

Association between satisfaction and quality of life after robot-assisted radical prostatectomy: a 1-year longitudinal study

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Abstract

Aim: This study aimed to investigate the association between treatment satisfaction and both general and cancer-specific quality of life (QOL) in patients who underwent robot-assisted radical prostatectomy (RARP).

Methods: A total of 108 patients who underwent RARP were surveyed using a questionnaire preoperatively and 1, 3, 6, 9, and 12 months postoperatively. The outcomes were treatment satisfaction, general health-related and cancer-specific QOL. Modified Poisson regression analysis with robust error variance was performed to examine the association between the QOL and treatment satisfaction at 12 months.

Results: More than half of the participants were satisfied throughout the postoperative follow-up period, but a certain number of men were dissatisfied. In multivariable analysis, mental component summary was significantly associated with treatment satisfaction at 12 months (prevalence ratio = 1.04; 95 % confidence interval = 1.00–1.08; $p = 0.049$); however, urinary and sexual function were not associated with treatment satisfaction.

Conclusion: Psychological factors may be associated with patient satisfaction after RARP. Care and attention to mental health may be important for improving treatment satisfaction. Identifying the factors associated with dissatisfaction and developing interventions for this group are clinically important in the future.

Key Words

robot-assisted radical prostatectomy; treatment satisfaction; quality of life; prostate cancer

Introduction

Prostate cancer is the most commonly diagnosed malignancy in Japanese men, with the number of patients increasing annually¹⁾. Robot-assisted radical prostatectomy (RARP) is a widely established standard surgical treatment for localized prostate cancer²⁾. Although RARP is expected to be less invasive than conventional open surgery³⁾, postoper-

ative complications, such as urinary and sexual dysfunctions, remain significant concerns that affect patients' quality of life (QOL)⁴⁾. In recent years, cancer treatment outcomes have been evaluated not only by survival rates and oncological outcomes but also by patients' subjective assessments, including QOL and treatment satisfaction as patient-reported outcomes^{5, 6)}. QOL assessment is crucial, particularly in the treatment of localized

prostate cancer, and has become a treatment endpoint in addition to conventional primary oncological outcomes⁷⁾. Therefore, treatment satisfaction in patients undergoing RARP can be considered a comprehensive patient-reported evaluation reflecting multiple aspects of treatment outcomes, including oncological outcomes, adverse events, and QOL. Accordingly, understanding the relationship between QOL and treatment satisfaction may provide important insights into patient-centered care.

Previous studies on treatment satisfaction after RARP have primarily examined its association with cancer-specific QOL, particularly urinary and sexual functions. A previous study reported that treatment satisfaction at 12 months post-RARP was significantly associated with urinary function⁸⁾. In addition, multiple studies have demonstrated that the severity of postoperative urinary incontinence and erectile dysfunction influences treatment satisfaction and decisional regret^{9,10)}. These findings suggest that improvements in functional outcomes are important to enhance patient satisfaction. However, the association between treatment satisfaction and general health-related QOL (HRQOL) has not been sufficiently examined. The general HRQOL provides a comprehensive assessment of multidimensional health status, including physical, mental, and social health. Treatment satisfaction is mainly determined by personal perception rather than the objective status of functional outcomes, such as urinary and sexual function¹¹⁾. Urinary and sexual functions are not related to treatment satisfaction¹²⁾. Furthermore, regret after prostate cancer treatment is associated with preoperative mental health, depression, anxiety, and social support¹³⁻¹⁵⁾. Therefore, to understand treatment satisfaction, it is important to clarify the factors associated with satisfaction from the perspectives of both cancer-specific QOL and general HRQOL.

Nurses are continuously involved with patients from the perioperative period through post-discharge follow-up and provide comprehensive sup-

port; thus, nursing plays a significant role in improving patient satisfaction. Clarifying the factors influencing treatment satisfaction will provide fundamental knowledge for the delivery of effective patient support. Furthermore, in addition to the conventional care for functional impairments centered on urinary care, this study provides insights into patient support from a new perspective aimed at improving satisfaction.

Therefore, this study aimed to clarify the association between treatment satisfaction and general and cancer-specific QOL in patients following RARP.

