

Effect of Occupational Therapy in Patients Receiving Hemodialysis: A Randomized Controlled Study

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Abstract


Objective: Hemodialysis (HD) treatment may have negative effects on the occupational performance and quality of life of individuals. This study was planned to investigate the effect of client-centered occupational therapy (OT) intervention on occupational performance and quality of life in individuals receiving HD.

Materials and Methods: In total, 42 randomly assigned individuals were divided into control (awareness training) and intervention (awareness training and client-centered OT) groups. The Canadian Occupational Performance Measure was utilized to evaluate the occupational performance, and Kidney Disease Quality of Life Short Form was used to assess the quality of life.

Results: Improvement in both occupational performance and quality of life was determined in the intervention group after 8 weeks. In the control group, only the improvement was determined in the general health parameter of quality of life ($p < 0.05$).

Conclusion: OT interventions can contribute to improving occupational performance and quality of life of individuals receiving HD treatment, and these interventions can play an important role in the treatment process of these individuals.

Keywords: Chronic kidney disease, hemodialysis, occupational therapy, quality of life

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INTRODUCTION

Chronic kidney disease (CKD) refers to progressive and irreversible loss of renal function. This condition, which is increasingly recognized as a global public health problem, affects 10-15% of the adult population worldwide (1). In the last stage of CKD, different applications of dialysis may be used as renal replacement therapy. Hemodialysis (HD) is one of the methods used to remove toxic/metabolic waste from the body when the kidneys fail to function normally. Patients undergoing HD receive treatment by means of a dialysis device 2-3 days a week. Sodium-fluid restrictions, special diets, medical appointments, and the HD process produce limitations for individuals with CKD in terms of physical, social, and emotional aspects, rendering them vulnerable and affecting their daily lives (2).

Occupational therapy (OT) is a health profession that through the therapeutic use of daily activities helps individuals to do what they want and need to do and focuses on improving occupational performance (3). OT intervention in HD treatment may be considered as a novel approach aiming to improve quality of life in CKD settings. A limited number of studies in the literature have investigated the effect of OT in patients with CKD (4, 5).

The term client-centered refers to an intervention to the client's perceived ability and needs. Fundamental concepts in client-centered practices include the therapist's and the client's responsibility, autonomy and choice, and partnership. The intervention should meet the individual's resources and goals and also include specific training for the activities in which the person needs and wants to be engaged (6, 7). The importance of cli-



ent-centered practices in individuals with chronic diseases has been emphasized in the literature. In addition, client-centered OT interventions have been associated with improved treatment outcomes (8).

Promoting quality of life is among the most important goals in the treatment of chronic diseases. Although treatment modalities such as dialysis are effective in reducing morbidity and mortality in CKD, treatment outcomes may not always be satisfactory in terms of quality of life. At this point, it is important to focus on the quality of life. Patients undergoing HD often have a lower quality of life than the general population (9). Given the chronic and debilitating nature of end-stage kidney disease, the fact that individuals need long-term dialysis, and the impact of the disease and its treatment on the quality of life, a training program focused on the quality of life appears to be of vital importance. It is crucial to actively involve patients in the treatment program to achieve effective management of disease-related complications and improve the quality of life. In this regard, awareness should be raised among patients; special trainings serve as the most appropriate tool to achieve this goal (10, 11).

There are several studies in the literature investigating the quality of life in patients receiving HD (2, 12). The results of these studies provide information about occupational limitations, loss of role, and decreased quality of life in those receiving this treatment. However, to date, there has been no study to investigate the effect of client-centered OT intervention on occupational performance and quality of life in patients receiving HD treatment. OT uses activities for therapeutic purposes, and engagement in occupations, habits, and roles may positively alter a person's illness experience, leading to functional improvements and improved quality of life (13).

There is no study in the literature examining the effectiveness of client-centered OT in patients receiving HD treatment. Considering this gap, this study was planned to investigate the effect of client-centered OT intervention on occupational performance

and quality of life in patients receiving HD treatment. The results of this study are important in terms of contributing to literature with new information.

