

ORIGINAL ARTICLE

NURSING INTERVENTIONS AND INFLUENCING SUBJECTIVE QOL IN PATIENTS AT DIFFERENT STAGES AFTER SURGERY FOR RECTAL CANCER

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Abstract We examined the factors influencing subjective quality of life (QOL) at different postoperative stages in 62 patients with rectal cancer who had undergone intersphincteric resection (ISR) or low anterior resection (LAR). I also examined nursing interventions aimed at improving the patients' subjective QOL. Subjective QOL was analyzed by using the Schedule for the Evaluation of the Individual Quality of Life – Direct Weighting (SEIQoL-DW).

In all patients (ISR and LAR groups combined), the mean SEIQoL-DW index values were 57.7 (patients less than 1 year after surgery), 66.6 (patients 1 to less than 2 years after surgery), and 68.7 (patients 2 or more years after surgery); the SEIQoL-DW index was significantly lower in patients in the first postoperative year than in those 2 or more years after surgery. These results suggest that subjective QOL is lowest during the first postoperative year and improves with time.

Analysis of components of QOL and their indices, as measured by SEIQoL-DW, revealed that family, hobbies (outdoor), health, friends, and hobbies (indoor) were the primary determinants of subjective QOL. Analysis of cues with low levels of satisfaction despite high importance in the SEIQoL-DW revealed that, to provide nursing interventions to improve subjective QOL, it is important to focus on interventions that 1) manage the dyschezia affecting the postoperative health of patients who have undergone LAR; and 2) provide lifestyle counseling to increase fulfillment in work or hobbies among patients who have undergone LAR.

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Key words: rectal cancer; ISR; LAR; subjective QOL.

Introduction

Low anterior resection (LAR) for rectal cancer has been performed widely since the 1980s¹⁾. In consideration of the quality of life (QOL) in patients with rectal cancer, recent years have seen an increase in the implementation of intersphincteric resection (ISR) for tumors in the anal canal, for which abdominoperineal resection was commonly adopted in the past²⁻⁵⁾. However, the widespread implementation of anal-preserving surgery, including ISR, has highlighted some clinical drawbacks, such as the development of various symptoms of postoperative dyschezia⁶⁻⁹⁾ and an associated decrease in QOL^{10, 11)}. Various studies

have evaluated surgical treatments from the perspective of dyschezia¹²⁾ and have analyzed anal function^{13, 14)} and patient QOL¹⁵⁾.

In the field of nursing, the primary research emphasis has been on patients with stomas; few nursing studies have focused on dyschezia in patients who have undergone anal-preserving surgery¹⁶⁻¹⁹⁾, and to our knowledge there have been no studies focusing on dyschezia in patients who have undergone ISR. The numbers of patients undergoing ISR or LAR are expected to increase in future with the rising incidence of colorectal cancer. In order to provide specific, continuous nursing care for these patients, it is important to identify potential determinants of subjective QOL during the postoperative period

and then to plan the best possible nursing interventions that could improve QOL.

Purpose

We examined subjective QOL and the factors influencing it at different postoperative stages in patients with rectal cancer who had undergone ISR or LAR. I also aimed to find nursing interventions that could improve subjective QOL.

Methods

1. Subjects

A total of 62 patients who underwent ISR or LAR for the treatment of rectal cancer consented to enroll in the study and completed interviews and the Schedule for the Evaluation of the Individual Quality of Life – Direct Weighting (SEIQoL-DW). Patients who were included in the study were in Curability Category A of the Japanese Classification of Colorectal Carcinoma²⁰⁾, with no signs of recurrence. Patients who have been receiving UFT or TS-1 as adjuvant chemotherapy after surgery were also included.