Methods

Study Design and Data Collection

This longitudinal study followed patients for 1 year after RARP. Patients with prostate cancer who underwent RARP at A University Hospital in Japan were enrolled. Adult men with prostate cancer who were able to communicate independently were included in this study. Patients scheduled for postoperative care at a different hospital were excluded, as this would preclude a standardized follow-up assessment. Six self-administered questionnaires were completed by each patient during the follow-up period at the following time points: preoperatively (1–4 days before surgery) and 1, 3, 6, 9, and 12 months postoperatively. During the preoperative survey, patient characteristics and clinical data were obtained from electronic medical records, and postoperative surveys were conducted during routine outpatient visits. Participant recruitment was conducted between May 2016 and October 2017, and data collection was completed in October 2018.

Outcome Measures

Expanded Prostate Cancer Index Composite (EPIC)

The Expanded Prostate Cancer Index Composite

(EPIC) was used to measure prostate cancer-specific QOL and treatment satisfaction¹⁶⁾. The EPIC is considered the most appropriate specific measure for assessing QOL associated with treatment and symptoms in patients with prostate cancer. The EPIC is composed of 50 questions and consists of four domains: urinary, bowel, sexual, and hormonal. Each domain is scored between 0 and 100, with higher scores indicating better QOL. Treatment satisfaction was assessed using a single question from the EPIC instrument: "Overall, how satisfied are you with the treatment you received for your prostate cancer?" The participants responded on a 5-point Likert scale: extremely satisfied, satisfied, uncertain, dissatisfied, and extremely dissatisfied. Treatment satisfaction is also scored on a scale from 0 to 100, with higher scores indicating greater satisfaction. A Japanese version of the EPIC has also been developed, and its reliability and validity have been verified¹⁷⁾ (used with permission from the copyright holder).

SF8 Health Survey (SF-8)

The 8-Item Short-Form Health Survey (SF-8) was used to measure general HRQOL¹⁸⁾. The SF-8 is designed to assess general HRQOL across eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. Each domain is measured using a single item, and the physical component summary scores and mental component summary scores are calculated based on these domains. The scores were standardized using Japanese population norms to provide a mean score of 50, with higher scores corresponding to better QOL. A Japanese version of the SF-8 has also been developed, and its reliability and validity have been verified¹⁸⁾ (used with permission from the copyright holder).

Characteristics and Clinical Data

Age, marital status, employment, nerve-sparing,

preoperative prostate-specific antigen, D'Amico risk classification, and medical history were investigated.

Data Analysis

Participants who dropped out after surgery were excluded from the analysis.

Participant characteristics and clinical data are presented as median and interquartile range for continuous variables and as numbers (%) for categorical variables.

Changes in treatment satisfaction over time were analyzed using the Friedman test. Changes in SF-8 and EPIC scores over time were also analyzed using the Friedman test, with the Bonferroni correction applied for multiple comparisons between preoperative and postoperative scores.

Modified Poisson regression analysis with robust error variance was performed to examine the association between the QOL and treatment satisfaction at 12 months. Treatment satisfaction was dichotomized into satisfied ("extremely satisfied" and "satisfied") and dissatisfied ("uncertain," "dissatisfied," and "extremely dissatisfied") groups as the dependent variable. The SF-8 and EPIC scores were examined as independent variables. First, a univariable analysis was performed for each variable. For the multivariable analysis, owing to multicollinearity among the SF-8 subscales (maximum variance inflation factor [VIF] = 11.4), the Physical and Mental component summaries were used instead of individual subscales. For EPIC, both Urinary and Hormonal summaries were significant in the univariable analysis. Given that urinary dysfunction is the most clinically important and persistent complication following radical prostatectomy and that Urinary summary showed a smaller p-value, Urinary summary was selected considering the need to ensure adequate events per variable (Model 1). To examine the potential influence of the Hormonal summary, a four-variable model was also examined (Model 2). Results are present-

ed as estimate prevalence ratios (PRs) with 95 % confidence intervals (95 % CIs).

Statistical significance was set at $p < 0.05$. All statistical analyses were performed using SPSS version 29.

Ethical Considerations

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Review Committee of Yamagata University Faculty of Medicine (approval number: 28-27). All participants provided written informed consent prior to participating in the initial survey.

