

# Comparison of Quality of Life in Patients with Prostate Cancer Who Received Curative Radiation Therapy, Radical Prostatectomy, or Combined Treatment

## Prostat Kanseri Tanısıyla Küratif Radyoterapi, Radikal Prostatektomi veya Kombine Tedavi Yapılan Hastaların Yaşam Kalitesi Açısından Karşılaştırılması

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### ABSTRACT

**Objective:** In recent years, the importance of quality of life (QoL) in healthcare has increased significantly, particularly in the management of chronic diseases such as prostate cancer (PCa). We aimed to show the effects of functional outcomes of treatment options, such as retropubic radical prostatectomy (RRP), radiotherapy (RT), and active surveillance, on QoL in patients with localized PCa.

**Methods:** Questionnaires on demographic characteristics, QoL, urinary incontinence (UI) level, patients' knowledge of complications before treatment, and treatment of complications were completed. Patients diagnosed with PCa were divided into three groups: RRP, RT, and RRP combined with RT.

**Results:** There was no statistical difference between the treatment groups in terms of QoL, Mini-mental test scores, age, body mass index, prostate-specific antigen level, Charlson index, and International Society of Urological Pathology grade score, but UI scores were lower in the RT group. The most important finding was that QoL was statistically higher in patients who were informed about UI and erectile dysfunction (ED) before treatment and in patients who were treated for UI or ED after treatment.

**Conclusion:** Our study suggests that the choice of treatment (RRP, RT, or RRP combined with RT) does not significantly affect the overall QoL of patients with localized PCa. However, patient education about potential complications, such as ED and UI, followed by appropriate treatment appears to be crucial for improving QoL after treatment.

**Keywords:** Prostate cancer, quality of life, retropubic prostatectomy, radiotherapy

### ÖZ

**Amaç:** Son yıllarda, özellikle prostat kanseri gibi kronik hastalıkların yönetiminde, sağlık hizmetlerinde yaşam kalitesinin önemi önemli ölçüde artmıştır. Lokalize prostat kanserinde retropubik radikal prostatektomi (RRP), radyoterapi (RT) ve aktif gözlem gibi tedavi seçeneklerinin fonksiyonel sonuçlarının yaşam kalitesi üzerindeki etkilerini göstermeyi amaçladık.

**Yöntem:** Demografik özellikler, yaşam kalitesi, üriner inkontinans (Üİ) düzeyi, hastaların tedavi öncesi komplikasyonlar ve komplikasyonların tedavisi hakkındaki bilgileri ile ilgili anketler dolduruldu. Prostat kanseri tanısı konan hastalar üç gruba ayrıldı: RRP, RT ve RT ile kombine RRP.

**Bulgular:** Tedavi grupları arasında yaşam kalitesi, Mini-mental test skorları, yaş, vücut kitle indeksi, prostat spesifik antijen düzeyi, Charlson indeksi ve Uluslararası Ürolojik Patoloji Derneği derece skoru açısından istatistiksel fark bulunmazken, Üİ skorları radyoterapi grubunda daha düşüktü. En önemli bulgu, tedavi

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öncesinde Üİ ve erektil disfonksiyon (ED) hakkında bilgilendirilen hastalar da ve tedavi sonrasında Üİ veya erektil disfonksiyon için tedavi edilen hastalar da yaşam kalitesinin istatistiksel olarak daha yüksek olmasıydı.

**Sonuç:** Çalışmamız, tedavi seçiminin (RRP, RT veya RRP + RT) lokalize prostat kanseri hastalarında genel yaşam kalitesi sonuçlarını önemli ölçüde etkilemediğini göstermektedir. Bununla birlikte, Üİ ve ED gibi potansiyel komplikasyonlar hakkında hasta eğitimi ve ardından uygun tedavi, tedavi sonrası yaşam kalitesini iyileştirmek için çok önemli görünmektedir.