MATERIALS AND METHODS

Procedure

This study was planned as a randomized controlled trial. This study has been performed in Trakya University Healthcare, Research and Practice Center Nephrology Department Hemodialysis Unit in 2019. Ethical approval was obtained from the Trakya University School of Medicine Scientific Research Ethics Committee (TÜTF-BAEK 2019/257). An informed consent form was obtained from each participant at the beginning of the study. The study was designed using the CONSORT checklist and flow diagram (14).

Participants

Inclusion criteria included the following: literate, aged 18-65 years, and undergoing HD treatment for at least 1 year. Exclusion criteria included the following: Beck Depression Inventory Score ≥ 17 (15, 16).

Randomization

Individuals who met the inclusion criteria ($n=42$) were stratified into two groups by simple random allocation according to the participant numbers, with a 1:1 allocation ratio. The intervention group ($n=21$) received awareness training on HD followed by client-centered OT, and the control group ($n=21$) received the same awareness training as the intervention group. The flow chart of the study is shown in Figure 1.

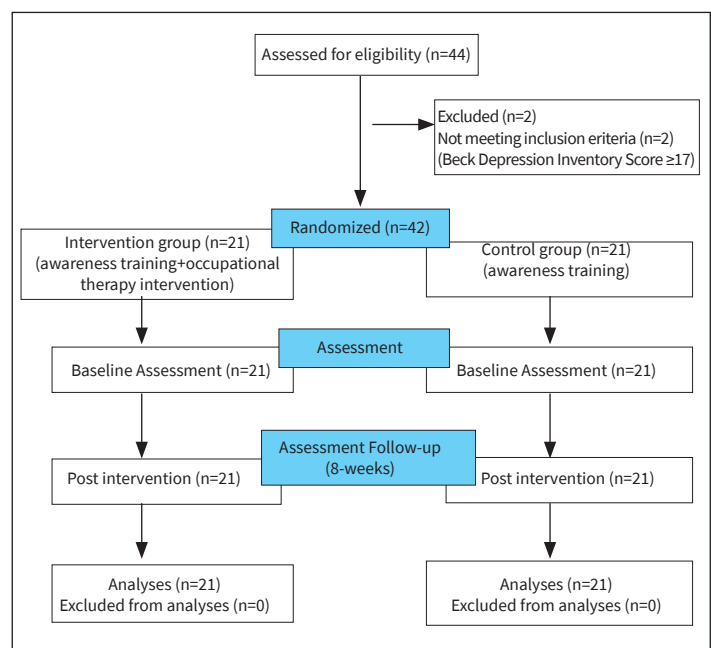


Figure 1. Flow chart showing enrolment and completion of study

Main Points

- Occupational performance and quality of life may be adversely affected in patients receiving hemodialysis (HD) treatment.
- Occupational therapy (OT) is a health profession that through the therapeutic use of daily activities helps individuals to do what they want and need to do.
- A limited number of studies in the literature have investigated the effect of OT in individuals with chronic kidney disease, and this is the first client-centered, randomized controlled study on this subject.
- Occupational therapists can contribute to the improvement of the occupational performance and quality of life of individuals receiving HD treatment.

Data Collection

Sociodemographic characteristics such as age, sex, employment status, education level, duration of HD, and number of HD sessions per week were recorded at baseline.

Canadian Occupational Performance Measure (COPM) (6, 17) is a semi-structured measurement. COPM evaluates the individual's occupational preferences on the basis of self-reported occupational performance and satisfaction scores. In this evaluation, the individual determines problematic activities in self-care and productivity and leisure-time activities that they are able to and wish to perform or have difficulty in carrying out. Subsequently, each activity is assigned a significance value ranging from 1 to 10 by the individual (1-not important at all, 10-very important). Finally, the individual chooses no less than 1 and no more than 5 activities that are most important for them and rates performance and satisfaction scores for each activity (1-10). Mean performance and satisfaction scores are obtained with the sum of the resultant performance and satisfaction scores divided by the number of activities the individual considers important.