Results

Participant Characteristics

A total of 108 patients participated in this study, and 100 (92.6 %) were included in the analysis, excluding eight who dropped out. The mean age of the participants was 67.0 years. Ninety-four (94.0 %) participants had spouses, and 55 (55.0 %) were employed. Seventeen (17.0 %) participants underwent

nerve-sparing surgery. Ten (10.0 %) participants were classified as having low risk, 42 (42.0 %) as having intermediate risk, and 48 (48.0 %) as having high risk (Table 1).

Changes in Treatment Satisfaction

The proportion of participants who responded “extremely satisfied” or “satisfied” was more than half at each time point: 53.0 % at 1 month, 52.0 % at 3 months, 59.0 % at 6 months, 56.0 % at 9 months, and 62.0 % at 12 months postoperatively. The proportion of participants reporting being “extremely dissatisfied” or “dissatisfied” remained low throughout the postoperative period, ranging from 4.0 % to 10.0 % (Figure 1). The treatment satisfaction score at all five postoperative survey points was 75 (50–75), with no significant differences observed among the time points ($p = 0.330$).

Changes in SF-8 and EPIC Scores

All SF-8 subscales showed significant changes over time ($p < 0.001$). At 1 month postoperatively, all subscales except Mental health were significantly lower than the preoperative values. Most subscale scores recovered to preoperative levels by 3 or 6 months postoperatively. Mental health was significantly better than the preoperative values at 6 and 12 months postoperatively. The SF-8 summary scores also showed significant changes over time ($p < 0.001$); the physical component summary was significantly lower than the preoperative scores at 1 and 3 months, whereas the mental component summary was significantly higher at 12 months (Table 2).

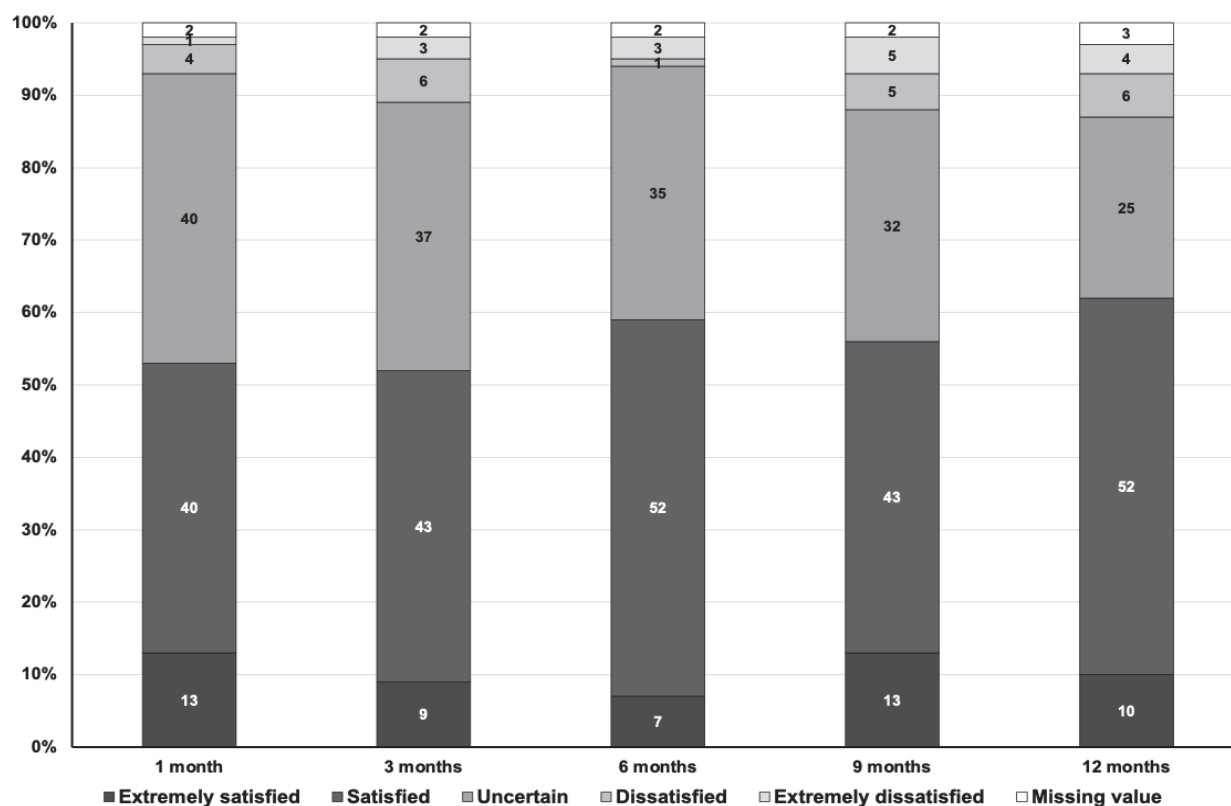
All EPIC domains showed significant changes over time ($p < 0.001$). The Urinary domain substantially decreased 1 month postoperatively and did not recover to preoperative levels by 12 months ($p < 0.05$). The Bowel domain temporarily decreased at 1 month but subsequently recovered. The Sexual domain also substantially decreased at 1 month and remained low at 12 months ($p < 0.01$). The