**Anahtar Kelimeler:** Prostat kanseri, yaşam kalitesi, retropubik prostatektomi, radyoterapi

## INTRODUCTION

In recent years, quality of life (QoL) has become increasingly important in the field of health. Technological advances and developments in treatment methods have increased the life expectancy of patients, shifting the focus toward long-term living with chronic diseases for extended periods. As a result, patient comfort has also become a key consideration. The impact of different treatment options for prostate cancer (PCa) on efficacy, cost, and QoL should be considered. Therefore, it is essential for both patients and healthcare professionals to aim for success in cancer treatment while preserving patients' QoL.<sup>1,2</sup>

The widespread use of prostate-specific antigen (PSA) testing has increased the proportion of clinically localized cases among new PCa diagnoses to 81%. Awareness of the adverse effects of current treatment options for localized PCa and making informed treatment decisions with the patient can positively impact QoL. Currently, treatment options for localized PCa are generally divided into three main groups: active surveillance (AS), retropubic radical prostatectomy (RRP) and radiotherapy (RT).<sup>3,4</sup>

Surgical complications following RRP are highly variable due to the use of different techniques. The most common postoperative complication is erectile dysfunction (ED), but other issues, such as dry ejaculation, changes in orgasm quality, and pain during orgasm, are also significant. Long-term urinary incontinence (UI) is the second most common complication, but voiding difficulties associated with bladder neck contracture are also observed. In the long term, no significant difference in disease-specific functional outcomes has been observed between men undergoing RRP or RT.<sup>5,6</sup> In our study, we will compare QoL data and post-treatment functional outcomes in patients undergoing RRP, RT, and RRP+RT treatment.

## METHODS

The study was approved by the Clinical Research Ethics Board of İstanbul Medeniyet University, Göztepe Training and Research Hospital (approval number: 2022/0073, date: 09.02.2022).

Between March 2022 and June 2022, 107 patients admitted to the uro-oncology outpatient clinic with a diagnosis of PCa voluntarily completed the study questionnaire in the presence of medical students. Patients were divided into three groups (RRP, RT, and RRP+RT). Demographic

information and comorbidities of the patients were collected using the World Health Organization Quality of Life questionnaire: Turkish Brief Version (WHOQOL-BREF-TR), International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF), and Mini-mental test (MMT) were also administered. The WHOQOL-BREF-TR is a tool containing a total of 26 items from four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), environmental health (8 items), and general health (2 items). Each item was scored on a 5-point Likert scale from 1 to 5. The scores obtained were then evaluated on a scale of 0-100.<sup>7-9</sup> Patients who did not wish to complete the form or were diagnosed with Alzheimer's disease were excluded from the study.

## Statistical Analysis

Statistical analysis was performed using Statistical Package for the Social Sciences version 26. The numerical data in our study did not follow a normal distribution according to the Kolmogorov-Smirnov test.  $P < 0.05$  was considered significant. The Kruskal-Wallis test was used for groups of three or more when analyzing non-parametric independent variables, and the Mann-Whitney U test was used when comparing two groups with non-parametric independent variables. On the other hand, the Spearman correlation test was used when analyzing numerical data among themselves. The chi-square test was used to compare groups with nominal data.

## RESULTS

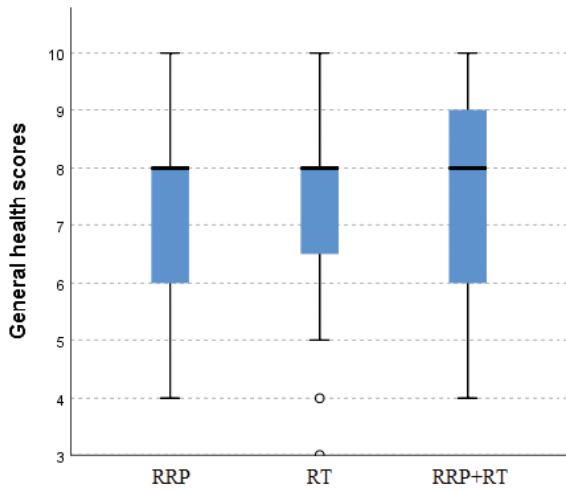
Age at diagnosis and body mass index were significantly higher in the RT group compared with the other two groups, but the follow-up period was shorter. PSA levels and International Society of Urological Pathology grade scores at diagnosis were highest in the RRP + RT group, second highest in the RT group, and third highest in the RRP group (Table 1). When comparing the RRP, RT, and RRP + RT groups, the WHOQOL-BREF-TR scores in the general health domain (Figure 1), physical health domain, psychological health domain, social relationships domain, environmental health domain, and MMT (Figure 2) scores were not statistically different (Table 2). However, a statistically significant difference was found when evaluating the ICIQ-SF test to assess UI ( $p = 0.006$ ). While the ICIQ-SF scores were similar between the RRP and RRP + RT groups, they were lower in the RT group (Figure 3).