Kidney Disease Quality of Life Short Form (KDQOL-36™) was used for the quality of life assessment (18). This scale is used to monitor patients with end stage renal disease and provides a self-rated assessment of well-being and a number of treatment effects. The scale consists of 36 items and 5 subdimensions. The first 12 items cover SF-12, which evaluates physical and mental functions. Items 13-16 assess the burden of kidney disease on the patient's daily life. Items 17-28 evaluate the symptoms of kidney disease and the level of discomfort the patient experiences. Items 29-36 assess the effects of kidney disease on daily life. The score ranges from 0 to 100 in each dimension, with higher scores indicating better health-related quality of life (19).

All assessments were made in both groups at the beginning and end of the study.

Awareness Training and Client-centered OT Intervention

Awareness training and client-centered OT interventions were performed at the HD unit and were limited to the duration of HD session. During the intervention, care was taken to maintain the individuals' arm with arteriovenous fistula in the same position.

Awareness training

At the beginning of the study, awareness training was provided for the individuals in both groups for two sessions, with each session lasting for 45-60 minutes. It was stated at the beginning of the training that individuals could contribute interactively during the training. The content of the training included general information about HD, coping with HD symptoms, cessation of smoking and alcohol consumption, attention to diet, self-care skills, time management, the importance of activities and physical activity, and the importance of social participation.

Intervention

The same awareness training was implemented in the intervention group. In addition, a client-centered OT was performed. The intervention program consisted of four steps: (1) identifying the problems, (2) discussing the problems with the client and creating solution recommendations, (3) decision-making, and (4) applying the recommendations and evaluating the results. Client-centered OT intervention was applied as two sessions per week for 8 weeks, lasting for 45-60 minutes on average. The applications used within the scope of this study were designed with a client-centered and holistic perspective in line with the relevant literature. The therapist planned the intervention program including the client as a decisionmaker in the process and applied it according to the priorities and goals identified by the clients themselves to cover different difficulties in occupational performance components (20). An intervention program content was designed for each client, which included activities to enhance the occupational performance components that were identified by the subjects as important and were treated by them as priority according to the COPM results. The expectations and needs of the client were also taken into account in the content of the program. Examples of interventions applied in this study include fatigue management, pain management, sleep regulation, and improvement in physical and leisure-time activities. When necessary, the subjects were given activity tasks to perform until the next session. Activity tasks were mainly planned for the leisure-time area. Examples of these activities included painting, knitting, playing backgammon, solving puzzles, walking outdoors, going to a picnic, fishing, and visiting a friend. To perform the activity tasks safely and appropriately, the needs related to the designated activity task were determined by interviewing the subject (e.g., do they need someone else's help to visit a friend). Necessary arrangements were implemented considering the identified needs, and the activity was ensured to be performed in a safe and appropriate manner.

All evaluations were repeated after 8 weeks, and the results of the two groups were compared.

Sample Size

Assuming a large difference between the intervention group and the control group with regard to changes in COPM scores (effect size=0.9), calculations revealed the need to enroll no less than a total of 42 subjects, that is, 21 per group for 80% power and 5% type I error level. Sample size calculations were performed with the G-Power 3.1.9.4 program (Franz Faul; Universität Kiel, Germany).

Statistical Analysis

Statistical analyses were conducted with the Statistical Package for the Social Sciences for Windows version 22.0 package program (IBM Corp.; Armonk, NY, USA). Numerical variables were presented as mean±standard deviation and median [25-75th percentiles] values, whereas categorical variables were summarized as number and percentage. Normal distribution of