Table 1
Characteristics and clinical data

	<i>N=100</i>
Age, years	
Mean \pm SD	67.0 \pm 5.6
Spouse, n (%)	
Yes	94 (94.0%)
Employed, n (%)	
Yes	55 (55.0%)
Nerve sparing, n (%)	
Yes	17 (17.0%)
PSA level, ng/ml	
Mean \pm SD	9.0 \pm 5.6
D'Amico risk classification, n (%)	
Low	10 (10.0%)
Intermediate	42 (42.0%)
High	48 (48.0%)
Medical history, n (%)	
Yes	56 (56.0%)

PSA, prostate-specific antigen

Figure 1
The change of treatment satisfaction



Note. Treatment satisfaction questionnaire item of the EPIC included “overall, how satisfied are you with the treatment you received for your prostate cancer?” Participants responded on a 5-point Likert scale: extremely satisfied, satisfied, uncertain, dissatisfied, and extremely dissatisfied. The numbers in the bar graph represent the number of participants. No significant differences were observed among time points (Friedman test, $p = 0.330$).

Hormonal domain showed significant changes over time; however, no significant differences were observed between any time point and the preoperative scores (Table 2).

Association Between Treatment Satisfaction and Quality of Life

Modified Poisson regression analysis with robust error variance was performed to examine the association between treatment satisfaction and QOL at 12 months. Sixty-two (63.9 %) patients were in the satisfied group, and 35 (36.1 %) were in the dissatisfied group.

In univariable analysis, among SF-8 subscales,

role physical (PR = 1.05; 95 % CI = 1.01–1.08; $p = 0.005$), bodily pain (PR = 1.04; 95 % CI = 1.01–1.09; $p = 0.029$), general health (PR = 1.04; 95 % CI = 1.02–1.07; $p < 0.001$), vitality (PR = 1.04; 95 % CI = 1.01–1.06; $p = 0.008$), social functioning (PR = 1.04; 95 % CI = 1.01–1.07; $p = 0.004$), role emotional (PR = 1.08; 95 % CI = 1.04–1.13; $p < 0.001$), and mental health (PR = 1.07; 95 % CI = 1.03–1.11; $p < 0.001$) were significantly associated with treatment satisfaction. For SF-8 summary scores, both physical component summary (PR = 1.04; 95 % CI = 1.01–1.08; $p = 0.018$) and mental component summary (PR = 1.06; 95 % CI = 1.02–1.09; $p = 0.002$) were significant. For EPIC, Urinary summary (PR = 1.02;

