psychosocial adjustment of colorectal cancer survivors through multidimensional approaches [3]. However, there is a lack of studies of psychosocial adjustment in Korean colorectal cancer survivors [11].

The purpose of this study was to identify the factors associated with psychosocial adjustment in Korean colorectal cancer survivors after surgery. The study addressed the following research objectives:

- To identify general characteristics contributing to levels of psychosocial adjustment in Korean colorectal cancer survivors.
- To identify factors associated with psychosocial adjustment in Korean colorectal cancer survivors.

METHODS

1. Study design

A cross-sectional descriptive design with face-to-face interviews was used to identify the factors associated with psychosocial adjustment in colorectal cancer survivors after surgery.

2. Setting and sample

The participants were 156 colorectal cancer survivors visiting an outpatient cancer clinic after surgery in a tertiary hospital in S city, Korea. The inclusion criteria were: 1) individuals over 18 years old who were receiving continuous colorectal cancer treatments after surgery; 2) individuals who were experiencing no recurrence of cancer; and 3) individuals who were not taking any

antipsychotic agents.

The sample size was calculated as 138 using the G*Power 3.1.9 program for statistical power analysis, with a significance level of .05, a power of .95, a medium effect size of .15 for multiple regression, and five independent variables (posttraumatic growth, health-promoting behavior, difficulty in activities of daily living, length of treatment, and having a stoma). Considering an expected attrition rate of 30%, 183 individuals were recruited. The final sample was 156 participants with the exclusion of 27 individuals who wanted to stop participating during interview arrangements due to a scheduling conflict (n=19) or who were reported to pall on the survey queries during the interview (n=8).

3. Ethical consideration

The ethical approval of this study was obtained from the institutional review board (IRB) of the hospital (approval no. AM-CIRB2016-0146). The individuals were contacted voluntarily through the study flyers, and the researcher explained the study procedure, including the participants' rights, before obtaining the informed consents. Individuals were also informed that they were free to withdraw from the study at any time. After receiving the written informed consents voluntarily, the researcher explained the survey queries one-on-one. All data were treated anonymously with study identification numbers.

4. Instruments

The modified Posttraumatic Growth Inventory for cancer survivors was used to measure posttraumatic growth [6,12]. The scale consists of 21 questions with five subdomains, including appreciation of life (three questions), new possibilities (five questions), personal strength (four questions), spiritual change (two questions), and relating to others (seven questions). Each item was scored on a 6-point Likert scale from 0 to 5. A higher average score indicates greater posttraumatic positive growth. The internal consistency of the tool was Cronbach's $\alpha=.97$ at the time of development [12] and .96 in this study.

The revised Health-Promoting Behavior Scale [13,14] is composed of a total of 38 questions with six subdomains, including nutrition (10 questions), physical activity (five questions), stress management (five questions), interpersonal relations (five questions), health responsibility (five questions), and spiritual growth

(eight questions). Each item was scored on a 4-point Likert scale from 1 to 4. A higher average score indicates a higher degree of health-promoting behavior. The reliability was Cronbach's $\alpha=.92$ at the time of development [14] and .92 in this study.

The Psychosocial Adjustment to Illness Scale for cancer survivors [15] is composed of a total of 46 questions with seven sub-domains, including health management (eight questions), social environment (six questions), home environment (eight questions), sexual relationships (six questions), extended family relationships (five questions), job environment (six questions), and psychological distress (seven questions). Each item was scored on a 5-point Likert scale from 1 to 5. Higher average scores indicate a higher level of psychosocial adjustment. The reliability was Cronbach's $\alpha=.56-.86$ at the time of the development [15] and .86 in this study.

General characteristics were collected, including: gender, age, marital status, educational level, religion, attitude toward religion, monthly income, unemployment due to treatment, length of treatment, difficulty in activities of daily living, cancer stage, treatment method, having a stoma, person caring for stoma, and attending the stoma support group.

5. Study procedures

After the IRB approval, the data were collected at the outpatient cancer clinic of the colorectal surgery department from March 14th, 2016 to May 21th, 2016. The colorectal cancer survivors voluntarily contacted us via the study flyers attached on the clinic bulletin board. The researcher explained to the individuals the purpose and contents of the study, confidentiality, and the participants' rights. The data collection place was the outpatient counseling room at the colorectal surgery department to maintain comfort and confidentiality, which might reduce attrition bias. The interview time was around 30 minutes on average.