2. Methods for data sampling

An individual interview was performed with each study participant in accordance with the interview guide. One interview session lasted 40 to 88 min (average: 58 min); the interviewer took care to consider the condition of patients (e.g. tiredness). Patient data, including sex, age, employment status, family structure, date of operation, type of surgery, location of tumor, and disease stage, were acquired from the patients' medical records as basic attributes. The data acquired from the interviews comprised self-reports of defecation status and subjective QOL, as measured with SEIQoL-DW (Japanese version, Provisional Edition).

SEIQoL, which was developed by the research group of Ciarran O'Boyle and others at the Royal College of Surgeons in Ireland, is based

on a narrative approach. It is a semi-structured interview in which patients nominate the areas of life that they consider central to their QOL, without imposing external criteria, and then categorize them into 5 "cues". In each of these 5 cues, which represent the most important areas of life, the level of functioning is evaluated by using a visual analog scale (VAS) indicating the level of satisfaction with the cue.

Subsequently, patients are asked to assign the relative weight (percentage of importance) of each cue is then determined by using dedicated 5 colored disks.

Finally, the SEIQoL index is calculated as the sum of cue levels multiplied by cue weights. The range of index values is 0 to 100 points. With this method the data can be calculated as numerical values that may be able to provide a qualitative understanding of patients^{21, 22)}.

Other information obtained from patients was recorded in a field notebook. If patients expressed concern (e.g. about dyschezia) during the interviews, we intervened, in cooperation with physicians and outpatient nurses, to manage their condition.

3. Analytical methods

1) Evaluation of subjective QOL in ISR and LAR groups at different postoperative stages

The SEIQoL-DW index was obtained following the nomination of cues, assessment of cue levels, and weighting of cues by patients. We used One-way Factorial ANOVA Bonferroni correction or Kruskal-Wallis test to compare the SEIQoL-DW index values according to the type of surgery (ISR or LAR) and the postoperative stage by using SPSS 17.0 for Windows; *P*-values less than 0.05 were considered statistically significant.

Furthermore, to analyze the components of the SEIQoL-DW, each patient's cues were categorized following examination by researchers. For each category, average value of Level, Weight, Level × Weight were calculated and compared.

Table 1. Outline of subjects

	Total (n = 62) n (%)	ISR (n = 21) n (%)	LAR (n = 41) n (%)
Sex			
Male	41 (66.1)	15 (71.4)	26 (63.4)
Female	21 (33.9)	6 (28.6)	15 (36.6)
Median age (range)	63.0(43-80)	62.0(44-78)	63.0(43-80)
Postoperative period			
Less than 1 year	18 (29.0)	6 (28.6)	12 (29.3)
1 year to less than 2 years	18 (29.0)	4 (19.0)	14 (34.1)
2 years or more	26 (41.2)	11 (52.4)	15 (36.6)
Family structure			
Single	4 (6.5)	2 (9.5)	2 (4.9)
Living with a spouse	22 (35.5)	5 (23.8)	17 (41.5)
Two-generation household	30 (48.4)	9 (42.9)	21 (51.2)
Three-generation household	6 (9.7)	5 (23.8)	1 (2.4)
Employment status			
Company employee	12 (19.4)	2 (9.5)	10 (24.4)
Self-employed	6 (9.7)	4 (19.0)	2 (4.9)
Farmer	1 (1.6)	0 (0.0)	1 (2.4)
Medical worker	3 (4.8)	1 (4.8)	2 (4.9)
Unemployed	40 (64.5)	14 (66.7)	26 (63.4)

Postoperative stages were classified into less than 1 year; 1 year or more but less than 2 years; and 2 years or more after surgery, as used in a previous study²³⁾ of "The relationship between postoperative bowel dysfunction and self-esteem in the postoperative course period after low anterior resection for rectal cancer patients." The results for patients at each stage were then compared.

2) Comparison of dyschezia by postoperative stage

In the ISR and LAR groups, the presence of 7 symptoms associated with dyschezia (frequent defecation, irregular number of defecations, defecation only upon administration of oral cathartics, long time for bowel to settle down, frequent nocturnal defecation, fecal incontinence, and anal pain) that have been described in the previous study²³⁾ were compared among postoperative stages by using χ^2 test (Fisher's exact test).