Table 2
The change in SF-8 and EPIC scores

	Preoperative Median (IQR)	1 month Median (IQR)	3 months Median (IQR)	6 months Median (IQR)	9 months Median (IQR)	12 months Median (IQR)	P-value
SF-8 subscale scores							
Physical functioning	53.5 (47.8-53.5)	41.5 (41.5-47.8)**	47.8 (41.5-53.5)	47.8 (41.5-53.5)	47.8 (47.8-53.5)	47.8 (47.8-53.5)	< 0.001
Role physical	54.1 (47.4-54.1)	40.7 (40.7-47.4)**	47.4 (40.7-54.1)	47.4 (47.4-54.1)	47.4 (47.4-54.1)	47.4 (47.4-54.1)	< 0.001
Bodily pain	60.4 (52.5-60.4)	52.5 (46.1-52.5)**	52.5 (46.1-60.4)	60.4 (52.5-60.4)	60.4 (52.5-60.4)	60.4 (52.5-60.4)	< 0.001
General health	50.3 (44.5-53.7)	50.3 (40.4-50.3)**	50.3 (50.3-50.3)	50.3 (50.3-58.5)	50.3 (50.3-58.5)	50.3 (50.3-58.5)	< 0.001
Vitality	53.7 (44.5-53.7)	44.5 (44.5-53.7)**	44.5 (44.5-53.7)	53.7 (44.5-53.7)	53.7 (44.5-53.7)	53.7 (44.5-53.7)	< 0.001
Social functioning	55.1 (45.6-55.1)	37.7 (37.7-45.6)**	45.6 (37.7-55.1)*	55.1 (45.6-55.1)	55.1 (45.6-55.1)	50.4 (45.6-55.1)	< 0.001
Role emotional	48.0 (48.0-54.2)	42.2 (42.2-48.0)**	48.0 (42.2-54.2)	48.0 (48.0-54.2)	54.2 (48.0-54.2)	54.2 (48.0-54.2)	< 0.001
Mental health	50.7 (44.9-50.7)	44.9 (44.9-50.7)	50.7 (44.9-50.7)	50.7 (50.7-56.9)*	50.7 (50.7-56.9)	50.7 (50.7-56.9)**	< 0.001
SF-8 summary scores							
Physical component summary	52.1 (47.4-55.0)	43.3 (38.2-47.9)**	48.0 (43.4-53.6)*	50.2 (45.4-54.0)	50.5 (45.1-54.7)	50.4 (45.7-53.0)	< 0.001
Mental component summary	48.8 (43.3-52.3)	45.3 (41.8-50.0)	47.5 (44.1-52.2)	50.2 (45.0-54.1)	50.5 (44.5-53.9)	51.6 (46.3-54.1)**	< 0.001
EPIC							
Urinary domain	93.8 (86.8-97.9)	54.2 (42.3-64.9)**	64.6 (52.1-77.8)**	73.6 (65.3-86.3)**	79.8 (68.8-89.6)**	80.6 (71.2-92.8)*	< 0.001
Bowel domain	83.9 (80.4-85.7)	78.6 (67.9-83.9)**	82.1 (73.2-85.7)	82.1 (76.8-85.7)	83.9 (80.4-85.7)	83.9 (80.4-85.7)	< 0.001
Sexual domain	36.8 (30.8-50.0)	30.8 (26.4-30.8)**	30.8 (23.1-30.8)**	30.8 (26.4-30.8)**	30.7 (26.9-30.8)**	30.8 (25.2-30.8)**	< 0.001
Hormonal domain	93.2 (88.6-97.7)	90.9 (83.5-97.7)	94.3 (86.4-97.7)	94.3 (86.4-100.0)	95.4 (88.6-100.0)	95.5 (88.6-100.0)	< 0.001

Note. Changes in the SF-8 and EPIC scores over time were analyzed using the Friedman test (p-values are shown on the right side of the table). For multiple comparisons between the preoperative and postoperative scores, Bonferroni correction was applied to adjust for multiple testing (*p < 0.05, **p < 0.01). IQR, interquartile range

95 % CI = 1.01–1.03; p = 0.005) and Hormonal summary (PR = 1.03; 95 % CI = 1.00–1.06; p = 0.029) were significant. No significant associations were found between patient characteristics and clinical data (Table 3).

In multivariable analysis (Model 1), mental component summary was significantly associated with treatment satisfaction (PR = 1.04; 95 % CI = 1.00–1.08; p = 0.049). The physical component summary (PR = 1.02; 95 % CI = 0.99–1.06; p = 0.157) and urinary summary (PR = 1.01; 95 % CI = 0.99–1.02; p = 0.219) were not significant. In Model 2, the mental component summary showed a trend toward significance but did not reach statistical significance (PR = 1.03; 95 % CI = 0.99–1.07; p = 0.125) (Table 3).