6. Data analysis

Data were analyzed using SPSS/PC version 22.0 (IBM SPSS Statistics-Korea, Seoul, Korea). Descriptive statistics were used to describe the general characteristics and study variables. Tests for normality were conducted using the Shapiro-Wilk test and Kolmogorov-Smirnov before the parametric statistics and revealed normal distributions of continuous variables. Differences in

the level of psychosocial adjustment by the general characteristics were analyzed using t-test and ANOVA. The post-hoc test was conducted with the Scheffe test. The correlations between post-traumatic growth, health-promoting behavior, general characteristics (having a stoma and difficulty in activities of daily living), and psychosocial adjustment were analyzed using the Pearson Correlation Coefficient. A multiple linear regression analysis was carried out to determine the influencing factors on psychosocial adjustment in colorectal cancer survivors.

RESULTS

1. General characteristics and study variables

The average age of the colorectal cancer survivors was 54.68 years old, and 17.3% had survived for five years or more. Participants who had religion were 60.3%, and 60.9% responded that their religious life was important. Fifty-nine participants (37.8%) could not hold a job due to cancer treatment. For the level of activities of daily living, 10.3% reported moderate or severe difficulty in activities of daily living. Participants at cancer stage III or IV were 50.0%, and 30.2% had a stoma after surgery. Among those with a stoma, 62.5% were managing it themselves, and 91.7% were not attending the stoma support group. The average scores of posttraumatic growth, health-promoting behavior, and psychosocial adjustment were 2.97 ± 1.11 , 2.70 ± 0.43 , and 3.58 ± 0.44 , respectively (Table 1).

2. Differences in the level of psychosocial adjustment by general characteristics

The level of the psychosocial adjustment was significantly lower in participants who could not hold a job due to cancer treatment ($t=-2.08$, $p=.039$). Individuals having difficulty in activities of daily living ($F=18.21$, $p<.001$), having a stoma ($t=-4.20$, $p<.001$), and not attending the stoma support group ($t=2.73$, $p=.009$) had lower levels of psychosocial adjustment, while it was higher in those under a longer period of treatment care after surgery ($F=6.14$, $p=.003$). Post-hoc analysis revealed that length of treatment less than two years and no difficulty in activities of daily living contributed to the significant differences in psychosocial adjustment among subgroups (Table 2).

Table 1. General Characteristics and Study Variables

(N=156)

| Variables | Categories | N (%) | M±SD |
|--|--|------------|------------|
| Gender | Male | 100 (64.1) | 54.68±9.42 |
| | Female | 56 (35.9) | |
| Age (yrs) | <40 | 11 (7.1) | 54.68±9.42 |
| | 40~<50 | 31 (19.9) | |
| | 50~<60 | 58 (37.2) | |
| | 60~<70 | 50 (32.1) | |
| | ≥70 | 6 (3.7) | |
| Marital Status | Unmarried | 8 (5.2) | 54.68±9.42 |
| | Married | 142 (91.0) | |
| | Bereavement/Divorced/Remarried | 6 (3.8) | |
| Education | <Middle school | 7 (4.6) | 54.68±9.42 |
| | Middle school graduate | 20 (12.8) | |
| | High school graduate | 67 (42.9) | |
| | College graduate | 62 (39.7) | |
| Religion | Yes | 94 (60.3) | 54.68±9.42 |
| | No | 62 (39.7) | |
| Attitude towards religion | Important | 95 (60.9) | 54.68±9.42 |
| | Not important | 61 (39.1) | |
| Monthly income (US dollar) | <1,000 | 39 (25.0) | 54.68±9.42 |
| | 1,000~<2,000 | 26 (16.6) | |
| | 2,000~<3,000 | 33 (21.2) | |
| | ≥3,000 | 58 (37.2) | |
| Unemployed due to treatment | Yes | 59 (37.8) | 54.68±9.42 |
| | No | 97 (62.2) | |
| Length of treatment (years) | <2 | 64 (41.0) | 54.68±9.42 |
| | 2~<5 | 65 (41.7) | |
| | ≥5 | 27 (17.3) | |
| Difficulty in activities of daily living | No | 89 (57.0) | 54.68±9.42 |
| | Mild | 51 (32.7) | |
| | ≥Moderate | 16 (10.3) | |
| Cancer stage | Stage I | 37 (23.7) | 54.68±9.42 |
| | Stage II | 41 (26.3) | |
| | Stage III | 60 (38.5) | |
| | Stage IV | 18 (11.5) | |
| Treatment method | Surgery | 54 (34.6) | 54.68±9.42 |
| | Surgery and chemotherapy | 49 (31.4) | |
| | Surgery and chemoradiation | 28 (17.9) | |
| | Surgery after pre-operative chemoradiation | 25 (16.1) | |
| Having a stoma | Yes | 48 (30.2) | 54.68±9.42 |
| | No | 108 (69.8) | |
| Person caring of stoma (n=48) | Self | 30 (62.5) | 54.68±9.42 |
| | Spouse | 16 (33.3) | |
| | Descendant | 2 (4.2) | |
| Attending the stoma support group (n=48) | Yes | 4 (8.3) | 54.68±9.42 |
| | No | 44 (91.7) | |
| Posttraumatic growth | | | 2.97±1.11 |
| Health-promoting behavior | | | 2.70±0.43 |
| Psychosocial adjustment | | | 3.58±0.44 |