4. Ethical considerations

Consent to participate in the study was

obtained from study participants, who were informed both orally and in writing of the purpose of the study, the methods used, our need to respect their free will, our guarantee of anonymity, and the intended publication of the study results. The study was approved by the research ethics committee of Aomori University of Health and Welfare (approval number: 1233), as well as by the ethical review boards of the medical institutions visited by the study participants.

Results

1. Outline of subjects (Table 1)

The total number of patients in the ISR group was 21 (15 men and 6 women) and that in the LAR group was 41 (26 men and 15 women), with median age, 63.0 years (range, 43-80 years). The numbers of patients with postoperative periods of less than 1 year, 1 year to less than 2 years, and 2 years or more were 18 (6 ISR and 12 LAR), 18 (4 ISR and 14 LAR), and 26 (11 ISR and 15 LAR), respectively. Four patients were single, 22 lived with a spouse, 30 lived in

Table 2. Comparison of SEIQoL-DW values by postoperative stage

Postoperative period	Total (n = 62)		ISR (n = 21)		LAR (n = 41)	
	n	Mean±SD ^{a)}	n	Median ^{b)} (range)	n	Median ^{b)} (range)
Less than 1 year	18	57.7 ± 16.6	6	59.2 (43.6-68.7)	12	59.3 (24.5-89.9)
1 year to less than 2 years	18	66.6 ± 14.1	4	64.9 (56.8-100.0)	14	66.0 (35.8-83.3)
2 years or more	26	68.7 ± 13.1	11	69.6 (53.8-92.8)	15	71.2 (39.0-81.6)

a): One-way Factorial ANOVA Bonferroni correction
b): Kruskal-Wallis test

**P* < 0.05 ns: not significant

two-generation households, and 6 lived in three-generation households. Twelve patients were company employees, 6 were self-employed, and there was 1 farmer, 3 medical workers, and 40 unemployed.

2. Comparison of SEIQoL-DW by postoperative stage (Table 2)

Comparison of SEIQoL-DW by postoperative stage yielded median SEIQoL-DW indexes of 59.3 (patients less than 1 year after surgery), 65.6 (patients 1 year to less than 2 years after surgery), and 70.4 (patients 2 or more years after surgery); patients in the first postoperative year had significantly lower SEIQoL-DW index values than those 2 or more years after surgery. Comparison of SEIQoL-DW index values within the ISR and LAR groups showed that median SEIQoL-DW index values were lowest in the first postoperative year, although statistical significance in the differences among values was not reached.

3. Details of SEIQoL index values in ISR and LAR groups at different postoperative stages

We examined the details of the SEIQoL index values in the ISR and LAR groups combined at different postoperative stages (Table 3).

To characterize the SEIQoL-DW, the cues were categorized and also their cues (number of cues), average value of Level, Weight, Level × Weight were calculated to compare at less than

1 year, 1 year to less than 2 years and 2 years or more groups.

Cues that were commonly chosen by all patients as a group at all postoperative stages were family, hobbies (outdoor), health, friends, and hobbies (indoor). Cues with relatively high weights but relatively low levels (implying high levels of importance but low levels of satisfaction) were health and work among patients in the first postoperative year; health among those in the second year; and health and gardening among those at 2 years or more.

In the ISR group, cues with relatively high weights but low levels were hobbies (indoor), health, and gardening among patients in the first postoperative year, and health and hobbies (outdoor) among those at 2 years or more (Table 4). In the LAR group these cues were work and hobbies (outdoor) among patients in the first postoperative year, health among those in the second postoperative year, and finances for those at 2 years or more (Table 5).