<b>Table 1. Patient characteristics according to treatment modalities</b>				
	<b>RRP only group with (n=45)</b>	<b>RT only group with (n=24)</b>	<b>RRP+RT group with (n=38)</b>	<b>p value</b>
Age (mean±SD) (min-max)	(68.67±7.69) (46-82)	(72.21±6.59) (54-80)	(71±8.41) (49-85)	0.110
Age at diagnosis	(63.16±7.63) (43-78)	(69.13±6.60) (52-79)	(65.13±8.10) (42-77)	0.006
BMI	(26.80±2.82) (20-34)	(29.41±4.66) (19-39)	(27.29±5.09) (24.5-36)	0.025
Cigarette pack/year	(19.64±19.98) (0-80)	(18.79±18.54) (0-70)	(24.05±20.22) (0-70)	0.498
Charlson comorbidity index	(2.69±0.9) (0-4)	(3.17±0.7) (2-4)	(3±0.96) (1-5)	0.069
Follow-up time (month)	(66.67±60.14) (12-240)	(37.50±26.55) (12-108)	(70.42±45.09) (12-192)	0.011
PSA level upon diagnosis	(10±9.18) (2-44)	(16.04±20.36) (2-90)	(25.63±31.76) (4-154)	0.003
Education level (%) Illiterate Primary school graduate Secondary school graduate High school graduate University graduate	1 (2.2) 20 (44.4) 7 (15.6) 9 (20) 8 (17.8)	0 (0) 16 (66.7) 1 (4.2) 3 (12.5) 4 (16.7)	2 (5.3) 21 (55.3) 7 (18.4) 5 (13.2) 3 (7.9)	0.461
ISUP grade group ISUP grade 1 ISUP grade 2 ISUP grade 3 ISUP grade 4 ISUP grade 5	14 (31.1) 16 (35.6) 6 (13.3) 6 (13.3) 3 (6.7)	7 (29.2) 8 (33.3) 1 (4.2) 7 (29.2) 1 (4.2)	5 (13.2) 5 (18.4) 6 (15.8) 11 (28.9) 9 (23.7)	0.036
No ED information was provided before treatment. ED information was provided before treatment.	6 (13.3) 39 (86.7)	10 (43.5) 13 (56.5)	12 (31.6) 26 (68.4)	0.019
No ED before treatment ED before treatment	35 (77.8) 10 (22.2)	12 (50) 12 (50)	27 (71.1) 11 (28.9)	0.056
No ED at the moment I've got an ED now.	6 (13.3) 39 (86.7)	3 (12.5) 21 (87.5)	3 (12.5) 21 (87.5)	0.718
Incontinence was not explained before treatment. Incontinence was explained before treatment.	5 (11.1) 40 (88.9)	11 (45.8) 13 (54.2)	11 (28.8) 27 (71.1)	0.005
No incontinence before treatment Pretreatment incontinence stress types Urge incontinence before treatment Mixture of pre-treatment incontinence mix	40 (88.9) 3 (6.7) 1 (2.2) 1 (2.2)	17 (70.8) 2 (8.3) 4 (16.7) 1 (4.2)	33 (86.8) 3 (7.9) 0 2 (5.3)	0.088
SD: Standard deviation, RRP: Retropubic radical prostatectomy, RT: Radiotherapy, Min-max: Minimum-maksimum, BMI: Body mass index, PSA: Prostate-specific antigen, ISUP: International Society of Urological Pathology, ED: Erectile dysfunction				

WHOQOL-BREF-TR scores in the general health domain ( $p=0.038$ ) and psychological health domain ( $p=0.010$ ) were significantly higher in patients who received information about ED prior to PCa treatment (RRP, RT, and RRP + RT) than in patients who did not receive information. WHOQOL-BREF-TR scores in the psychological health domain ( $p=0.039$ ) were significantly higher in patients who

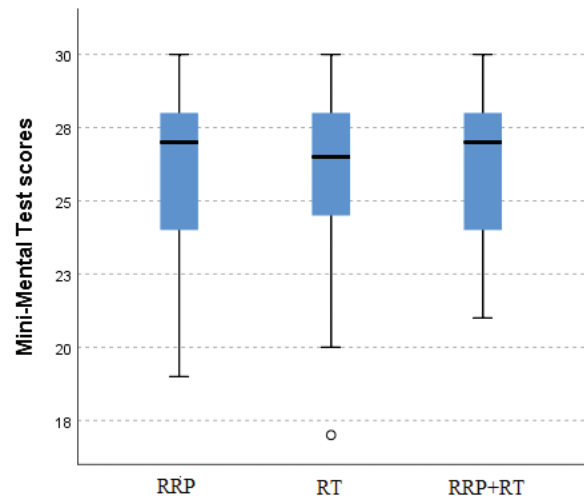
received information about UI prior to PCa treatment than in those who did not.

