

# Effects of occupational therapy on quality of life of patients with metastatic prostate cancer

## *A randomized controlled study*

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### ABSTRACT

**الأهداف:** تقييم مدى فعالية العلاج الوظيفي مقارنةً ببرنامج البيت التقليدي في تحسين جودة الحياة لدى الرجال الذين يتعالجون من سرطان البروستاتا النقيلي.

**الطريقة:** أُجريت هذه الدراسة في قسم العلاج الوظيفي، كلية العلوم الصحية، جامعة هاسيتيب، أنقرة، تركيا وذلك خلال الفترة من مارس 2012م إلى أغسطس 2014م. وشملت الدراسة 55 ذكراً تم تقسيمهم عشوائياً إلى مجموعتين وهما: مجموعة برنامج العلاج المعرفي السلوكي المعرفي الذي استمر 12 أسبوعاً (مجموعة الدراسة)، ومجموعة العلاج بالمنزل التقليدية (مجموعة الشاهد). ولقد قمنا باستخدام المقياس الكندي لتقييم الأداء الوظيفي من أجل قياس الأداء الوظيفي، وتحديد المصاعب التي يواجهها المشاركون في أنشطتهم اليومية. فيما تم قياس جودة الحياة، ومستوى الأعراض باستخدام استبيان المنظمة الأوروبية لأبحاث السرطان وتحسين جودة الحياة C30، والتي تتضمن وحدة سرطان البروستاتا. ولقد امتدت فترة العلاج المعرفي السلوكي المعرفي 12 أسبوعاً حيث اعتمدت على تدريب المشاركين على كيفية التعامل مع أنشطة الحياة اليومية، بالإضافة إلى الأنشطة الجماعية الترفيهية، والتحكم السلوكي المعرفي بالقلق.

**النتائج:** أشارت الدراسة بأن نتائج المقياس الكندي لتقييم للأداء الوظيفي ونتائج رضا المشاركين والتي تعكس جودة الحياة قد زادت بشكل واضح من الناحية الإحصائية لدى مجموعة الدراسة وذلك بالمقارنة مع نتائج الذكور المشاركين في مجموعة الشاهد ( $p \leq 0.05$ ).

**الخلاصة:** أظهرت الدراسة بأنه يمكن للعلاج المعرفي السلوكي المعرفي المستمر 12 أسبوعاً أن يؤثر على تحسين جودة الحياة لدى الذكور الذين يتعالجون من سرطان البروستاتا النقيلي. وقد كانت هذه التغيرات لدى مجموعة الدراسة مرتبطة بشكل واضح من الناحية الإحصائية مع الأداء الوظيفي.

**Objectives:** To evaluate the efficiency of occupational therapy relative to a home program in improving quality of life (QoL) among men who were treated for metastatic prostate cancer (MPC).

**Methods:** Fifty-five men were assigned randomly to either the 12-week cognitive behavioral therapy based occupational therapy (OT-CBSM) intervention (treatment group) or a home program (control group) between March 2012 and August 2014 in the Department of Occupational Therapy, Faculty of Health Sciences, Hacettepe University, Ankara, Turkey. The Canadian Occupational Performance Measure (COPM) was used to measure the occupational performance and identify difficulties in daily living activities. The QoL and symptom status were measured by The European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire C30 and its Prostate Cancer Module. A 12-week OT-CBSM intervention including client-centered training of daily living activities, recreational group activities, and cognitive behavioral stress management intervention were applied.

**Results:** The COPM performance and satisfaction scores, which indicate occupational participation and QoL increased statistically in the treatment group in relation to men who were included in the home-program ( $p \leq 0.05$ ).

**Conclusion:** A 12-week OT-CBSM intervention was effective in improving QoL in men treated for MPC, and these changes were associated significantly with occupational performance.