4. Comparison of dyschezia at different postoperative stages (Tables 6, 7, and 8)

There was no significant difference by surgery type at less than 1 year after surgery. At 1 year to less than 2 years after surgery, [Frequently defecation] [Irregular defecation] [Fecal incontinence] is significantly higher in ISR, and in 2 years or more after surgery, [Irregular defecation] [Frequent nocturnal

Table 3. SEIQoL index values in the ISR and LAR groups combined at different postoperative stages

Postoperative period	Category	Cues	Level*	Weight*	Level ×* Weight
Less than 1 year (n=18)	Family	18	68.9 ± 23.8	35.4 ± 18.1	23.0 ± 12.3
	Hobbies (outdoor)	14	39.4 ± 35.7	17.4 ± 11.4	9.3 ± 10.3
	Health	10	48.6 ± 14.4	20.5 ± 9.4	10.3 ± 6.3
	Friends	7	71.3 ± 22.8	20.1 ± 7.6	13.9 ± 6.1
	Work	5	13.0 ± 19.9	34.4 ± 27.2	8.2 ± 12.2
	Hobbies (indoor)	5	54.6 ± 33.8	18.6 ± 15.7	11.5 ± 11.1
	Personal relationships	5	67.2 ± 29.0	17.0 ± 10.8	12.9 ± 10.6
	Gardening	4	86.0 ± 19.8	13.0 ± 4.2	11.6 ± 6.2
	Finances	2	20.0 ± 18.4	7.0 ± 0.0	1.4 ± 1.3
	Relatives	2	79.0 ± 1.4	28.5 ± 2.1	22.5 ± 1.3
	Alcohol intake	2	24.0 ± 33.9	9.5 ± 3.5	1.7 ± 2.4
1 year to less than 2 years (n=18)	Family	17	72.3 ± 18.2	36.3 ± 9.5	26.0 ± 9.5
	Hobbies (outdoor)	15	63.9 ± 22.0	15.0 ± 10.6	9.3 ± 6.8
	Hobbies (indoor)	9	54.6 ± 18.9	14.0 ± 9.7	8.7 ± 8.5
	Lifestyle	4	82.0 ± 12.0	22.8 ± 2.8	18.5 ± 2.4
	Health	4	46.0 ± 41.3	35.0 ± 10.7	15.2 ± 11.7
	Relatives	4	58.5 ± 22.9	25.0 ± 8.8	13.5 ± 4.4
	Friends	4	59.0 ± 13.5	16.5 ± 5.1	9.8 ± 3.5
	Work	2	76.5 ± 6.4	24.5 ± 2.1	18.7 ± 0.1
	Personal relationships	2	46.0 ± 1.4	8.0 ± 1.4	3.7 ± 0.5
2 years or more (n=26)	Family	26	70.6 ± 14.3	33.5 ± 13.9	24.4 ± 12.2
	Hobbies (outdoor)	15	64.5 ± 20.6	13.5 ± 5.9	9.4 ± 6.4
	Friends	14	70.9 ± 19.2	19.0 ± 8.5	13.6 ± 8.0
	Work	12	67.0 ± 21.8	29.3 ± 11.6	22.2 ± 12.9
	Hobbies (indoor)	12	67.8 ± 21.5	16.5 ± 11.7	12.0 ± 9.3
	Health	10	50.7 ± 20.2	28.7 ± 7.4	14.2 ± 6.1
	Relatives	10	75.8 ± 20.3	17.8 ± 8.4	14.6 ± 9.3
	Lifestyle	7	66.7 ± 25.2	15.6 ± 4.7	10.8 ± 6.7
	Finances	4	72.5 ± 30.4	24.5 ± 12.8	16.1 ± 9.3
	Pets	3	58.0 ± 30.8	19.7 ± 9.9	10.1 ± 3.7
	Personal relationships	2	61.0 ± 8.5	15.0 ± 5.7	9.4 ± 4.7
	Gardening	2	50.0 ± 70.7	20.5 ± 17.7	16.5 ± 23.3
	Eating meals	2	88.0 ± 17.0	24.0 ± 5.7	20.6 ± 0.9

*: Values mean average ± standard deviation

defecation] [Fecal incontinence] was significantly more in the ISR.