Table 1. Descriptive characteristics of intervention and control group

Descriptive characteristics		Intervention	Control	Statistical analysis	
		n=21 (%)	n=21 (%)	Statistic	p
Gender	Female, n (%)	6 (28.57)	8 (38.10)	$\chi^2=0.11$	0.74 ^a
	Male, n (%)	15 (71.43)	13 (61.90)		
Resident	Urban area, n (%)	14 (66.67)	13 (61.90)	$\chi^2=0.00$	1.00 ^a
	Rural area, n (%)	7 (33.33)	8 (38.10)		
Education level	Primary school, n (%)	13 (61.90)	15 (71.43)	$\chi^2=0.46$	0.80 ^a
	High school, n (%)	5 (23.81)	4 (19.05)		
	Undergraduate and higher, n (%)	3 (14.29)	2 (9.52)		
Pre-disease employment status	Employed, n (%)	6 (28.57)	8 (38.10)	$\chi^2=0.91$	0.64 ^a
	Unemployed, n (%)	5 (23.81)	6 (28.57)		
	Retired, n (%)	10 (47.62)	7 (33.33)		
Post-disease employment status	Employed, n (%)	1 (4.76)	3 (14.29)	$\chi^2=1.82$	0.61 ^a
	Unemployed, n (%)	7 (33.33)	7 (33.33)		
	Retired, n (%)	12 (57.14)	9 (42.86)		
	Retired because of disability, n (%)	1 (4.77)	2 (9.52)		
Concomitant diseases	Arterial Hypertension, n (%)	11 (52.38)	10 (47.62)	$\chi^2=0.00$	1.00 ^a
	Diabetes Mellitus, n (%)	9 (42.86)	9 (42.86)	$\chi^2=0.00$	1.00 ^a
	Impaired vision, n (%)	7 (33.33)	9 (42.86)	$\chi^2=0.10$	0.75 ^a
	Other, n (%)	5 (23.81)	4 (19.05)	-	1.00 ^b
Smoking	Yes, n (%)	7 (33.33)	11 (52.38)	$\chi^2=0.88$	0.35 ^a
Transportation to the hospital	Car service, n (%)	16 (76.19)	19 (90.48)	$\chi^2=4.42$	0.11 ^a
	Own car, n (%)	2 (9.52)	2 (9.52)		
	Other, n (%)	3 (14.29)	-		
Number of HD sessions per week	Two, n (%)	1 (4.76)	1 (4.76)	-	1.00 ^b
	Three, n (%)	20 (95.24)	20 (95.24)		
Age	Years (X \pm SD)	55.80 \pm 8.59	56.19 \pm 8.10	t=0.15 (df=40)	0.88 ^c
Duration of HD	Months, n (range)	48 (35-90)	48 (36-96)	z= -0.08	0.94 ^c

^aChi-square^bFisher exact test^ct-test in independent groups

df: degree of freedom; HD: hemodialysis; SD: standard deviation

numerical variables was explored by the Kolmogorov-Smirnov test. Equality of group variances was analyzed with Levene's test. In the comparison of the two groups, t-test was used in independent groups in case of parametric assumptions, and Mann-Whitney U test was used otherwise. The Wilcoxon test was employed to determine whether intra-group changes were significant. The relationship between categorical variables was determined by the chi-square test. The significance level was accepted as $p < 0.05$.

RESULTS

Descriptive characteristics of the individuals included in the study were similar in the intervention and control groups ($p > 0.05$) (Table 1).

There was a statistically significant difference in all subdimensions of COPM in post-intervention intra-group evaluations for intervention group ($p \leq 0.01$; 0.01). No significant difference was noted in control group in terms of COPM values after the intervention ($p > 0.05$).

There was a statistically significant difference in all subdimensions of KDQOL-36™ ($p < 0.01$) in pre- and post-intervention intra-group evaluations for intervention group. According to the intra-group quality of life assessment, the largest difference after the intervention was noted in the disease burden ($p < 0.01$). For control group, the intra-group evaluations revealed a statistically significant difference only in SF-12 physical component ($p = 0.01$) and mental component ($p = 0.02$) subdimensions.

