

Changes in the quality of life of a population of Polish men undergoing radical prostatectomy: a 12-month longitudinal observational study

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Introduction In the literature on cancer treatment, there is growing interest in quality of life (QoL).

Improvement in QoL is coming to be regarded as a key consideration in maintaining standards of care. The choice of medical intervention should be based not only on a patient's physical health, test results, and the stage of the disease, but also on their emotional and psychosocial condition.

Material and methods The study included a group of 72 men with prostate cancer scheduled for radical prostatectomy (RP). QoL was assessed using standardised and validated questionnaires. The survey was conducted before surgery and then after 3, 6, 9, and 12 months.

Results Analysis of changes in QoL 3 months after surgery showed a significant decrease in all symptomatic and functional domains, the largest decrease being observed in social functioning. One year after surgery, most scores had returned to their preoperative level, with the exception of those for social functioning, symptoms of pain, insomnia, and financial difficulties. It was noted that preoperative urinary symptom scale scores were significantly lower than those obtained one year after RP, the largest difference being apparent in the first months after surgery. It was also found that the number of people using incontinence precautions significantly increased 3 months after surgery and continued to do so.

Conclusions The greatest deterioration of QoL occurs in the first months after surgery and mainly affects social, emotional, and sexual functioning, as well as symptoms related to incontinence and fatigue.

Key Words: prostatectomy <> quality of life <> prostate cancer

INTRODUCTION

An extremely important part of cancer treatment is monitoring patients' quality of life (QoL). Research on QoL became widespread in the 1970s thanks to the American social psychologist Angus Campbell, who at the time was one of the few to include the factor of subjectivity in the assessment of satisfaction with life [1–3]. Although more than half

a century has passed since the first studies on QoL, there is still no single definition that clearly defines QoL. Presumably, one of the main reasons for this situation is that the definition depends on the field of scientific enquiry within which the concept is being employed.

In the field of medical science, which naturally views quality of life as being closely linked with health status, a specific notion of QoL has emerged: health-related

quality of life (HRQoL). Because this indicator is difficult to assess, it is treated as a dependent variable that is influenced by, in addition to psychosocial conditions, the progress of the disease and the course of treatment [4, 5]. This was one of the reasons why the process of introducing QoL assessment in clinical medicine initially encountered many difficulties.

A factor of key importance in the study of the level of QoL is the use of research tools adapted for this purpose characterised by high values of reliability and relevance. Since this is a highly subjective measure, a group of researchers centred around the European Organisation for Research and Treatment of Cancer (EORTC) has stated that this assessment should be made by the subjects themselves. However, to analyse health status comprehensively, a patient's subjective assessment should be supplemented and contrasted with objective indicators such as laboratory tests, imaging studies, and functional tests [5].

The purpose of this article is to assess the QoL of patients with newly diagnosed prostate cancer (PCa) before and up to 12 months after radical prostatectomy (RP).

MATERIAL AND METHODS

Based on the inclusion and exclusion criteria, 72 male patients diagnosed with PCa qualified for the present study.

The inclusion criteria for the study were as follows:

- diagnosed with PCa at a defined stage,
- defined Gleason score with the absence of distant metastasis,
- qualification for RP surgery,
- absence of other forms of PCa treatment before RP.

The exclusion criteria were as follows:

- failure to meet the inclusion criteria,
- another malignancy treated within the last 5 years,
- palliative treatment,
- patient withdrawal from participation in the study.

Patients enrolled in the study underwent medical record analysis before surgery and a questionnaire survey before RP and 3, 6, 9, and 12 months after surgery.

A PAPI (paper and pen personal interview) method was used to conduct the pre-surgery survey, while post-surgery surveys were conducted using CATI (Computer-Assisted Telephone Interviewing). The survey consisted of the questionnaires EORTC QLQ-C30 (European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core

30) and EORTC QLQ-PR25 (European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Prostate Cancer Module). These questionnaires have been validated in the Polish population of men with PCa [6, 7]. They also include questions relating to age, height, weight, marital status, place of residence, education, and work activity.