Discussion

1. Subjective QOL in the ISR and LAR groups at different postoperative stages, and influencing factors

Subjective QOL in each of the ISR and LAR groups separately was lowest in patients in the first postoperative year, although the differences were not significant. Among all patients combined, subjective QOL was significantly lower in those in the first postoperative year than in those

at 2 or more years after surgery, suggesting that subjective QOL improves with time. These results are similar to those obtained in a previous study²³⁾ that included only patients who had undergone LAR.

As determined from the SEIQoL-DW index values in the ISR and LAR groups at different postoperative stages, the main factors that influence subjective QOL are family, hobbies (outdoor), health, friends, and hobbies (indoor), regardless of the postoperative period. In particular, family was nominated as a cue by the majority of patients and was highly weighted, suggesting that it is a factor essential

Table 4. SEIQoL index values in the ISR group at different postoperative stages

Postoperative period	Category	Cues	Level*	Weight*	Level ×* Weight
Less than 1 year (n=6)	Family	6	63.8 ± 18.3	42.7 ± 21.8	28.1 ± 16.5
	Hobbies (outdoor)	5	24.8 ± 23.0	11.0 ± 10.7	3.8 ± 4.7
	Hobbies (indoor)	4	43.3 ± 25.8	20.8 ± 17.2	11.9 ± 12.8
	Health	3	41.0 ± 12.5	20.7 ± 10.1	8.3 ± 5.0
	Personal relationships	2	62.5 ± 27.6	23.0 ± 17.0	16.7 ± 16.9
	Gardening	2	48.0 ± 1.4	25.0 ± 7.1	12.1 ± 3.7
1 year to less than 2 years (n=4)	Hobbies (outdoor)	4	50.5 ± 16.5	9.3 ± 2.2	4.9 ± 2.6
	Family	2	64.0 ± 5.7	39.0 ± 4.2	25.1 ± 4.9
	Hobbies (indoor)	2	62.5 ± 21.8	27.5 ± 13.4	18.7 ± 14.4
2 years or more (n=11)	Family	10	74.6 ± 14.7	34.2 ± 11.8	25.3 ± 10.0
	Relatives	6	76.5 ± 20.5	16.7 ± 9.7	13.9 ± 9.9
	Friends	6	71.7 ± 23.3	18.0 ± 4.3	13.0 ± 5.3
	Health	6	43.2 ± 21.8	29.8 ± 9.0	12.7 ± 7.0
	Work	4	67.0 ± 22.9	29.3 ± 15.9	22.2 ± 19.3
	Hobbies (indoor)	4	72.0 ± 32.5	10.8 ± 4.6	8.1 ± 5.3
	Lifestyle	3	88.7 ± 19.6	17.0 ± 6.2	15.9 ± 8.2
	Hobbies (outdoor)	3	49.0 ± 40.8	22.8 ± 11.3	14.3 ± 13.9
	Finances	2	93.5 ± 9.2	22.0 ± 11.3	21.1 ± 12.6
	Eating meals	2	88.0 ± 17.0	24.0 ± 5.7	20.6 ± 0.9
	Personal relationships	2	61.0 ± 8.5	15.0 ± 5.7	9.4 ± 4.7

*: Values mean average ± standard deviation

for subjective QOL. Among the 62 study participants, only 4 (6.5%) were single, and over 90% were living with family. Moriguchi et al. defined family as “a group composed of a small number of close relatives such as husband and wife, parent and child, and siblings as principal members, who are closely tied each other emotionally and pursue each other’s well-being²⁴⁾.” There are 5 functions of family, namely emotional, social, reproductive, economic, and healthcare²⁵⁾. According to the Japanese Cabinet Office’s 2007 Monitoring Survey of Living Conditions of the People²⁶⁾, more than 60% of survey respondents consider home as “a place to have quality family time” or “a place to rest and relax;” people therefore have a strong tendency to seek rest and relaxation among family. The survey also showed that more than half of respondents considered family to be important. In our study, patients considered family particularly important for QOL, possibly because they sought mental support from family after the physical and emotional turmoil they had experienced through

surgical treatment for rectal cancer. In contrast, the patients, whose average age was 60 years or more, sought emotional support from friends if they did not have a spouse to live with, because in this case friends played the same close role as family.