	Intervention group (n=21)						Control group (n=21)				Inter-group difference		
	Median [25-75 th percentiles]						Median [25-75 th percentiles]				BI ^b	AI ^b	Difference ^b
	BI	AI	Difference	z (p) (intra-group) ^a	z (p) (intra-group) ^a	Difference	BI	AI	Difference	z (p) (intra-group) ^a			
COPM performance	4 (3-5)	6 (5-7)	2 (1-3)	-3.57 (<0.01)	-3.57 (<0.01)		4 (3-5)	4 (3-5)	0 (0-1)	-1.27 (0.21)	-0.13 (0.90)	-3.86 (<0.01)	-3.94 (<0.01)
COPM satisfaction	4 (3-5)	5 (5-5)	1 (0-3)	-3.44 (0.01)	-3.44 (0.01)		3 (3-4)	4 (3-4)	0 (0-1)	-1.23 (0.22)	-0.67 (0.50)	-4.48 (<0.01)	-3.16 (<0.01)
KDQOL-36™ Symptom subdimension	77.1 (68.8-87.5)	83.3 (72.9-89.6)	4.2 (2.1-6.3)	-3.87 (<0.01)	-3.87 (<0.01)		77.1 (70.8-85.4)	77.1 (71.9-86.5)	0 (0-4.2)	-0.69 (0.49)	-0.37 (0.71)	-0.68 (0.49)	-2.90 (<0.01)
KDQOL-36™ Disease effect subdimension	65.6 (46.9-70.3)	71.9 (57.8-78.1)	9.4 (6.3-12.5)	-3.93 (<0.01)	-3.93 (<0.01)		56.3 (37.5-65.6)	56.3 (43.8-68.8)	0 (0-6.3)	-1.30 (0.19)	-1.27 (0.21)	-2.85 (0.01)	-3.18 (<0.01)
KDQOL-36™ Disease burden subdimension	18.8 (0-43.8)	50 (31.1-68.8)	25 (12.5-37.5)	-3.93 (<0.01)	-3.93 (<0.01)		0 (0-43.8)	12.5 (6.3-43.8)	0 (0-18.8)	-1.19 (0.23)	-1.11 (0.27)	-3.52 (<0.01)	-3.07 (<0.01)
KDQOL-36™ SF12 physical component subdimension	33 (27-43.4)	40.3 (35-47.2)	7.8 (6.1-11)	-3.98 (<0.01)	-3.98 (<0.01)		36 (30-39.8)	40 (30-43.4)	2.8 (0-5.9)	-2.61 (0.01)	-0.55 (0.58)	-1.64 (0.10)	-3.38 (0.03)
KDQOL-36™ SF12 mental component subdimension	37.9 (31.6-48.2)	45.7 (36.7-52.1)	3.6 (2.1-7.0)	-4.02 (<0.01)	-4.02 (<0.01)		37.6 (35.1-46.8)	44 (35.1-47.6)	0.8 (0-6.1)	-2.39 (0.02)	-0.66 (0.51)	-0.79 (0.43)	-2.22 (<0.01)

^aWilcoxon test

^bMann-Whitney U test

AI: after intervention; BI: before intervention; COPM: Canadian Occupational Performance Measure; KDQOL-36 TM: Kidney Disease Quality of Life Short Form; SF12: The Short-Form 12 Health Survey

In post-intervention inter-group evaluations, statistically significant improvement was observed in favor of intervention group for the quality of life subdimensions, disease effect (p=0.01) and disease burden (p≤0.01), and the COPM subdimensions, performance (p≤0.01) and satisfaction (p≤0.01) (Table 2).

DISCUSSION

The purpose of this study was to investigate the effect of client-centered OT intervention on occupational performance and quality of life in patients receiving HD treatment. Results of the study showed that client-centered OT intervention is associated with improved occupational performance and quality of life. On the other hand, providing awareness training alone was observed to improve general health parameters of quality of life, without contributing to occupational performance in other parameters related to quality of life.