The EORTC QLQ-C30 questionnaire is a tool for assessing the QoL of people with cancer; its questions and statements do not refer to the form or location of the cancer. It consists of 30 questions divided into 3 sections: global QoL, functional scales, and symptom scales. The EORTC QLQ-PR25 questionnaire is a supplementary module used to assess the severity of symptoms associated with PCa and the course of its treatment. It consists of 25 questions, which are also grouped into functional and symptom scales [8–10].

Statistical analysis

Recommendations by King for the interpretation of results indicate that a difference of 10 or more points on the 0–100 scale should be considered a clinically significant difference, a difference of more than 20 points as a particularly significant difference, and a difference of 5 points as only a possible direction of change [11, 12].

Analyses were performed using the statistical language R (version 4.1.1; R Core Team, 2021) on Windows 10×64 bit. The Wilcoxon rank-sum test was used to estimate the significance of intergroup differences for 2 independent groups, while the McNemar test was used for within-group differences between 2 dependent samples with dichotomous variables. For numeric variables, the Wilcoxon rank-sum test was used for paired data, and the effect size was estimated using a rank-based two-point correlation coefficient (r_{tp}). Friedman's ANOVA test was used to estimate differences for the 5 time points, and the effect size was estimated using Kendall's concordance coefficient (W Kendall). A Durbin-Conover test was used as a post-hoc test. Linear mixed models using restricted maximum likelihood (REML) and the nloptwrap optimiser (a combination of BOBYQA and Nelder-Mead optimisers) were used to examine the effects of multiple factors on the overall quality of life/health status scale. The significance level of the statistical tests in this analysis was set at $\alpha = 0.05$.

Bioethical standards

Approval was obtained from the Bioethics Committee of the Medical University of Silesia in Katowice, Poland (PCN/0022/KB1/11/20) to conduct the study.

All patients qualifying for the study were informed of its purpose and provided written consent for their participation.

RESULTS

Information was obtained before surgery on the age of the subjects and their morphological parameters (body height, body weight), as well as their sociodemographic situation and other details. At the subsequent time points, i.e. at 3, 6, and 9 months after the RP procedure, 72 men participated in the study, while at the time point 12 months after the procedure, the number of subjects decreased to 67 due to the withdrawal of 5 participants.

The average age of those enrolled in the study was just under 65 years (Table 1), matching the general demographic data relating to the incidence of PCa in Poland [13]. The largest number of men was in the group between 60 and 70 years of age ($n = 54$; 75.00%), while the smallest was in the age group under 60 ($n = 7$; 9.72%). Table 2 presents the sociodemographic and clinical characteristics of those qualified to participate in the study.

EORTC QLQ-C30

Analysis of the data obtained from the EORTC QLQ-C30 questionnaire shows significant differences in the distributions of score values at different time points. In the case of the global health status/quality of life scale, the greatest difference (decline) in median values was observed between the time point before surgery and 3 months after surgery (-25.0 points; $r_{rb} = 0.98$; $p < 0.001$). This difference decreased at subsequent measurement points; however, 12 months after RP, scores on the global health status/quality of life scale were still significantly lower than before surgery (Table 3).

In the functional area, all scales showed a significant decrease in median scores 3 months after surgery (≥ 25.0 points; r_{rb} from 0.93 to 1.00; $p < 0.001$). The largest decrease, of 50.0 points ($r_{rb} = 1.00$; $p < 0.001$), was observed on the social functioning scale. On the scales of physical functioning, role functioning, emotional functioning, and cognitive functioning, a lessening in score differences was observed over time, and at 12 months after RP, the level of functioning on these scales returned to the pre-operative level. Only in the case of the social functioning scale was no return of scores to preoperative values observed.