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Prostate cancer is one of the most frequent male malignancies in the world.<sup>1</sup> The development of serum prostate-specific antigen (PSA) and advanced prostate cancer treatment modalities increased 10-year survival rates from ~60% to >70%.<sup>2</sup> Prostate cancer can be occurred as a local disease or advanced metastatic disease. The standard of care for metastatic prostate cancer (MPC) is hormone (androgen blockade) therapy, which delays progression and relieves pain for an average of 18 months to 24 months.<sup>3,4</sup> Nearly all patients who have hormone therapy eventually develop significant disease and treatment related morbidity including fatigue, decrease in bone density, bone pain, weight loss, gynecomastia, and hot flushes.<sup>3</sup> Increased survival and subsequent functional, physical, and psychological needs produced a growing acceptance of understanding the rehabilitation needs to increase the occupational performance and quality of life (QoL) of the patients with MPC.<sup>5</sup> Occupational therapy (OT), one of the core elements of oncologic rehabilitation, is in a unique position to contribute to the development and fulfillment of occupational performance and participation with the motto of 'live life to its fullest'.<sup>6</sup> The role of the occupational therapist in oncology is to facilitate and enable an individual to achieve maximum functional performance, both physically and psychologically, in everyday living skills regardless of his or her life expectancy.<sup>6</sup> Occupational performance or participation in everyday occupations is vital for all humans as defined by the International Classification of Functioning, Disability and Health<sup>7</sup> (ICF). Occupational performance has a positive influence on health, well-being, and the presence of cancer has been found to lead to participation in meaningful activities /occupations that are effected by the cancer and its treatments.<sup>8</sup> Previous studies<sup>9-14</sup> have ably identified OT interventions mostly in general oncology and palliative care. The literature on OT, specifically on patients with breast cancer, investigates management of pain, fatigue, nausea, metastatic patients intervention, stress reducing and management program, the value of engagement in meaningful activities, lymphedema, vocational rehabilitation, creative and therapeutic use of activity, cognitive therapy, and, changing life style with cognitive behavioral therapy.<sup>9-14</sup> According to the literature, a survey on women with breast cancer

provides a picture of the interventions employed by the occupational therapists and can help to create an OT service to regain the patients level of control and independence by maintaining or resuming engagement in purposeful occupations and meaningful activities; however, the effect of OT in patients' QoL was not completely specified.<sup>15,16</sup> Another interdisciplinary study recommended examination of the effectiveness of OT in patients' functional needs and to promote evidence-based practice of OT in oncology.<sup>8,17</sup>

Prostate cancer oriented rehabilitation interventions may be valuable in functioning, and activity participation in daily living activities and also in helping men to acknowledge, express, accept, and use a problem solving approach on the changes that occur as a result of treatment and to seek out adaptive solutions for enduring fatigue, bone pain, weight loss, gynecomastia, and hot flushes.<sup>18</sup> Such interventions may lead to significant improvements in functional, cognitive, and emotional coping skills, use of social support, utilization of health care, and management of symptoms.<sup>5,18-21</sup> Rehabilitation interventions were adapted to meet the needs of cancer patients including functional individualized support and group therapy interventions<sup>22</sup> and stress management intervention<sup>23</sup> approaches. The research shows that effective stress management components include relaxation training to lower arousal, disease information and management, an emotionally supportive environment in which participants can address fears and anxieties, behavioral and cognitive coping strategies, and social support.<sup>19,20</sup> Participation in rehabilitation intervention provides a clear and robust benefit to cancer patients by relieving treatment-related symptoms, reducing the physiologic concomitants of stress, and improving mood. Previous study<sup>19</sup> found that the benefits in coping with cancer may be quite significant in male participants.<sup>19</sup> This is supported by the positive experiences that men report from their participation in rehabilitation programs. Although, collectively, these findings indicated that men treated for prostate cancer derive benefit from a rehabilitation experience, most studies did not include a randomized intervention design and did not study the occupational performance of the participants.<sup>15,23</sup> Only a few studies<sup>20,21</sup> have investigated the efficacy of structured stress-management interventions in improving QoL and the mechanisms associated with such improvements despite stressful and negative side effects associated with treatment with limited activity participation.