There were no statistically significant differences in the WHOQOL-BREF-TR data when patients were grouped according to the type of UI (stress, urge, and mixed) before and after PCa treatment or according to the presence of ED before and after PCa treatment.



**Figure 1.** Distribution of general health scores according to RRP, RT, and RRP+RT treatment groups

RRP: Retropubic radical prostatectomy, RT: Radiotherapy



**Figure 2.** Distribution of Mini-mental test scores according to RRP, RT, and RRP + RT treatment groups

RRP: Retropubic radical prostatectomy, RT: Radiotherapy

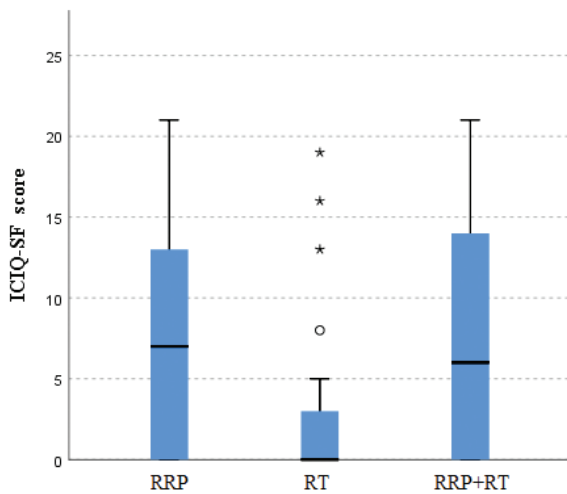
<b>Table 2. ICIQ-SF, WHOQOL-BREF-TR, Mini-mental test results according to treatment modality</b>				
<b>(Mean±SD) (min-max)</b>	<b>RRP only group with (n=45)</b>	<b>RT only group with (n=24)</b>	<b>RRP+RT the group that is (n=38)</b>	<b>p value</b>
ICIQ-SF	(7.53±6.8) (0-21)	(3.17±5.43) (0-19)	(8.08±7.11) (0-21)	0.006
WHOQOL-BREF-TR, general health	(7.42±1.6) (4-10)	(7.25±1.62) (3-10)	(7.24±1.72) (4-10)	0.883
WHOQOL-BREF-TR, physical health	(27.84±4.44) (18-35)	(26.21±5.18) (11-36)	(27.5±4.77) (10-35)	0.311
WHOQOL-BREF-TR, psychological health	(23.22±3.06) (14-30)	(23.08±4.44) (17-31)	(22.89±4.03) (13-30)	0.768
WHOQOL-BREF-TR, social relations	(10±2.17) (6-15)	(10.38±4.61) (4-30)	(9.84±1.97) (4-13)	0.996
WHOQOL-BREF-TR, environment	(31.69±3.89) (22-40)	(31.54±4.85) (22-39)	(32.08±5.15) (22-45)	0.886
Mini-mental test	(26.02±2.81) (19-30)	(25.83±3.16) (17-30)	(26.39±2.72) (21-30)	0.725

ICIQ-SF: International Consultation on Incontinence Questionnaire Short Form, WHOQOL-BREF-TR: World Health Organization Quality of Life questionnaire-Turkish Brief Version, SD: Standard deviation, Min-max: Minimum-maksimum, RRP: Retropubic radical prostatectomy, RT: Radiotherapy

WHOQOL-BREF-TR physical health domain (p=0.026) and psychological health domain (p=0.025) questionnaire scores were statistically higher in patients who received ED treatment after PCa compared with patients who did not receive ED treatment. Similarly, the WHOQOL-BREF-TR physical health domain (p=0.036) and psychological health domain (p=0.022) questionnaire scores were statistically higher in patients who received UI treatment after PCa treatment than in those who did not receive treatment.