An interest in hobbies suggests emotional improvement in patients, because fulfillment through hobbies could help to promote positive thinking. Outdoor hobbies, in particular, expand the range of diversions that might help patients’ activity to recover to their pre-surgery levels.

The health of postoperative patients can be affected by both organic and functional factors, and the nature of the disease means that cancer recurrence always remains a possibility. Our patients, in particular, had issues with postoperative dyschezia. QOL of patients was the lowest during the first postoperative year, when the rates of occurrence of various symptoms of dyschezia were high, suggesting that dyschezia is a major determinant of subjective QOL. The rate of irregular defecation (one of the symptoms

Table 5. SEIQoL index values in the LAR group at different postoperative stages

Postoperative period	Category	Cues	Level*	Weight*	Level ×* Weight
Less than 1 year (n=12)	Family	12	71.5 ± 26.5	31.8 ± 15.7	20.4 ± 28.6
	Hobbies (outdoor)	9	47.4 ± 40.0	21.0 ± 10.6	12.3 ± 11.5
	Friends	7	71.3 ± 22.8	20.1 ± 7.6	13.9 ± 6.1
	Health	7	51.9 ± 14.7	20.4 ± 9.9	11.2 ± 7.0
	Work	4	16.3 ± 21.4	40.3 ± 27.5	10.2 ± 13.1
	Personal relationships	3	70.3 ± 35.5	13.0 ± 5.3	10.4 ± 7.5
	Gardening	2	86.0 ± 19.8	13.0 ± 4.2	11.6 ± 6.2
	Finances	2	20.0 ± 18.4	7.0 ± 0.0	1.4 ± 1.3
1 year to less than 2 years (n = 14)	Family	14	73.4 ± 19.1	35.9 ± 10.0	26.1 ± 10.0
	Hobbies (outdoor)	14	67.8 ± 22.4	16.6 ± 11.5	10.5 ± 7.2
	Hobbies (indoor)	9	52.9 ± 19.4	11.0 ± 6.3	6.5 ± 5.9
	Lifestyle	4	82.0 ± 12.0	22.8 ± 2.8	18.5 ± 2.4
	Health	4	46.0 ± 41.3	35.0 ± 10.7	15.2 ± 11.7
	Relatives	4	58.5 ± 22.9	25.0 ± 8.8	13.5 ± 4.4
	Friends	4	59.0 ± 13.5	16.5 ± 5.1	9.8 ± 3.5
	Work	2	76.5 ± 6.4	24.5 ± 2.1	18.7 ± 0.1
2 years or more (n = 15)	Personal relationships	2	46.0 ± 1.4	8.0 ± 1.4	3.7 ± 0.5
	Family	15	68.1 ± 14.0	33.1 ± 15.5	23.7 ± 13.8
	Hobbies (outdoor)	12	59.0 ± 17.2	13.7 ± 6.0	8.8 ± 5.9
	Friends	8	70.4 ± 17.3	19.8 ± 11.0	14.1 ± 9.9
	Work	8	56.5 ± 22.0	18.1 ± 7.5	11.4 ± 7.5
	Hobbies (indoor)	7	64.3 ± 16.9	20.4 ± 14.0	14.6 ± 11.0
	Health	4	62.0 ± 11.9	27.0 ± 5.0	16.6 ± 4.3
	Relatives	4	74.8 ± 23.2	19.5 ± 7.0	15.8 ± 9.5
	Lifestyle	4	50.3 ± 12.9	14.5 ± 3.9	6.9 ± 0.8
	Pets	2	62.0 ± 42.4	23.0 ± 11.3	11.9 ± 2.7
	Finances	2	51.5 ± 30.4	27.0 ± 18.4	11.1 ± 1.3