The limited reports in the literature indicates that there is a lack of study on the effect of OT combined

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cognitive behavioral stress management skills in patients with MPC. In the current study, it was hypothesized that participants treated for MPC enrolled in the cognitive behavioral stress management based OT (OT-CBSM) would demonstrate greater improvements in occupational performance and QoL compared with a control group (CG) enrolled in the home-program. The objectives of this study were to identify the effect of OT-CBSM on occupational participation and QoL, and to explore the areas/activities of daily life that were the most commonly affected, and needed support in patients with MPC.

**Methods.** Inclusion criteria were participants aged  $\geq 50$  years, under hormonal therapy (luteinizing hormone-releasing hormone agonists or maximal androgen blockade therapy) with pathologically confirmed adenocarcinoma of the prostate, stage T3 or T4 with bone metastasis, and no surgical castration history. Disease progression was defined by at least one of the following criteria: detection of a new bone lesion, rising serum PSA under hormone therapy, increased bone pain, or worsening clinical conditions. Participants with localized prostate adenocarcinoma or secondary malignancy, under 5 years education level, and with cognitive impairment or active psychiatric symptoms, including panic attacks, post-traumatic stress disorder, psychosis, or alcohol/drug dependence within the past 3 months were excluded.

The study was conducted according to the Principles of the Helsinki Declaration and approved by the Institutional Review Board of Hacettepe University. Participants completed the evaluation tests one week before and one week after the intervention period. The study enrollment started in March 2012 and was completed in August 2014 in the Department of Occupational Therapy, Faculty of Health Sciences, Hacettepe University, Ankara, Turkey. A randomized, controlled study with 2 level of interventions (treatment or control) and 2 time points (initial and final) was conducted. The study design is shown in Figure 1.

Participants were scheduled for an interview and received more intensive screening, including assessment of cognitive impairment. Participants who scored  $>23$  on the mini-mental status examination<sup>24</sup> were included in the study. Items from the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders<sup>25</sup> (non-patient edition) were used to exclude participants with active suicidal ideation, panic attacks, post-traumatic stress disorder, psychosis, or alcohol/drug dependence.<sup>25</sup> Participants with eligibility criteria and completed the socio-demographic form and

evaluation tests. Cohorts ranging from 3-5 participants were recruited throughout the study. Participants were randomly assigned to either the treatment 12-week OT-CBSM or the control home program by flipping a coin. The control group (CG) was given a written home program after the first evaluation. Treatment group (TG) participants were reassessed in the first week after the 12-week intervention, whereas the control group were reassessed on the third week after their first evaluation to obtain the parallel time period between the pre-intervention and post-intervention assessments in both groups. All the participants were managed by the same master license therapist.

**Treatment group.** Participants were given OT-CBSM in addition to hormone therapy. The 12-week OT-CBSM intervention is a combination of activity training and CBSM for prostate cancer, which was a modified protocol.<sup>20</sup> In the current study, the groups met twice a week for 60 minute (totally 120 minutes/week), which included 30-minute client-centered individualized daily living activity training in the areas of self-care, productivity and/or leisure; 30-minute recreational activity group program; 40-minute didactic CBSM education as well as information related to MPC diagnosis and treatment and 20-minute practical different relaxation technique training.

**Control group.** Participants were given a printed home-program and instructed on the effects of activity training, a recreational activity group program, stress-management skills, and relaxation skills. Participants were encouraged to practice independent self-care, productivity and recreational group activities, and use relaxation techniques of daily living in addition to hormone therapy. No didactic education or active recreational activity group program were provided to the CG.

**Evaluation materials.** To identify the effect of OT-CBSM on occupational participation and QoL; the COPM and The European Organization for Research and Treatment of Cancer (EORTC) Core Quality of Life Questionnaire C30 (QLQ-C30) and its Prostate Cancer Module (EORTC QLQ-PR25), and to explore areas/activities of daily life that were most commonly affected, and needed support for participants with MPC COPM were used.