Discussion

This study examined the association between treatment satisfaction and QOL at 12 months after RARP. The main finding was that the mental com-

ponent summary was significantly associated with treatment satisfaction in the multivariable analysis, whereas disease-specific QOL was not. These results suggest that mental health plays an important role in treatment satisfaction among patients who underwent radical prostatectomy for prostate cancer.

In this study, approximately 65 % of the patients were satisfied with their treatment at 12 months postoperatively. This proportion remained relatively stable from 1 month (53 %) to 12 months (65 %), with no significant change over time (p = 0.330). Previous studies on Japanese patients have reported treatment satisfaction rates of 64.8 % at 12 months after RARP⁸⁾, and our results were generally consistent with these findings. These findings suggest that treatment satisfaction is established relatively early after surgery and remains stable thereafter. Patient evaluation of treatment may be more strongly influenced by the decision-making process and preoperative expectation formation than by acute postoperative experiences^{19,20)}. More

Table 3
Modified Poisson regression analysis with robust error variance to identify the association between QOL and satisfaction at 12 months

Factor	Univariable analysis		Multivariable analysis (Model 1)		Multivariable analysis (Model 2)	
	PR (95%CI)	P-value	PR (95%CI)	P-value	PR (95%CI)	P-value
SF-8 subscale scores at 12 months						
Physical functioning	1.03 (0.99-1.06)	0.070	—	—	—	—
Role physical	1.05 (1.01-1.08)	0.005	—	—	—	—
Bodily pain	1.04 (1.01-1.09)	0.029	—	—	—	—
General health	1.04 (1.02-1.07)	<0.001	—	—	—	—
Vitality	1.04 (1.01-1.06)	0.008	—	—	—	—
Social functioning	1.04 (1.01-1.07)	0.004	—	—	—	—
Role emotional	1.08 (1.04-1.13)	<0.001	—	—	—	—
Mental health	1.07 (1.03-1.11)	<0.001	—	—	—	—
SF-8 summary scores at 12 months						
Physical component summary	1.04 (1.01-1.08)	0.018	1.02 (0.99-1.06)	0.157	1.02 (0.99-1.06)	0.218
Mental component summary	1.06 (1.02-1.09)	0.002	1.04 (1.00-1.08)	0.049	1.03 (0.99-1.07)	0.125
EPIC summary scores at 12 months						
Urinary summary	1.02 (1.01-1.03)	0.005	1.01 (0.99-1.02)	0.219	1.01 (0.99-1.02)	0.230
Bowel summary	1.02 (0.99-1.05)	0.215	—	—	—	—
Sexual summary	1.00 (0.98-1.02)	0.884	—	—	—	—
Hormonal summary	1.03 (1.00-1.06)	0.029	—	—	1.01 (0.98-1.04)	0.407
Characteristics and clinical data						
Age	0.99 (0.95-1.02)	0.375	—	—	—	—
Spouse (reference; no)	0.93 (0.51-1.67)	0.796	—	—	—	—
Employed (reference; no)	0.87 (0.64-1.18)	0.381	—	—	—	—
Nerve sparing (reference; no)	1.05 (0.71-1.56)	0.795	—	—	—	—
PSA level	1.01 (0.99-1.03)	0.185	—	—	—	—
D'Amico risk classification						
Low	0.79 (0.42-1.50)	0.469	—	—	—	—
Intermediate	1.07 (0.78-1.45)	0.686	—	—	—	—
High	1.02 (0.75-1.38)	0.921	—	—	—	—
Medical history (reference; no)	0.98 (0.72-1.34)	0.908	—	—	—	—

Note. Modified Poisson regression analysis with robust error variance was performed to examine the association between satisfaction and QOL at 12 months. Satisfaction was used as the dependent variable. “Extremely satisfied” and “satisfied” were defined as satisfied, whereas “uncertain,” “dissatisfied,” and “extremely dissatisfied” were defined as dissatisfied. Owing to multicollinearity among the SF-8 subscales (maximum VIF = 11.4), summary scores (physical component summary and mental component summary) were used in the multivariable analysis. Model 1 included physical component summary, mental component summary, and Urinary summary. Model 2 included all the variables in Model 1, in addition to the Hormonal summary. PR, prevalence ratio; CI, confidence interval; PSA, prostate-specific antigen

than half of the patients were satisfied with their treatment at 1 month postoperatively, despite substantial declines in SF-8 and EPIC scores at that time point. The perception of being free of cancer was associated with treatment satisfaction²¹⁾, and the results of this study were thought to reflect the trend that patients accepted temporary functional decline and prioritized curing cancer as the main goal of treatment. Some participants reported dis-

satisfaction during the postoperative period. Patients’ high expectations of RARP, the latest robot-assisted surgery, may have led to dissatisfaction²²⁾. Identifying the factors associated with dissatisfaction and developing interventions for this group are clinically important.