To the best of our knowledge, to date, there has been only one study in the literature investigating the effect of OT on the quality of life in patients undergoing HD (4). Currently, there is no randomized controlled study looking at the effectiveness of client-centered OT intervention. Mariotti et al. (4) conducted a study to investigate the effect of OT intervention on the quality of life in individuals receiving HD treatment, demonstrating improved mental health in the OT intervention group in intra-group evaluations. However, at the end of the study, they did not find a statistically significant difference between the intervention and control groups. In the study herein, the group in which the OT intervention was applied showed significant improvement in terms of quality of life and occupational performance in the inter and intragroup evaluations carried out before and after the intervention. In the study by Mariotti et al. (4), the OT program was applied as 30 minute individual sessions twice a week for 5 months. In the study herein, the client-centered OT intervention was applied as two sessions per week for 8 weeks, with each session lasting for 45-60 minutes on average. Therefore, this study had a shorter intervention period than the study by Mariotti et al. (4). On the other hand, individual sessions were longer, and the content of interventions were designed on a client-centered basis. This suggests the importance of the duration of individual intervention sessions and the involvement of the client in the process, rather than the total duration of the intervention. In the literature, a therapy program that includes opportunities for clients to choose from and participate in occupations has been proposed, and client-centered practices have been highlighted (21). Gill and Feinstein (22), on the other hand, emphasized the various meanings attributed to the term, quality of life, and drew attention to the importance of patients demanding their preferences. The

findings of the study herein also support the literature, highlighting the importance of the client's active role in the intervention process.

According to this study, awareness training appears to be effective only in some parameters of quality of life. Another factor that may improve the quality of life is increasing self-efficacy through educational interventions. Bandura (23) states that self-efficacy refers to an individual's belief in their ability to accomplish a particular task. Verbal interview and direct experiences may influence one's belief about their own competences through which individuals can achieve accurate judgment about their abilities and consequently cope better with life problems and illnesses (23). A study investigating the effect of awareness-based cognitive therapy showed that the training program increased the mean score for quality of life and self-efficacy in patients receiving HD (before and after intervention) in each group. Although an increase was noted in the mean scores of quality of life and self-efficacy after the intervention, the post-intervention difference between the two groups (the intervention and the control group) was not statistically significant (24). The findings of this study are also in line with the literature, showing that a statistically significant difference between the groups is observed when awareness training is combined with client-centered intervention.

Although there is only limited information in the literature about the effect of OT on the quality of life in patients receiving HD, the effects of different training and occupation-based interventions have been explored in studies. In a study investigating the effect of self-care training on the quality of life in patients receiving HD (25), self-care training provided significant improvement in general health, physical functioning, vitality, mental health, and the overall health perception. Another study, which looked at the effect of psychosocial intervention on quality of life in patients receiving HD (26), reported significant improvements in quality of life. A study, which evaluated music therapy applied as two sessions a week for a total of eight sessions with an average session length of 75 minutes, associated music therapy with beneficial effects in reducing depressive symptoms and improving quality of life in patients receiving HD (27).

The concept of wellbeing and quality of life is directly related to individuals' ability to engage in meaningful occupations and interact with different environments. In addition to physical factors, psychological factors also affect occupational performance and participation. Law et al. (28) analyzed studies in which individuals had the opportunity to participate in occupations and showed the positive effects of this situation on health and wellbeing. Occupation is considered one of the important components of quality life for people of all ages (29). According to literature reports, humans are occupational beings who will not be healthy in the absence of meaningful and purposeful occupations. Occupational performance or

participation in daily life activities is vital to any individual, as defined by the International Classification of Functioning, Disability and Health (30).

The study findings reported herein reveal that client-centered OT intervention based on occupational participation in line with individuals' needs and demands, as well as medical approaches, may result in improved occupational performance and quality of life in patients receiving HD. Moreover, considering the close relationship between occupation and the concept of quality of life, the improvement in occupational performance parallel to the improvement in quality of life is a finding that is consistent with the literature.