**Occupational performance.** The COPM was used with a semi-structured interview to measure the participants' self-perception of his occupational performance and identify significant issues causing difficulties in daily activities in the areas of self-care, productivity, and leisure. Accordingly, the participant prioritizes up to 5 problems that are the most urgent

or important and rates each of these problems on an ordinal 10-point scale regarding performance (1 = not able to do it at all and 10 = able to do it extremely well) and satisfaction (1 = not satisfied at all and 10 = extremely satisfied). The mean scores for performance and satisfaction were obtained by adding the ratings of performance and satisfaction over the prioritized problems and dividing them by the number of prioritized problems. Participants were again instructed to re-evaluate performance and satisfaction regarding the prioritized problems of the first COPM interview. The mean scores were compared with the first evaluation scores.<sup>27</sup>

**Quality of life.** The QoL and health related QoL were measured by using The EORTC QLQ-C30 and the EORTC QLQ-PR25. The EORTC QLQ C30 consists of 30 items, which indicate the functions and symptoms of cancer patients. Six multi-item function scales were scored: physical function (PF), role function (RF), emotional function (EF), social function (SF), and global health status (GQoL)/quality of life (QoL). Changes of  $\geq 10$  points on the GQoL/QoL scale were considered meaningful. Nine single-item scales (symptoms) were scored, including fatigue, pain, dyspnea, and gastrointestinal problems. All the scales of the test range from 0-100, in which a higher scale score represents a higher level of functioning. On the single-item scale, a higher score indicates more symptoms or problems.<sup>28</sup> The EORTC QLQ-PR25 is a 25-item prostate cancer specific health related QoL questionnaire developed by EORTC. It has 4 domains, each has a various number of items: urinary symptoms (9 items), bowel symptoms (4 items), hormonal-treatment-related symptoms (6 items), and sexual activity and functioning (6 items). Each item was rated on a 4-point Likert-type scale (1 = very much, 2 = quite a bit, 3 = a little, 4 = not at all). Higher scores indicate better health related QoL (namely, less symptomatic or better functioning).<sup>29</sup>

The data were analyzed using the Statistical Package for Social Sciences version 17.0 (SPSS Inc, Chicago, IL, USA). The group differences were assessed using the Wilcoxon rank sum test. Control variables were incorporated into main analyses if  $p$ -values were  $\leq 0.05$ . Differences between individual cell means within each condition were analyzed using paired-sample Student  $t$  tests. In all cases,  $p$ -values  $\leq 0.05$  indicated statistical significance. The COPM performance and satisfaction scores were assessed by comparing the mean performance and the mean satisfaction scores of the first assessment with the mean scores of the reassessment.

**Results.** In this study, we enrolled 55 male who received treatment for MPC for minimum of 12 months. Nine were unwilling to participate in the study and 12 were excluded as they did not fulfill the inclusion criteria. A total of 34 participants were included in the study (Figure 1). All participants were assigned to either a 12-week OT-CBSM program (TG;  $n=19$ ) or home-program (CG;  $n=15$ ). Table 1 summarizes the mean age, education level, and time span of hormone therapy. According to initial evaluation, the groups were similar (none of the participants characteristics were significantly different) at the 0.05 level (Table 1). The initial evaluation occupational performance (performance score;  $p=0.002$  and satisfaction score;  $p=0.001$ ) and QoL (EORTC-QLQ-C30;  $p=0.001$ ) scores were similar in both groups at the 0.05 level.