In the scores of most symptom scales, the largest significant differences were again observed between the time points before surgery and 3 months after sur-

gery (≥ 16.6 points; r_{rb} from 0.86 to 1.00; $p \leq 0.040$). Only the nausea and vomiting scale and the diarrhoea scale showed no statistically significant differences ($r_{rb} = 0.29$; $p = 0.360$ and $r_{rb} = 0.00$; $p = 1.000$,

Table 1. Characteristics of the study group

Variable	\bar{x}	SD	Min	Max	Mdn
Age [years]	64.90	4.59	53	73	64
Height [m]	1.74	0.05	1.63	1.93	1.74
Body mass [kg]	83.51	11.58	61	116	81.50
BMI	27.55	3.10	19.92	36.30	26.99

BMI – body mass index; Max – maximum; Mdn – median; Min – minimum; SD – standard deviation; \bar{x} – mean

Table 2. Sociodemographic and clinical characteristics of the study group

Variable	N	%	
Place of residence	Village	10	13.89
	City of up to 50,000 residents	12	16.67
	City of 50,000 to 100,000 residents	22	30.56
	City of more than 100,000 residents	28	38.89
Level of education	Primary	4	5.56
	Vocational	38	52.78
	Secondary	21	29.17
Marital status	Higher	9	12.50
	Married	60	83.33
	Bachelor	2	2.78
	Divorced	6	8.33
Professionally active	Widower	4	5.56
	Yes	36	50.00
	No	36	50.00
PSA [ng/ml]	<10	50	69.44
	10–15	16	22.22
	>15	6	8.33
Gleason score	6	30	41.67
	7	40	41.67
	8	11	15.28
	9	1	1.39
Surgical technique	open	19	26.39
	laparoscopic	53	73.61
Pathological classification*	pT1	3	4.23
	pT2	45	63.38
	pT3	23	32.39
Comorbidities	Yes	56	77.78
	No	16	22.22

* data refer to 71 people surveyed

N – number of people; PSA – prostate-specific antigen

respectively) between the above time points. One year after surgery, only scores on the scales of pain, insomnia, and financial difficulties remained significantly worse compared to preoperative levels, as is evident when comparing data for these scales. The detailed distributions of the scores, along with the significance values of the within-group differences at each time point, are shown in Table 3.

EORTC QLQ-PR25

Data obtained from the symptom and functional scales of the EORTC QLQ-PR25 questionnaire, a supplementary module dedicated to PCa patients, were also analysed. The scores obtained on each scale, along with the significance values of intragroup differences

at each time point, are shown in Table 4. As in the case of the domains of the EORTC QLQ-C30 questionnaire, the significance of intragroup differences at individual observation time points was analysed.

The observations show that the median value on the urinary symptoms scale before RP was significantly lower than within one year after surgery. The largest difference in scores ($r_{pb} = -1.00$, $p < 0.001$) was observed between the preoperative score and the score 3 months after surgery. A very slow reduction in this difference was observed over time (r_{pb} changed from -1.00 to -0.70), but after 12 months the score was still significantly higher than before surgery.

On the bowel symptoms scale, the level of pre-surgery scores was not significantly different

Table 3. Distribution of results with significance of intragroup differences for each scale of the EORTC QLQ-C30 questionnaire