This is the first client-centered, randomized controlled study on this subject. Second, the groups included in this study were similar in terms of descriptive characteristics, which increases the reliability of the results.

Complications and symptoms (e.g. sudden changes in blood pressure) experienced by patients because of CKD and HD treatment also produce a limitation concerning the occupational performance both in hospital setting and at home. Another limitation of this study is the lack of evaluation of long-term effects of the intervention program.

CONCLUSION

In this study, client-centered OT intervention has been associated with the improvement of occupational performance and quality of life. On the other hand, it was observed that providing awareness training alone did not contribute to occupational performance but only led to positive changes in the general health parameters of quality of life.

OT helps individuals of all ages in improving their health and wellbeing or promotes living their life to the fullest by enabling participation in occupations after illness and injury. OT adopts a more active lifestyle and focuses on improving opportunities and conditions to improve the quality of life. Because of the course of the disease and the side effects of treatment, individuals who receive HD treatment usually avoid an active and participatory lifestyle. OT may contribute to improving the quality of life of those receiving HD treatment by encouraging them to participate in meaningful occupations.

The results of this study show that OT intervention programs planned and applied on a client-centered basis should be included in the treatment continuum to improve occupational performance and quality of life in individuals receiving HD treatment.

Ethics Committee Approval: Ethics committee approval was received for this study from the Trakya University School of Medicine Scientific Research Ethics Committee (Approval Date: July 1, 2019; Approval Number: TÜTF-BAEK 2019/257 - NCT04047069).

Informed Consent: Informed consent was obtained from the patients who participated in this study.