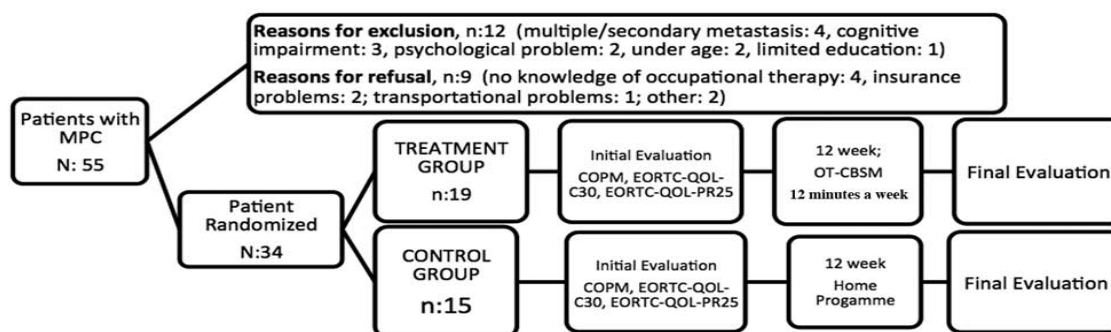
**Occupational performance.** We found significant differences between occupational performance score (COPM; mean performance and mean satisfaction scores) and initial and final evaluation scores in the TG ( $p \leq 0.05$ ; Table 2). Out of the 19 participants, 18 had an improvement (94.7%) and one had no change (5.2%) in the TG. No difference was found between the COPM mean performance and satisfaction scores in the CG ( $p > 0.05$ ; Table 2). The most commonly affected activities that needed support according to the COPM were grooming, pulling up the duvet while in bed, driving a car, getting in and out of the bath, buttoning a shirt and dressing in the self-care category, walking up and down the stairs while carrying materials, typing, visiting other companies, storing groceries, and looking after grandchildren in the productivity category, and doing home repairment, playing outside with children/grandchildren, walking the dog, going to a traditional Turkish cafe (only male goes to have time together, which traditional in Turkey) in leisure category, and other uncategorized examples such as using the telephone and reading newspaper while lying in bed or moving again after a period of inactivity. The participants had a group activity session according to the COPM on the areas of watching movies and preparing a movie booklet, gardening, poetry and preparing poem booklet, art, playing musical instrument, activity planning for grandfather-grandchildren time and making toys, photography and preparing a family album, searching, reading and discussing an area of interest such as theatre, history, or religion. A summary of the EORTC-QLQ-C30 and QLQ-PR25 functional scales and symptom scales are presented in Table 3. The TG participants reported a significant increase in physical functioning, role functioning, emotional functioning, and social functioning compared with the CG ( $p \leq 0.05$ ,



Table 3). The number of participants with an increase from baseline of >10 points on the global health status score, indicating improved QOL was significantly greater in the TG ( $p \leq 0.05$ , Table 3). The initial and final mean QLQ-PR25 scores are presented in Table 3. Sexual activity, urinary symptoms, hormonal treatment-related symptoms were significantly decreased in the TG (Table 3) according to final evaluation.

**Discussion.** There are a few studies that report the positive effects of OT on daily living activities in various cancer populations.<sup>8-10,30</sup> The effects of advanced

OT interventions on QoL in individuals with cancer is still limited. This study tested the extent to which a 12-week OT-CBSM intervention improved perceived activity performance and satisfaction as evidenced by occupational performance and QoL among the participants treated for MPC. In the current study, we found that participation in our OT-CBSM intervention was associated with significant improvement in activity performance and satisfaction level for the activity, which is important for the participant. Additionally, daily living activity training caused improvement in activity performance and satisfaction level. Also, CBSM and



**Figure 1** - Study design among 34 MPC participants. MPC - metastatic prostate cancer, EORTC QLO C30 - The European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire, EORTC QLQ-PR25 - The European Organization for Research and Treatment of Cancer Prostate Cancer Module, COPM - Canadian Occupational Performance Measure, OT-CBSM - cognitive behavioral stress management based occupational therapy

**Table 1** - Characteristics of the participants with metastatic prostate cancer.

Characteristics	Treatment group n=19		Control group n=15		P-value
	Min-Max	Mean±SD	Min-Max	Mean±SD	
Age (year)	50-85	70.89±10.02	61-80	70.27±6.95	0.676
Education level (year)	5-15	10.26±3.57	5-15	10.67±3.45	0.772
Hormone-therapy span (month)	12-24	16.05±3.58	12-26	16.47±4.12	0.847