Table 2. Differences in the Level of Psychosocial Adjustment by General Characteristics

(N=156)

| Variables | Categories | Psychosocial adjustment | | |
|--|--|-------------------------|---------------|---------|
| | | M±SD | t or F (p) | Scheffe |
| Religion | Yes | 167.95±18.39 | 1.32 (.186) | |
| | No | 164.16±16.72 | | |
| Attitude towards religion | Important | 166.52±17.88 | 0.06 (.949) | |
| | Not important | 166.33±17.79 | | |
| Monthly income (US dollar) | <1,000 | 164.79±16.24 | 1.12 (.341) | |
| | 1,000~<2,000 | 163.04±12.97 | | |
| | 2,000~<3,000 | 165.33±19.01 | | |
| | ≥3,000 | 169.71±19.74 | | |
| Unemployed due to treatment | Yes | 162.68±15.78 | -2.08 (.039) | |
| | No | 168.73±18.61 | | |
| Length of treatment (yrs) | <2 ^a | 160.89±15.97 | 6.14 (.003) | a<b,c |
| | 2~5 ^b | 169.14±18.99 | | |
| | ≥5 ^c | 173.11±15.51 | | |
| Difficulty in activities of daily living | No ^a | 173.09±17.80 | 18.21 (<.001) | a>b,c |
| | Mild ^b | 158.75±11.76 | | |
| | ≥Moderate ^c | 154.00±17.95 | | |
| Treatment method | Surgery | 167.26±17.40 | 1.32 (.267) | |
| | Surgery and chemotherapy | 169.57±17.22 | | |
| | Surgery and chemoradiation | 162.54±15.76 | | |
| | Surgery after pre-operative chemoradiation | 162.92±21.22 | | |
| Having a stoma | Yes | 158.57±13.88 | -4.20 (<.001) | |
| | No | 169.83±18.26 | | |
| Attending the stoma support group (n=48) | Yes | 176.25±5.74 | 2.73 (.009) | |
| | No | 157.43±13.53 | | |

M=mean; SD=standard deviation.