To summarize the longitudinal changes in QOL, the SF-8 scores declined the most at 1 month postoperatively and generally recovered to preopera-

tive levels by 6 months. In contrast, the EPIC Urinary domain did not recover to preoperative levels by 12 months postoperatively; the sexual domain declined substantially at 1 month and showed no recovery after 12 months. The lack of sexual function recovery may be partly attributable to the low rate of nerve-sparing surgeries. These recovery patterns are generally consistent with those of previous reports on QOL after RARP²³⁻²⁵, and the participants in this study reflected a typical RARP patient population. In addition, although the participants' age and risk classification were similar to those of Japanese RARP patients²⁶, nerve-sparing procedures were performed less frequently in this study.

This study showed that the mental component summary score was independently associated with treatment satisfaction. Although seven of the eight SF-8 subscales were significant in univariable analysis, only the mental component summary remained significant in multivariable analysis. The PR per 1-point increase in the mental component summary was 1.04 (95 % CI = 1.00–1.08). Considering the standard deviation of the mental component summary (approximately six points), a 1-SD difference corresponds to a PR of approximately 1.25, indicating that patients with a 1-SD higher mental component score are 25 % more likely to be satisfied with their treatment, which could be considered a clinically meaningful effect size. However, given that the results did not reach statistical significance in Model 2 analysis ($p = 0.125$), these findings should be interpreted with caution. However, the associations observed in the subscales related to mental health, particularly role emotional (PR = 1.08; 95 % CI = 1.04–1.13; $p < 0.001$) and mental health (PR = 1.07; 95 % CI = 1.03–1.11; $p < 0.001$), were consistent with the mental component summary findings. These findings suggest that treatment satisfaction in patients with prostate cancer is influenced by not only physical functional recovery but also emotional adaptation and mental

well-being. A previous study reported that psychological factors played an important role in treatment satisfaction among patients with cancer²⁷. The ability of patients to adapt to a new daily life may influence their overall evaluation of treatment. Additionally, the Mental health score in this study was significantly higher at 12 months postoperatively than preoperatively. Patients reported experiencing posttraumatic growth during cancer diagnosis and treatment, which was associated with better psychological adaptation, including lower anxiety and depressive symptoms²⁸. Positive psychological changes, such as a sense of accomplishment from overcoming treatment, may contribute to improved mental health and satisfaction with treatment.

In contrast, urinary summary was not significantly associated with treatment satisfaction in the multivariable analysis, despite being significant in the univariable analysis. Previous studies have reported an association between treatment satisfaction and urinary function^{8,10}; however, these studies showed different results. The patient was provided sufficient information before surgery for urinary incontinence, a typical complication of prostate cancer. Therefore, patients who received adequate preoperative explanation about potential urinary dysfunction may have accepted actual symptoms as “expected” and were less likely to become dissatisfied with overall treatment. More than half of the patients were satisfied with their treatment at 1 month postoperatively, despite substantial declines in SF-8 and EPIC scores at that time point. Furthermore, approximately 65 % of the patients were satisfied with their treatment at 12 months despite persistent functional impairments. This supports the notion that patients' treatment satisfaction is based not on individual functional outcomes but on a more comprehensive evaluation, particularly mental health and overall well-being.

Implications for Nursing Practice

In recent years, the widespread adoption of RARP has led to minimally invasive surgery²⁹⁾ and improved functional outcomes, such as urinary³⁰⁾ and sexual function³¹⁾. However, in this study, the patients remained dissatisfied with their postoperative treatment. Furthermore, treatment satisfaction was associated with the mental QOL. These results suggest that improvements in the physical aspects of care through advances in surgical techniques alone are insufficient to enhance patient treatment satisfaction adequately. Nursing care that supports patients' mental health plays an important role in improving treatment satisfaction.