\* $p \leq 0.05$ , Min-Max - minimum - maximum

**Table 2** - Occupational performance scores (performance and satisfaction scores of COPM).

Occupational performance scores	Treatment group		Control group		P-value
	Min-Max	Mean±SD	Min-Max	Mean±SD	
<b>Performance score</b>					
Initial evaluation	2-5	3.63±0.89	3-6	4.00±0.926	0.912
Final evaluation	5-9	7.11±1.04	1-4	2.47±0.915	0.000*
Z-value		-3.765		-1.000	
Asymp. Sig. (2-tailed)		0.000*		0.317	
<b>Satisfaction score</b>					
Initial evaluation	2-5	3.68±0.74	3-6	4.27±0.961	0.88
Final evaluation	6-9	7.58±0.96	1-4	2.33±0.816	0.000*
Z-value		-3.852		-3.78	
Asymp. Sig. (2-tailed)		0.000*		0.705	

\* $p \leq 0.05$ , Min-Max - minimum - maximum, COMP - Canadian Occupational Performance Measure, Asymp. Sig. -  $p$ -value for initial and final evaluation scores comparison

regular group participation can help stress management. Several studies<sup>8,10,31</sup> have attempted to address this disparity with different cancer groups and suggest that the participant may maximize the impact of occupational performance by activity participation and cognitive behavioral therapy. Some studies<sup>6,12,32</sup> documented the effects of OT on occupational performance, efficacy of stress management interventions in reducing distress, and the negative effect as well as improving global QoL among various cancer populations. Most of these studies have been conducted primarily among population with breast cancer and localized prostate cancer.<sup>4,14</sup> However, some studies<sup>18,20,26</sup> have shown the effectiveness of CBSM interventions in improving, coping, and management skills among men with prostate cancer. In addition, a study reported<sup>23</sup> that male participating in stress management intervention improved across several indices, including mental health and perceived control, and reduced interpersonal conflict and distress associated with cancer-related intrusive thoughts.<sup>33</sup> These studies suggested that rehabilitation interventions on activity participation and stress management are beneficial in this population. According to Zhou's et al<sup>19</sup> and Traeger et al's<sup>20</sup> 10-week CBSM studies, stress

management interventions may improve QoL in males treated for localized prostate cancer. These studies suggested that the sequelae of prostate cancer treatment appears to have impact on QoL despite the fact that males indicate being distressed and bothered by cancer related impairments. Several study<sup>18,33</sup> have attempted to address this disparity, and suggested that men may minimize the impact of prostate cancer on their daily life. We know that individuals who have problems with participation in daily living activities show negative effects and self-image problems with decreased coping skills.<sup>34</sup> Thus, it also may be true that our findings on OT intervention, which include activity training with cognitive behavioral stress management skill education may improve physical role, emotional, cognitive and social functioning and reduce fatigue, dyspnea and insomnia, which may affect activity performance and satisfaction from the view of OT as evidenced by occupational performance and QoL. Consistent with previous studies<sup>19,20</sup> in localized prostate cancer, we found that a 12-week OT-CBSM intervention lead to significantly greater improvements in occupational performance and global QoL of participants with MPC