*: Values mean average ± standard deviation

of dyschezia) was significantly higher in the ISR group than in the LAR group, regardless of postoperative stage, suggesting that dyschezia has a large influence on QOL in patients who undergo ISR. Nakamura *et al.* have shown that, after LAR, patients can develop dysfunction of the large intestine—particularly a decrease in movement of the left colon distal to the site of anastomosis—owing to parasympathetic nerve damage, resulting in slow colonic transit of the stool²⁷. Transection of the vagus nerve during ISR or LAR surgery also causes reduced contractile movements in the area from part way down the transverse colon to the descending colon, resulting in chronic constipation. Because slow colonic transit prolongs the time between defecations, daily bowel movements are disrupted, causing changes in movement capacity

and stool characteristics. Defecation becomes irregular, thus affecting daily life. Based on the above results, it is considered that the ISR was more difficult than the LAR in daily life because irregular defecation and fecal incontinence after one year or more after surgery.

2. Nursing interventions to improve subjective QOL in patients after surgery for rectal cancer

Given that a high SEIQoL-DW index implies a high subjective QOL, those cues for which the satisfaction levels of patients were low despite having high weights (i.e. high importance) would be the most likely to merit nursing interventions aimed at improving satisfaction levels and thus improving QOL. The cues with low levels of satisfaction despite high weights in patients overall in the less than 1 year were work and

Table 6. Comparison of dyschezia between the ISR and LAR groups in the less than 1 year after surgery

		ISR (n = 6)	LAR (n = 12)	<i>P</i> -value*
		n (%)	n (%)	
Frequent defecation	Present	5 (83.3)	4 (33.3)	0.066
	Absent	1 (16.7)	8 (66.7)	
Irregular defecation	Present	5 (83.3)	4 (33.3)	0.066
	Absent	1 (16.7)	8 (66.7)	
Defecation only upon administration of oral cathartics	Present	5 (83.3)	11 (91.7)	0.569
	Absent	1 (16.7)	1 (8.3)	
Long time for bowel to settle down	Present	5 (83.3)	6 (50.0)	0.199
	Absent	1 (16.7)	6 (50.0)	
Frequent nocturnal defecation	Present	2 (33.3)	1 (8.3)	0.245
	Absent	4 (66.7)	11 (91.7)	
Fecal incontinence	Present	4 (66.7)	2 (16.7)	0.057
	Absent	2 (33.3)	10 (83.3)	
Anal pain	Present	3 (50.0)	5 (41.7)	0.569
	Absent	3 (50.0)	7 (58.3)	

*: Fisher's exact test

Table 7. Comparison of dyschezia between the ISR and LAR groups in the 1 year to less than 2 years after surgery

		ISR (n = 4)	LAR (n = 14)	<i>P</i> -value*
		n (%)	n (%)	
Frequent defecation	Present	4 (100.0)	5 (35.7)	0.041
	Absent	0 (0.0)	9 (64.3)	
Irregular defecation	Present	4 (100.0)	5 (35.7)	0.041
	Absent	0 (0.0)	9 (64.3)	
Defecation only upon administration of oral cathartics	Present	0 (0.0)	3 (21.4)	0.446
	Absent	4 (100.0)	11 (78.6)	
Long time for bowel to settle down	Present	2 (50.0)	5 (35.7)	0.515
	Absent	2 (50.0)	9 (64.3)	
Frequent nocturnal defecation	Present	2 (50.0)	1 (7.1)	0.108
	Absent	2 (50.0)	13 (92.9)	
Fecal incontinence	Present	3 (75.0)	2 (14.3)	0.044
	Absent	1 (25.0)	12 (85.7)	
Anal pain	Present	1 (25.0)	4 (28.6)	0.701
	Absent	3 (75.0)	10 (71.4)	