EORTC QLQ-C30	Before surgery	3 months after surgery	p^b	6 months after surgery	p^b	9 months after surgery	p^b	12 months after surgery ^a	p^b
	Mdn (Q_1-Q_3)	Mdn (Q_1-Q_3)		Mdn (Q_1-Q_3)		Mdn (Q_1-Q_3)		Mdn (Q_1-Q_3)	
Global health status/QoL	66.7 (50.0–83.3)	41.7 (33.3–58.3)	<0.001	50.0 (41.7–58.3)	<0.001	58.3 (50.0–66.7)	<0.001	58.3 (50.0–66.7)	<0.001
Functional scales									
Physical functioning	86.7 (73.3–93.3)	66.7 (53.3–73.3)	<0.001	73.3 (60.0–80.0)	<0.001	80.0 (66.7–86.7)	<0.001	86.7 (73.3–93.3)	0.400
Role functioning	100.0 (66.7–100.0)	66.7 (50.0–66.7)	<0.001	66.7 (66.7–83.3)	<0.001	66.7 (66.7–100.0)	<0.001	100.0 (66.7–100.0)	0.960
Emotional functioning	75.0 (66.7–91.7)	50.0 (33.3–66.7)	<0.001	58.3 (50.0–66.7)	<0.001	75.0 (58.3–75.0)	0.003	75.0 (66.7–91.7)	0.150
Cognitive functioning	100.0 (83.3–100.0)	66.7 (66.7–83.3)	<0.001	83.3 (83.3–100.0)	0.320	100.0 (83.3–100.0)	0.170	100.0 (83.3–100.0)	0.004
Social functioning	83.3 (66.7–100.0)	33.3 (33.3–66.7)	<0.001	50.0 (33.3–66.7)	<0.001	66.7 (62.5–66.7)	<0.001	66.7 (66.7–83.3)	<0.001
Symptom scales									
Fatigue	33.3 (11.1–33.3)	55.6 (44.6–66.7)	<0.001	33.3 (22.2–44.4)	<0.001	33.3 (33.3–44.4)	<0.001	33.3 (11.1–33.3)	0.008
Nausea and vomiting	0.0 (0.0–0.0)	0.0 (0.0–0.0)	0.360	0.0 (0.0–0.0)	0.060	0.0 (0.0–0.0)	0.008	0.0 (0.0–0.0)	0.020
Pain	16.7 (0.0–33.3)	33.3 (29.2–33.3)	<0.001	33.3 (16.7–33.3)	0.001	16.7 (12.5–33.3)	0.880	33.3 (16.7–33.3)	0.020
Dyspnoea	0.0 (0.0–0.0)	33.3 (33.3–33.3)	<0.001	0.0 (0.0–33.3)	<0.001	0.0 (0.0–33.3)	0.230	0.0 (0.0–0.0)	0.180
Insomnia	16.7 (0.0–33.3)	33.3 (29.2–33.3)	<0.001	33.3 (16.7–33.3)	<0.001	16.7 (12.5–33.3)	0.880	33.3 (16.7–33.3)	0.020
Appetite loss	0.0 (0.0–0.0)	0.0 (0.0–33.3)	0.040	0.0 (0.0–0.0)	0.040	0.0 (0.0–0.0)	0.010	0.0 (0.0–0.0)	0.006
Constipation	0.0 (0.0–33.3)	0.0 (0.0–0.0)	0.010	0.0 (0.0–0.0)	<0.001	0.0 (0.0–0.0)	<0.001	0.0 (0.0–0.0)	<0.001
Diarrhoea	0.0 (0.0–0.0)	0.0 (0.0–0.0)	1.000	0.0 (0.0–0.0)	0.230	0.0 (0.0–0.0)	0.020	0.0 (0.0–0.0)	0.010
Financial difficulties	0.0 (0.0–33.3)	33.3 (33.3–66.7)	<0.001	33.3 (33.3–33.3)	<0.001	33.3 (33.3–33.3)	<0.001	33.3 (33.3–33.3)	0.002

^a – N = 67; ^b – vs. before surgery; Mdn – median; N – number of people surveyed; Q_1-Q_3 – first-third quartile; p – p-value

Table 4. Distribution of results with significance of intragroup differences for each scale of the EORTC QLQ-PR25 questionnaire

EORTC QLQ-PR25	Before surgery		3 months after surgery		6 months after surgery		9 months after surgery		12 months after surgery ^a	
	Mdn (Q ₁ -Q ₃)		Mdn (Q ₁ -Q ₃)	p ^b	Mdn (Q ₁ -Q ₃)	p ^b	Mdn (Q ₁ -Q ₃)	p ^b	Mdn (Q ₁ -Q ₃)	p ^b
Symptom scales										
Urinary symptoms	20.8 (8.3-33.3)		50.0 (37.5-66.7)	<0.001	41.7 (37.5-50.0)	<0.001	37.5 (32.3-41.7)	<0.001	29.2 (25.0-33.3)	<0.001
Incontinence aid	0.0 (0.0-8.3)		8.3 (0.0-8.3)	0.140	8.3 (0.0-8.3)	0.005	0.0 (0.0-0.0)	<0.001	0.0 (0.0-0.0)	<0.001
Bowel symptoms	11.1 (5.6-18.1)		16.7 (16.7-22.2)	<0.001	11.1 (11.1-16.7)	0.350	11.1 (11.1-11.1)	0.009	11.1 (11.1-11.1)	0.020
Functional scales										
Sexual activity	33.3 (33.3-50.0)		16.7 (0.0-16.7)	<0.001	16.7 (0.0-16.7)	<0.001	16.7 (16.7-33.3)	<0.001	33.3 (16.7-33.3)	<0.001