**Table 3** - Quality of life scores of the participants (EORTC-QLO C30, EORTC-QLO PR-25) treated for MPC.

Quality of life scores	Treatment group		Control group		P-value
	Min-Max	Mean±SD	Min-Max	Mean±SD	
<b>EORTC-QLO C30</b>					
<i>Global health status/QoL</i>					
Initial evaluation	48.00 - 78.00	65.42±7.15	53.00 - 74.00	64.66±5.45	0.000*
Final evaluation	94.00 - 132.00	117.89±8.73	123.00 - 156.00	140.80±9.60	
<i>Functional scales</i>					
Initial evaluation	-49.00 - -9.00	36.68±8.82	-47.00 - -22.00	-36.26±7.93	0.000*
Final evaluation	-8.00 - 15.00	0.57±5.38	-53.00 - -33.00	-41.73±6.14	
<i>Symptom scales</i>					
Initial evaluation	56.00 - 84.00	67.68±9.45	51.00 - 76.00	65.40±8.72	0.02*
Final evaluation	30.00 - 48.00	40.36±5.13	61.00 - 79.00	71.06±4.87	
<b>EORTC-QLQ-PR25</b>					
<i>Sexual activity</i>					
Initial evaluation	0.00 - 66.00	19.00±19.32	33.00 - 83	68.53±17.65	0.00*
Final evaluation	16.00 - 66.00	39.21±12.81	33.00 - 75	68.53±17.65	
<i>Sexual functioning</i>					
Initial evaluation	-33.00 - 83.00	26.73±45.70	-33.00 - 83.00	13.33±48.97	0.541
Final evaluation	-33.00 - 66.00	20.94±40.53	-33.00 - 75.00	10.53±9.38	
<i>Urinary symptoms</i>					
Initial evaluation	37.00 - 91.00	74.57±12.16	54.00 - 83.00	69.53±9.38	0.03*
Final evaluation	32.00 - 81.00	59.89±12.89	37.00 - 79.00	60.53±11.22	
<i>Treatment-related symptoms</i>					
Initial evaluation	0.00 - 83.00	49.21±21.06	66.00 - 91.00	79.66±8.12	0.00*
Final evaluation	0.00 - 85.00	41.42±22.52	66.00 - 91.00	78.60±7.55	
<i>Incontinence aid</i>					
Initial evaluation	33.00 - 94.00	65.26±13.90	38.00 - 72.00	55.13±10.78	0.01*
Final evaluation	36.00 - 83.00	51.89±13.78	2.00 - 83.00	73.53±18.48	

\* $p \leq 0.05$ , Min-Max - minimum - maximum, EORTC QLO C30 - The European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire, EORTC QLQ-PR25 - The European Organization for Research and Treatment of Cancer Prostate Cancer Module

relative to controls. This suggests that our OT-CBSM intervention adequately addressed the global QoL needs and properly targeted activity participation. Our current findings expand prior work<sup>31,34</sup> and suggest that OT-CBSM interventions can improve QoL among participants with MPC. effects of OT-CBSM intervention on prostate specific health related QoL. We found that men who were randomized to our OT-CBSM intervention demonstrated significant improvements in perceived hormone-therapy related problems such as urinary symptoms (limitation of activities due to urinary system, need to remain close to toilet, sleep deprivation due to urinary system), bowel system symptoms (limitation of activities due to bowel system), and treatment related symptoms (hot flushes) from the pre-intervention period to the post-intervention period. These changes were associated with some studies in the literature that shows the positive effects of activity participation and CBSM on therapy related symptoms and health related QoL.<sup>15,29,35</sup> Although our hypotheses were supported statistically,<sup>12</sup> week period of OT-CBSM training and the small sample size gives a sense of pilot study which we thought is the most important limitation of our study. For further studies longer OT-CBSM training period in bigger sample size is recommended. Also, the individuals that participated in our study were psychologically healthy and have no significant cognitive impairment, which limits the generalizability of our findings to more physically and psychologically compromised MPC populations. Although the CG participants received all the education material in written format, the lack of control at home is another limitation of the study.

According to the current literature,<sup>31-33</sup> CBSM helps to reduce levels of stress in the MPC population. We suggest that in addition to the current literature on the effects of CBSM in MPC, OT-CBSM intervention can modify activity participation efficacy, which is the major component of being healthy from the view of ICF on one hand and that improvements in occupational performance are associated with improved QoL on the other. In this study, activity performance and satisfaction, which are a direct indication of occupational performance are improved with an increase in QoL.

In conclusion, OT-CBSM improves occupational participation, which helps to improve the QoL of patients with MPC. Occupational therapy experiences can be used in the development of a clinical practice guideline on the role of OT in assisting individuals with MPC undergoing hormone therapy. It is essential that future studies may include more individuals with different types of cancer to address the long-term impact

of OT on occupational performance, QoL, and disease processes to establish the clinical significance of the benefits of OT among growing number of individuals treated for cancer.

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