During postoperative follow-up, nurses should assess mental health status. During outpatient visits, in addition to confirming physical symptoms, such as urinary function and pain, nurses should actively assess patients' emotional states and psychological adaptation. Nurses can identify mental health issues early and provide support when necessary.

Nurses should explain not only the expected functional changes but also the psychological adaptation process during preoperative orientation. Informing patients that many adapt over time may facilitate their psychological preparation. Additionally, to minimize the gap between patient expectations and reality, it is important to provide realistic yet hopeful information about the recovery outlook.

Ongoing support is required for patients who remain dissatisfied postoperatively. Nurses should individually assess the factors underlying dissatisfaction and provide care to address them. Encouraging participation in peer support groups may also be considered an approach for supporting psychological adaptation.

Treatment satisfaction may be an outcome of nursing care after RARP. This study suggests that improving treatment satisfaction requires support for patients' mental health. In daily nursing prac-

tice, the effectiveness of comprehensive care, including psychological support, is reflected in patient satisfaction with the treatment.

Limitations

This study has some limitations. First, there was a sample size constraint. The number of variables that could be examined in multivariable analysis was limited relative to the number of events, and the power to detect the independent contributions of variables with small effect sizes may have been insufficient. The fact that the mental component summary did not reach statistical significance in Model 2 analysis ($p = 0.125$) may reflect this power limitation. Further studies with larger sample sizes are warranted. Second, owing to multicollinearity among the SF-8 subscales (maximum VIF = 11.4), the independent contributions of the individual subscales could not be evaluated. This study addressed this issue using summary scores; however, the specific aspects that are most important should be examined in future studies. Third, the observation period of this study was limited to 12 months postoperatively. However, a previous study reported that urinary and sexual functions improved 12 months after surgery³²⁾. Therefore, treatment satisfaction may not have been evaluated when these functions have fully recovered. Long-term follow-up studies are required to clarify whether mental health remains associated with treatment satisfaction even after functional recovery has progressed. Fourth, the interpretation of the potential direction of QOL and treatment satisfaction in the results of this study is limited. In this study, treatment satisfaction was modeled as the outcome variable. However, given the design of this study, the causal direction cannot be determined. Patients who are more satisfied with their treatment may perceive their QOL more positively. Therefore, the possibility of reverse causality may be considered. Finally, this was a single-center study, and the generalizability of the results is lim-

ited. Despite these limitations, this study demonstrates the importance of mental health in treatment satisfaction among patients following RARP.

Conclusion

Twelve months after RARP for prostate cancer, the mental component summary score is independently associated with treatment satisfaction. These findings suggest that, in postoperative patient care, attention to mental health, in addition to support for physical functional recovery, may be important for improving treatment satisfaction. In contrast, some participants reported dissatisfaction throughout the postoperative period. Identifying the factors associated with dissatisfaction and developing interventions for this group are clinically important in the future.

Conflict of interest

The author declare no conflicts of interest.

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ロボット支援前立腺全摘除術後の治療満足度と QOL との関連： 術後 1 年間の縦断研究

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要 旨

【目的】ロボット支援根治的前立腺摘除術（RARP）を受けた患者の治療満足度と生活の質（QOL）との関連を明らかにすることを目的とした。

【方法】RARP 患者 108 名を対象に術前および術後 1, 3, 6, 9, 12 ヶ月に質問紙調査を実施した。評価項目は治療満足度、一般的健康関連 QOL、前立腺がん特異的 QOL とした。12 ヶ月時点の治療満足度と QOL との関連について修正ポアソン回帰分析を実施した。

【結果】半数以上の者は調査期間を通じて満足していたが、不満足と回答した者もいた。精神的健康が 12 ヶ月時点での治療満足度と有意に関連していた（有病割合比 = 1.04, 95% 信頼区間 = 1.00-1.08, $p = 0.049$ ）。一方、排尿機能および性機能は治療満足度と関連していなかった。

【結論】心理的要因は RARP 後の治療満足度と関連する可能性がある。治療満足度向上のため精神面へのケアが重要であると示唆された。今後、不満足に関連する要因の特定が求められる。

キーワード

ロボット支援前立腺全摘除術, 治療満足度, 生活の質, 前立腺がん