**DISCUSSION**

In this study, we evaluated the effects of different treatment modalities for localized PCa on QoL. There were no differences in QoL outcomes between the RRP, RT, and RRP + RT groups. QoL data have been questioned according to the type of complications resulting from surgery or RT.<sup>10,11</sup> QoL data from patients with AS were not included in our study, and the RT group was not divided into external RT and brachytherapy subgroups. At this point, the study by Huang et al,<sup>12</sup> who reported a 4-year follow-up data of 1269 patients with localized PCa, confirmed that



**Figure 3.** Distribution of ICIQ-SF scores according to RRP, RT, and RRP + RT groups

*ICIQ-SF: International Consultation on Incontinence Questionnaire Short Form, RRP: Retropubic radical prostatectomy, RT: Radiotherapy*

RRP and all types of RT have significant negative effects on urinary and sexual function. Similar to our study, they highlighted that age at diagnosis and time since treatment were important determinants of QoL in men with clinically localized PCa and that RRP was associated with more UI than external beam RT or brachytherapy.<sup>13</sup>

A 5-year cohort study by Korfage et al.<sup>14</sup> evaluated two groups, RRP and RT, and showed that RRP mainly affected urinary and sexual function, whereas RT had effects on bowel, urinary, and sexual function. The relationship between advancing age and declining physical function was highlighted, and the decline in physical function with advancing age may be a natural consequence of aging. Although the questionnaire data in our study did not ask for bowel function, the results of our cross-sectional study are consistent with those of long-term studies.<sup>15-17</sup>

A study by Stanford et al.<sup>18</sup> found a 73% reduction in the number of patients with sexual dysfunction after RRP. When assessing the extent of sexual dysfunction within 2 years after surgery, 14% of patients reported no problem at all, whereas 23% reported a minor problem. Studies in the literature have highlighted that there is no expected correlation between the level of sexual function and the level of discomfort and that the effect of ED on patients' QoL is variable and individual.<sup>19</sup>

In the patients who participated in our study, QoL increased in patients who were informed about possible complications, such as ED and UI, before PCa treatment and in those who received treatment for these complications

after PCa treatment. These results show that the variable and personalized adverse effects of PCa treatment can be minimized by providing accurate information to patients prior to treatment.

According to the review by Yiannopoulou et al.,<sup>20</sup> which included a total of 21 articles, RRP, RT, and AS are psychologically well-tolerated treatments, and patients receiving these treatments may need emotional support. However, it was suggested that emotional problems and mental decline may occur at different levels with each treatment option, and it was emphasized that information on the long- and short-term outcomes of treatment should be provided. Hoffman et al.<sup>21</sup> conducted a 5-year prospective study and found no significant difference in depressive symptoms and emotional well-being during the follow-up period of RRP, RT, AS, and androgen suppression treatments.

Perez et al.<sup>22</sup> compared patients who received ED treatment after RRP with patients who did not receive ED treatment after RRP. Although the group receiving ED treatment reported statistically significantly better erectile function, orgasm during intercourse, satisfaction with current sexual function, and overall satisfaction with their sexual life compared to the group not receiving treatment, no difference was observed between the groups when asked about their overall QoL.

Similar to our findings, Zhang et al.<sup>23</sup> analyzed the effect of pelvic floor muscle exercises on QoL after RRP. QoL was assessed at baseline and after 3 months. They showed that a UI-focused intervention improved QoL in these patients.

There are also studies evaluating a three new trocar approach for RRP with laparoscopic management and comparing it with the conventional method. They showed that the three trocar techniques resulted in significantly shorter operative times, reduced CO<sub>2</sub> usage, and shorter hospital stays, which may improve patients' postoperative QoL.<sup>24</sup>

### Study Limitations

The number of patients in our study could have been increased, and a prospective study rather than a cross-sectional study as in our study would have made the data more reliable.

### CONCLUSION

There were no differences in QoL outcomes between the RRP, RT, and RRP + RT treatment groups. However, providing patients with information about ED and UI before treatment and then treating these complications improved QoL.



## Ethics

**Ethics Committee Approval:** The study was approved by the Clinical Research Ethics Board of İstanbul Medeniyet University, Göztepe Training and Research Hospital (approval number: 2022/0073, date: 09.02.2022).

**Informed Consent:** Not applicable.

## Footnotes

### Authorship Contributions

Surgical and Medical Practices: M.Ç., Concept: T.T., Design: T.T., Data Collection or Processing: Ö.E., M.E.B., Z.B., A.M., A.Y., Analysis or Interpretation: T.T., Literature Search: Y.E.B., Writing: Y.E.B.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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