*: Fisher's exact test

health. At this stage, gardening, hobbies (indoor), and health were cues within the ISR group, and work and hobbies (outdoor) were cues in the LAR group. In patients overall in the 1 year to less than 2 years and at 2 years or more after surgery, health remained a cue with a low level of satisfaction despite a high weight. In the ISR group, the level of satisfaction with health was low during the less than 1 year after surgery and at 2 years or more after surgery; this might have reflected the presence of severe fecal

incontinence. In contrast, given that subjective QOL in the LAR group was influenced by fulfillment through hobbies or a return to work, instead of by dyschezia, during the 1 year to less than 2 years after surgery, any decrease in QOL in the LAR group was likely due to an inability to return to normal daily activities. Health became a determinant of QOL in LAR patients in the 1 year to less than 2 years after surgery, indicating that some patients were still having health problems (poor bowel movements), which

Table 8. Comparison of dyschezia between the ISR and LAR groups in the 2 years or more after surgery

		ISR (n = 11)		LAR (n = 15)		<i>P</i> -value*
		n	(%)	n	(%)	
Frequent defecation	Present	5	(45.5)	2	(13.3)	0.085
	Absent	6	(54.5)	13	(86.7)	
Irregular defecation	Present	5	(45.5)	1	(6.7)	0.032
	Absent	6	(54.5)	14	(93.3)	
Defecation only upon administration of oral cathartics	Present	3	(27.3)	5	(33.3)	0.543
	Absent	8	(72.7)	10	(66.7)	
Long time for bowel to settle down	Present	5	(45.5)	3	(20.0)	0.169
	Absent	6	(54.5)	12	(80.0)	
Frequent nocturnal defecation	Present	4	(36.4)	0	(0.0)	0.022
	Absent	7	(63.6)	15	(100.0)	
Fecal incontinence	Present	4	(36.4)	0	(0.0)	0.022
	Absent	7	(63.6)	15	(100.0)	
Anal pain	Present	3	(27.3)	4	(26.7)	0.655
	Absent	8	(72.7)	11	(73.3)	

*: Fisher's exact test

influenced their QOL, more than a year after LAR.

These results suggest that it is important for patients who undergo ISR to receive interventions to manage the dyschezia affecting their health—particularly issues such as fecal incontinence and irregular bowel movements—throughout the postoperative period, as well as to help them to increase their sense of fulfillment through hobbies. For patients who undergo LAR, it is important to provide interventions focusing on lifestyle counseling to increase fulfillment through work or hobbies and thus help with return to normal daily activities. For those with severe fecal incontinence, providing concurrent interventions to manage the condition is also necessary.

Study limitations and future perspectives

We assessed subjective QOL in patients with rectal cancer at different postoperative stages, and we determined the factors influencing QOL and the nursing interventions required. The small sample size limited the comparisons by postoperative stage within the ISR and LAR groups. In future, we need a larger sample size to increase the accuracy of the data. In addition,

combining the SEIQoL-DW method with other scaling analyses would improve the precision and accuracy of the analysis of subjective QOL.

Conclusions

We assessed subjective QOL according to postoperative stage in 62 patients with rectal cancer who underwent ISR or LAR, and we revealed the factors influencing subjective QOL. We also determined which nursing interventions would help to improve subjective QOL. We reached the following conclusions:

1. Subjective QOL in all patients (ISR and LAR groups combined) was significantly lower in the first postoperative year than at 2 or more years after surgery, suggesting that subjective QOL improves with time.
2. The primary factors influencing subjective QOL were family, hobbies (outdoor), health, friends, and hobbies (indoor).
3. To provide nursing interventions to improve subjective QOL in patients who have undergone ISR, it is important to focus on interventions that manage the dyschezia affecting patient health throughout the postoperative period. For patients who have undergone LAR, in-

terventions providing lifestyle counseling to increase fulfillment through work or hobbies are essential.

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