^a - N = 67; ^b - vs. before surgery; N - number of people surveyed; Mdn - median; Q₁-Q₃ - first-third quartile; p - p-value

Table 5. Distribution of scores on incontinence aid and sexual functioning scales of the EORTC QLQ-PR25 questionnaire

EORTC QLQ-PR25	Before surgery		3 months after surgery		6 months after surgery		9 months after surgery		12 months after surgery	
	N	Mdn (Q ₁ -Q ₃)	N	Mdn (Q ₁ -Q ₃)	N	Mdn (Q ₁ -Q ₃)	N	Mdn (Q ₁ -Q ₃)	N	Mdn (Q ₁ -Q ₃)
Incontinence aid	9	0.00 (0.00-33.33)	61	33.33 (0.00-66.67)	62	0.00 (0.00-33.33)	62	0.00 (0.00-0.00)	57	0.00 (0.00-0.00)
Sexual functioning	58	66.67 (50.00-81.25)	7	8.33 (4.17-12.50)	14	8.33 (8.33-14.58)	27	8.33 (8.33-16.67)	45	8.33 (8.33-16.67)

Mdn - median; N - number of people surveyed; Q₁-Q₃ - first-third quartile

from those obtained 3 months after RP, while it was significantly higher than those achieved 6-12 months after surgery. The largest difference in scores ($r_{th} = 0.90$; $p < 0.001$) was observed between scores obtained before surgery and those obtained 12 months after surgery. Analysis of the hormonal treatment-related symptom scale scores indicates that their level before surgery was significantly lower than those obtained 3 months after surgery ($r_{th} = -0.72$; $p < 0.001$), while it was significantly higher than the level of results obtained 9 and 12 months after surgery, with a tendency to decrease further ($r_{th} = 0.26$; $p = 0.009$ and $r_{th} = 0.39$; $p = 0.020$, respectively).

On the sexual activity (functional) scale, the preoperative score was significantly higher than the postoperative one-year score. The largest difference in scores ($r_{th} = 1.00$; $p < 0.001$) was observed between the preoperative score and the score 3 months after RP. A slow reduction in these differences was observed over time (r_{th} decreased from 1.00 to 0.84), but at 12 months the level of scores was still significantly lower than before surgery.

In the analysis of the results from the EORTC QLQ-PR25 questionnaire above, the symptom scale for incontinence aid and the functional scale for sexual functioning were omitted from Table 4 and from the description of the significance of intragroup differenc-

es. This is because the questions on these scales were not mandatory, and therefore the number of subjects answering them varied significantly between observation points. Accordingly, the distributions of the results for the 2 scales in question are presented in Table 5, but without indicating intra-group differences.

Based on the data presented, it can be observed that the number of subjects declaring the use of incontinence aids at 3 months after RP increased by a factor of several times compared to the observation point before surgery and was maintained at 6-12 months. In addition, at the observation point 3 months after RP, there was an increase in the median value compared to the preoperative value, but this increase did not persist during the follow-up measurements 6-12 months after surgery.

In the case of the sexual functioning scale, there was a significant decrease in the number of people declaring active functioning at each observation time point compared to the number before surgery. A marked decrease in the level of scores during subsequent measurements compared to the preoperative level of scores was also observed.

DISCUSSION

Systematic assessment of patients' QoL, which focuses on their needs and multidimensional functioning,

is crucial both in communication with patients and their caregivers and in the selection of interventions to support and complement the treatment process.