Table 3. Correlations between Study Variables

(N=156)

| Variables | Length of treatment r (p) | Difficulty in activities of daily living r (p) | Having a stoma r (p) | Posttraumatic growth r (p) | Health promoting behavior r (p) |
|--|---------------------------|--|----------------------|----------------------------|---------------------------------|
| Difficulty in activities of daily living | -.35 (<.001) | | | | |
| Having a stoma | -.23 (.004) | .29 (<.001) | | | |
| Posttraumatic growth | .05 (.526) | -.15 (.064) | .04 (.611) | | |
| Health-promoting behavior | .13 (.105) | -.21 (.010) | -.06 (.496) | .46 (<.001) | |
| Psychosocial adjustment | .27 (.001) | -.42 (<.001) | -.29 (<.001) | .39 (<.001) | .49 (<.001) |

3. Factors associated with psychosocial adjustment

The correlation coefficient *r* between independent variables ranged from -.35 to .46. Psychosocial adjustment had significant positive correlations with health-promoting behavior (*r*=.49, *p*<.001), posttraumatic growth (*r*=.39, *p*<.001), and length of treatment (*r*=.27, *p*=.001), and negative correlations with difficulty in activities of daily living (*r*=-.42, *p*<.001) and having a stoma (*r*=-.29, *p*<.001) (Table 3).

Before conducting a multiple linear regression analysis, the result of the Durbin-Watson statistic was 1.88, indicating that there was no autocorrelation in the residuals. The tolerance limits were all above .10 and the variance inflation factors (VIFs) were all below 10 at 1.125~1.279. Thus, there was no multicollinearity issue between the independent variables.

The results of the multiple regression analysis showed that the regression model of psychosocial adjustment was significant (*F*=22.00, *p*<.001). The strongest factor associated with psycho-

Table 4. Factors Associated with Psychosocial Adjustment in Colorectal Cancer Survivors

(N=156)

| | Unstandardized coefficients | | Standardized coefficients | t | p |
|--|-----------------------------|------|---------------------------|-------|-------|
| | B | SE | β | | |
| Length of treatment | 2.11 | 1.63 | .09 | 1.29 | .198 |
| Difficulty in activities of daily living | -6.32 | 1.82 | -.24 | -3.47 | .001 |
| Having a stoma | -7.43 | 2.54 | -.19 | -2.92 | .004 |
| Posttraumatic growth | 0.16 | 0.06 | .20 | 2.91 | .004 |
| Health-promoting behavior | 0.37 | 0.08 | .33 | 4.67 | <.001 |
| F=22.00, $p<.001$, Adj R ² =.404 | | | | | |

SE=standard error.

social adjustment was health-promoting behavior ($\beta=.33$, $p<.001$), followed by difficulty in activities of daily living ($\beta=-.24$, $p=.001$), posttraumatic growth ($\beta=.20$, $p=.004$), and having a stoma ($\beta=-.19$, $p=.004$). The adjusted R square exhibited an explanatory power of 40.4% regarding psychosocial adjustment in colorectal cancer survivors (Table 4).

DISCUSSION

The present study attempted to investigate the factors associated with psychosocial adjustment in Korean colorectal cancer survivors among posttraumatic growth, health-promoting behavior, and general characteristics. The score of posttraumatic growth in this study was relatively low as 2.97 compared to 3.18 in individuals with gynecologic cancer [16] and 3.38 in those with general cancer [9]. This might result from the burden of caring for fecal incontinence or stoma following colorectal cancer surgery, along with a lack of support group activities in this study.

The level of health-promoting behavior in colorectal cancer survivors was relatively higher as 2.70 than the 2.61 of individuals with breast cancer [17], 2.65 of those with uterine cancer [16], and 2.34 of healthy adults [18]. These results may indicate that colorectal cancer survivors actively engage in health-promoting behaviors to overcome their illness and to prevent aftereffects more than other cancer survivors or healthy persons.

The level of psychosocial adjustment in this study was relatively higher as 3.58 compared to 3.05 of those with permanent colostomy [19]. This may indicate that colorectal cancer survivors after surgery more proactively try to cope, compared to those living with stoma. Nurses need to actively provide effective

solutions for patients during the adjustment period after surgery, because patients receiving authoritative information from a medical team rather than outside sources actively participated in the required management [20]. The level of psychosocial adjustment was lower in individuals within two years of treatments compared to those with a longer period of treatment. This result also indicates that patients in the early period of treatment may require more nursing interventions, whereas those in the long-term follow-up period need support for adjusting to society and regaining their careers.