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REFERENCES

- Hill NR, Fatoba ST, Oke JL, Hirst JA, O'Callaghan CA, Lasserson DS, et al. Global prevalence of chronic kidney disease-a systematic review and meta-analysis. *PloS One* 2016; 11: e0158765. [\[Crossref\]](#)
- Bezerra KV, Santos JLFJRI-ade. Daily life of patients with chronic renal failure receiving hemodialysis treatment. *Rev Lat Am Enfermagem* 2008; 16: 686-91. [\[Crossref\]](#)
- Clark F, Lawlor MC. The making and mattering of occupational science. Crepeau E, Cohn E, Schell B, eds. *Willard & Spackman's Occupational Therapy*. Lippincott Williams & Wilkins; 2009.p.1-14.
- Mariotti MC, Rocha de JG. Improving quality of life in hemodialysis: Impact of an occupational therapy program. *Scand J Occup Ther* 2011; 18: 172-9. [\[Crossref\]](#)
- Dellê Madalosso F, Mariotti MC. Terapia Ocupacional e qualidade de vida de pessoas com insuficiência renal crônica em hemodiálise/Occupational Therapy and life quality of patients with chronic kidney disease in hemodialysis. *Cad Ter Ocup UFSCar* 2013; 21: 511-520. [\[Crossref\]](#)
- Law M, Baptiste S, McColl M, Opzooomer A, Polatajko H, Pollock N. The Canadian occupational performance measure: An outcome measure for occupational therapy. *Can J Occup Ther* 1990; 57: 82-7. [\[Crossref\]](#)
- Trombly CA, Ma H. A synthesis of the effects of occupational therapy for persons with stroke, Part I: Restoration of roles, tasks, and activities. *Am J Occup Ther* 2002; 56: 250-9. [\[Crossref\]](#)
- Law MJS. Client-centered occupational therapy. SLACK Incorporated; 1998.
- Zazzeroni L, Pasquinelli G, Nanni E, Cremonini V, Rubbi I. Comparison of quality of life in patients undergoing hemodialysis and peritoneal dialysis: A systematic review and meta-analysis. *Kidney Blood Press R* 2017; 42: 717-27. [\[Crossref\]](#)
- Lii YC, Tsay SL, Wang TJ. Group intervention to improve quality of life in haemodialysis patients. *J Clin Nurs* 2007; 16: 268-75. [\[Crossref\]](#)
- Thomas MCJN. Pre-dialysis education for patients with chronic kidney disease. *J Nephrol* 2007; 12: S46-S8. [\[Crossref\]](#)
- D'Onofrio G, Simeoni M, Rizza P, Caroleo M, Capria M, Mazzitello G, et al. Quality of life, clinical outcome, personality and coping in chronic hemodialysis patients. *Ren Fail* 2016; 39: 45-53. [\[Crossref\]](#)
- Moss-Morris R, Petrie K. Illness perceptions: Implications for occupational therapy. *Aust Occup Ther J* 1994; 41: 73-82. [\[Crossref\]](#)
- Piaggio G, Elbourne DR, Pocock SJ, Evans SJ, Altman DG, CONSORT Group. Reporting of noninferiority and equivalence randomized trials: extension of the CONSORT 2010 statement. *JAMA* 2012; 308: 2594-604. [\[Crossref\]](#)
- Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry* 1961; 4: 561-71. [\[Crossref\]](#)
- Hisli N. The validity and reliability of Beck Depression Inventory for university students. *Psikoloji Derg* 1989; 7: 3-13.
- Torpil B, Ekici-Çağlar G, Bumin G. Reliability and validity of the Canadian occupational performance measure in people with multiple sclerosis. *JETR* 2018; 5: 68.
- Joshi VD, Mooppil N, Lim JF. Validation of the Kidney Disease Quality of Life-Short Form: A cross-sectional study of a dialysis-targeted health measure in Singapore. *BMC Nephrol* 2010; 11: 36. [\[Crossref\]](#)
- Yıldırım A, Ogutmen B, Bektas G, Isci E, Mete M, Tolgay H. Translation, cultural adaptation, initial reliability, and validation of the kidney disease and Quality of Life-Short Form (KDQOL-SF 1.3) in Turkey. *Transplant Proc* 2007; 39: 51-4. [\[Crossref\]](#)
- Sumison T. Client Centred Practice in Occupational Therapy. A Guide to Implementation. Churchill Livingstone; 1999.
- Eyres L, Unsworth CA. Occupational therapy in acute hospitals: The effectiveness of a pilot program to maintain occupational performance in older clients. *Aust Occup Ther J* 2005; 52: 218-24. [\[Crossref\]](#)
- Gill TM, Feinstein AR. A critical appraisal of the quality of quality-of-life measurements. *JAMA* 1994; 272: 619-26. [\[Crossref\]](#)
- Bandura A. Perceived self-efficacy in cognitive development and functioning. *Educ Psychol* 1993; 28: 117-48. [\[Crossref\]](#)
- Solati K, Mardani S, Ahmadi A, Danaei S. Effect of mindfulness-based cognitive therapy on quality of life and self-efficacy in dialysis patients. *J Renal Inj Prev* 2018; 8: 28-33. [\[Crossref\]](#)
- Narimani K. A study of the effect of self-care training on the hemodialysis patients' quality of life. *Daneshvar Med* 2009; 16: 63-70.
- Cukor D, Ver Halen N, Asher DR, Coplan JD, Weedon J, Wyka KE, et al. Psychosocial intervention improves depression, quality of life, and fluid adherence in hemodialysis. *J Am Soc Nephrol* 2014; 25: 196-206. [\[Crossref\]](#)
- Hagemann PMS, Martin LC, Neme CMB. The effect of music therapy on hemodialysis patients' quality of life and depression symptoms. *Braz J Nephrol* 2019; 41: 74-82. [\[Crossref\]](#)
- Law M, Steinwender S, Leclair LJC. Occupation, health and well-being. *Can J Occup Ther* 1998; 65: 81-91. [\[Crossref\]](#)
- Green S, Cooper BA. Occupation as a quality of life constituent: A nursing home perspective. *BJOT* 2000; 63: 17-24. [\[Crossref\]](#)
- Jelsma J. Use of the international classification of functioning, disability and health: A literature survey. *J Rehabil Med* 2009; 41: 1-12. [\[Crossref\]](#)