This study's first observation point for changes in QoL (3 months after surgery) indicates both statistically and clinically significant reductions in QoL in all domains of functioning. This is confirmed by the available literature, in which researchers note that the first months after surgery are characterised by significantly reduced QoL [14, 15]. It is noteworthy that in the study group, the greatest decline in QoL during this period was observed in the domains of emotional, cognitive, and social functioning. Similar observations can be seen in a study by Ruth et al., which included several hundred men who underwent prostatectomy and then qualified for a rehabilitation process. The authors also observed that the subjects presented a worse level of functioning in the psychosocial sphere than in the physical sphere, which was also the case 12 months after the completed rehabilitation process [16]. Studies indicate that the undertaking of psychosocial, cognitive, and emotionally focused interventions is essential for helping patients to cope with their new life situation [16–19]. EAU guidelines also make recommendations regarding the need for therapeutic interventions in this area [20].

On scales that assess the severity of individual symptoms related to the progression of cancer and its treatment, the strongest clinically significant differences are observed in relation to fatigue, insomnia, dyspnoea, and pain. In the case of fatigue symptoms, the present study observes an increase in the median score from 33.3 points preoperatively to 55.6 points at the first follow-up after surgery. This indicates that increased fatigue is present among PCa patients after RP, but it is not the predominant problem. This is supported by a meta-analysis by Luo et al., which indicates that the problem of fatigue affects 21% (95% CI: 16–26) of men undergoing RP – twice as many as those undergoing hormone or radiation therapy [21].

Similar observations may be made regarding the severity of insomnia, which is significantly lower than that of fatigue, indicating that sleep quality problems represent an insignificant proportion of men undergoing RP. Sleep disturbances among PCa patients are documented by Sparasci et al., who found that the percentage of patients suffering from insomnia after surgery was 18% [22]. However, as emphasised by the authors of the review, it should be noted that their assessment of the frequency and severity of sleep disorders among men after RP was based on only one qualifying study, and therefore conclusions about the magnitude of this problem should be drawn with caution [22].

In the case of both pain and dyspnoea symptoms in the group of men enrolled in the present study, there was a clinically significant increase in the level of severity 3 months after surgery; but the same was not found in large studies by Holze et al. [14] and Kretschmer et al. [15], in which the increases in scores on these scales were not clinically significant. One possible reason for this disparity is the relatively small size of the current study group, which is several times smaller than in the studies cited above, and differences between groups' health status and lifestyle habits.

It is also worth noting the changes on the scale relating to the severity of financial difficulties, which is also included in the EORTC QLQ-C30 questionnaire. The results of the present study show an increase in the median score from 0.0 points preoperatively to 33.3 points 3 months after surgery. Increasing financial difficulties among patients undergoing surgery have been a separate subject of study in the PCa literature more than once, although authors have failed to clearly identify the reasons for this phenomenon [23–25]. Nevertheless, based on the research conducted for the present study as well as that by Klein et al. [23], it is clear that in health care systems with compulsory health insurance and equal access, there are intensified financial difficulties among patients during the course of the disease and its treatment.

Turning now to analysis of the functional and symptom scales of the EORTC QLQ-PR25 questionnaire, significant changes in quality of life are again observed in the first 3 months after treatment. Changes in QoL related to urinary symptoms, sexual activity, and functioning indicate correlations confirming that RP is associated with complications in the form of urinary incontinence and erectile dysfunction [20, 26–28]. In the case of the urinary symptoms scale, the observed increase in the median score of nearly 29.8 points compared to preoperative scores indicates significant clinical changes in this domain. In addition, the increase in the number of people using incontinence precautions from 9 people (12.5%) preoperatively to 61 (84.7%) at 3 months postoperatively also testifies to the high severity of urinary symptoms. In relation to sexual activity and functioning, the most striking observation is that the number of subjects declaring sexual activity was 58 (80.6%) before surgery but only 7 (9.9%) 3 months after surgery. The main reason for such a high decline in the number of sexually active subjects is the inability to achieve and maintain an erection after RP, which is most often associated with resection of or significant damage to the neurovascular bundles responsible for penile erection [29]. In the available literature, the frequency of reported erectile dys-