Health-promoting behavior was the strongest factor facilitating psychosocial adjustment, followed by level of activities of daily living, posttraumatic growth, and not having a stoma. Nurses need to develop an intervention program that promotes health-promoting behaviors such as physical exercise and healthy lifestyles, because colorectal cancer survivors experience hardships during the treatment process. To reduce the health risks and challenges facing cancer survivors, interventions to encourage physical exercise and screening for cancer recurrence and secondary disease should be implemented [21]. Adopting a health-promoting approach based on empowerment is important, not just for improving care, but also for increasing perceptions of control that may reduce negative cancer beliefs [22].

In this study, the difficulty in activities of daily living decreased the level of psychosocial adjustment. Although there is a lack of studies examining psychosocial adjustment based on the level of activities of daily living in Korean colorectal cancer survivors, higher levels of physical, mental, and social discomfort related to cancer may decrease quality of life and psychosocial adjustment. A study of breast cancer survivors found that physical disability

was significantly associated with psychosocial well-being [23].

Posttraumatic growth was reported by colorectal cancer survivors and promoted their psychosocial adjustment in this study. Previous studies of breast cancer survivors also highlighted the importance of psychological intervention focusing on depressive symptoms, distress, and spirituality, which are associated with posttraumatic growth [24,25]. A study of patients with colorectal cancer identified resilience, coping, and importance of religion as influencing factors on posttraumatic growth [26]. The current methodological study of posttraumatic growth inventory for general cancer patients found that the new possibilities for cancer treatments and an active life were the strongest factors accounting for posttraumatic growth [27]. The development of medical technology will provide more opportunities. Hence, nursing interventions should include strategies for posttraumatic growth, to facilitate psychosocial adjustment.

Having a stoma is an important task in adapting to a changed appearance and lifestyle. For some colorectal cancer patients, the change of location of the excretory orifice to the surface of the abdomen and the sight of this excretion and stoma may be the biggest shock to them. The psychological stress from changes in the passageway of bowel movements, uncontrollable smells, and the noise of passing gas is a serious challenge for cancer survivors. Previous studies found that colorectal cancer survivors with colostomy had a lower quality of life and experienced depression and anxiety due to a diminished body image [28,29]. Because survivors with stomas experience hardships in adjusting to physical changes, psychosocial adjustment often takes a significant amount of time for them. Therefore, the comprehensive stoma programs are necessary for these survivors to obtain a positive body image and to restore themselves psychologically, as well as to reintegrate social relationships.

Nurses have responsibilities for encouraging colorectal cancer survivors to use positive life transformations to maintain an optimal level of health and to increase their level of psychosocial adjustment. Thus, nurses should have a comprehensive understanding of the possibilities for physical, psychological, and spiritual improvements, which one can accomplish through cancer management. In addition, nurses should develop intervention programs to explore efficient strategies that can increase continuous and systematic psychosocial adjustment. The study findings sug-

gest that more research is needed to identify and facilitate posttraumatic growth for colorectal cancer survivors, to increase the level of psychosocial adjustment.

CONCLUSION

Among Korean colorectal cancer survivors after surgery, the level of psychosocial adjustment increased through health-promoting behavior and posttraumatic growth; and decreased due to difficulty in activities of daily living and having a stoma. The psychosocial adjustment program for colorectal cancer survivors after surgery should include various nursing strategies to promote health-promoting behaviors and level of activities of daily living. As patients also experience posttraumatic growth, which was important for their survival and quality of life, nurses need to understand the nature of posttraumatic growth and develop intervention strategies for facilitating affirmative growth during colorectal cancer management. Medical technology also needs to develop new approaches related to stoma management, considering malodor control and appearance improvement for psychosocial adjustment.

Several limitations existed in this study. The study used a cross-sectional design, and the causal relationship between independent and dependent variables should be carefully inferred. However, the significant factors such as health-promoting behavior, difficulty in activities of daily living, posttraumatic growth, and having a stoma are theoretically ahead of psychosocial adjustment, and those factors may be useful for nursing interventions, to facilitate the psychosocial adjustment of colorectal cancer survivors. As we included participants with colorectal cancer without discriminating between colon cancer and rectal cancer, a further comparative study may be able to identify the characteristics of the relationships among variables between patients with colon cancer and those with rectal cancer.

CONFLICTS OF INTEREST

The authors declared no conflict of interest.

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