function after RP varies between 14% and 90%, the wide range in these values being due to the adoption of different diagnostic criteria [27, 29]. It has been observed that even among men who remain sexually active at 3 months after surgery, the scores in individual domains determining the quality of sexual life remain lower than before surgery. This is because even among men who manage to maintain potency after RP or regain it after surgery, a decrease in erectile quality, the occurrence of pain during orgasm, and dry ejaculation are sometimes observed [20].

At later observation points, i.e. 6, 9, and 12 months after RP, gradual increases in scores on individual scales and domains are observed, indicating slow improvement in QoL. This reflects the gradual recovery of patients after surgery, as well as the lack of need to implement follow-up treatment in the group of men enrolled in the study. In the case of the subscales of the EORTC QLQ-C30 questionnaire – physical, emotional, cognitive, and social role functioning – the results obtained at successive observation points approached preoperative values and reached preoperative levels one year after surgery. Only social functioning among the subjects 12 months after RP remained significantly lower. This impairment in social QoL is also described in the previously cited studies [15, 16], whose authors, as well as the EAU guidelines, point out the need to implement therapeutic interventions aimed at supporting patients in their return to social life after RP [15, 16, 20], although the results of the current study also indicate an even greater severity of impairment than in those studies.

Analysis of results from the individual symptom scales of the EORTC QLQ-C30 questionnaire indicate that subjects are still struggling with pain, insomnia, and financial difficulties 12 months after surgery, although there is no increase in the scores of these scales, but only a maintenance at a constant level.

On the other hand, when analysing changes in QoL based on the EORTC QLQ-PR25 questionnaire, a clear improvement can be seen on the scale for urinary symptoms, although the scores one year after surgery have still not reached preoperative values. Improvement in the form of a reduction in the severity of incontinence symptoms after RP is also observed in the results of other studies [14, 30]. An indication that, in the present study group, the QoL of men with urinary symptoms improves in the months after surgery is the observed decrease in the value of the median score for use of incontinence aids, with the number of men using such aids remaining constant.

In the case of changes in the quality of sexual life based on the number of subjects declaring sexual activity

at each time point, there is an impression of improvement in the QoL of the men surveyed in this sphere. On the other hand, analysing the results of both functional scales of the EORTC QLQ-PR25 questionnaire one year after RP, the quality of sexual life remains at a low level, which is in accordance with the results obtained in other studies [20, 27, 28].

Among the most important advantages of the present study is the 12-month observation period for changes in QoL, which was conducive to spotting upward or downward trends in individual domains based on a comparison of the results at the various survey time points. In addition, standardised and validated questionnaires developed by organisations recognised in the medical world were used. Also noteworthy is the fact that the study was conducted on a multicentre basis, which allows for a greater degree of generalisation of the results obtained. The study focused on the Polish population of men undergoing this treatment, which represents a kind of update of previous knowledge about the areas and rates of change in quality of life during treatment. The main limitation of the present study is the relatively small group of participants, which means that the results obtained should be interpreted with a great deal of caution in many cases.

CONCLUSIONS

Based on an analysis of changes in QoL over 12 months, conducted on 72 men with PCa and treated with RP, the following conclusions can be drawn:

1. Surgical treatment of PCa leads to clinically significant changes in patients' QoL in many of its dimensions, but at 12 months after surgery most domains return to preoperative levels.
2. The greatest deterioration in the domains of QoL occurs in the first 3 months after surgery and mainly concerns social, emotional, and sexual functioning, as well as symptoms related to incontinence and fatigue.
3. Social functioning, sexual functioning, and urinary symptoms showed the slowest improvement over the 12 months after surgery among all scales and domains of QoL studied.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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ETHICS APPROVAL STATEMENT

The study was approved by the Bioethics Committee of the Medical University of Silesia in Katowice, Poland with approval number: PCN/0022/KB1/11/20.

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