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## Effects of Physical Therapy on the Activities of Daily Living and Life Participation among Hemodialysis Patients

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### ABSTRACT

This study sought to evaluate the efficacy of physical therapy on both activities of daily living (ADLs) and life participation among hemodialysis patients. Modified questionnaires were used for data collection, specifically the Barthel Activities of Daily Living Index and the Kidney Disease Quality of Life Short Form (KDQOL-SF) Survey. Statistical analyses, including Chi-Square and Paired Sample T-test, were utilized to investigate the correlation between patient independence in ADLs and their level of life participation before and during physical therapy treatment. The findings, derived from data collected from a sample of 32 respondents, revealed a statistically significant improvement in patients' independence in ADLs following physical therapy intervention. This underscores the positive impact of therapeutic measures on ADLs. Additionally, a notable increase in the extent of patients' life participation was observed during physical therapy treatment, indicating a significant improvement in this aspect. This study underscores the beneficial effects of physical therapy in enhancing functional abilities, particularly in improving ADLs among hemodialysis patients. It underscores the importance of such interventions in enriching the overall quality of life for individuals undergoing hemodialysis.

### INTRODUCTION

Hemodialysis, an intricate and invasive treatment administered in specialized dialysis centers, significantly alters patients' daily lives. The process often induces weariness and diminishes the capacity to carry out routine activities, primarily due to the prolonged use of medication and associated side effects. Patients undergoing hemodialysis face multifaceted challenges, encompassing adjustments in roles, limitations in life participation, and difficulties in performing activities of daily living (ADLs). The term "activities of daily living" (ADLs) comprises a set of fundamental skills essential for individuals to maintain independence in self-care and include tasks such as eating, bathing, and mobility, which are pivotal components of daily life functioning (Edemekong *et al.* 2019). It encompasses tasks such as requiring assistance from others with bathing or showering, dressing, eating, transferring to and from bed or chairs, utilizing the restroom, accessing the toilet, and navigating within the confines of one's residence. The impairment of ADLs in individuals undergoing hemodialysis is significantly associated with an elevated susceptibility to falls and other unfavorable consequences (Matsufuji & Shoji, 2019). Filipčić (2021) stated that hemodialysis patients had fewer ADLs than otherwise healthy people. Any restriction on physical activity could harm the patient's ability to effectively control their condition and impose high costs on individuals, communities, and healthcare systems by reducing social function and interfering with the patient's ability to perform in their professional and personal capacities.

According to Law (2002), life participation is the capacity to engage in activities such as paid or volunteer labor, household duties, studies, travel, hobbies, family responsibilities, social events, and leisure pursuits. In relation to J. Farragher (2021), individuals receiving chronic hemodialysis recognize that one of the most relevant aspects of their illness experience is fatigue and its adverse impact on their life participation or their capacity to do important daily tasks.

Patients on dialysis focus on getting healthier and completing the tasks that are important to them, which differ for each patient. Some people want to return to work or school, others want to travel, while still others want to be able to complete their chores or go on a walk with their loved ones.

The reduced functional status and musculoskeletal abnormalities of the dialysis population may be influenced by inactivity, which is a common contributor to muscle atrophy Aktas Arslan (2023). Alternatively, uremia itself or associated hormonal abnormalities, such as hyperparathyroidism or growth hormone resistance, may promote muscle atrophy and, as a result, lead to inactivity (Johansen *et al.*, 2000).

The study aimed to evaluate the impact of physical therapy on activities of daily living (ADLs) and life participation among hemodialysis patients across various municipalities within the 1st Congressional District of Bohol. Additionally, it sought to determine whether a significant correlation exists between the level of independence in ADLs and the extent of life participation during physical therapy treatment.

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**LITERATURE REVIEW**

Coping with chronic kidney disease (CKD) presents a myriad of challenges for individuals, as well as their support networks, including caregivers, family members, and friends who are actively involved in their care and well-being (Kalantar-Zadeh 2022). Empowering patients and their care partners is crucial in mitigating the challenges and repercussions of CKD symptoms and facilitating active life participation.

In an 8-week resistance exercise therapy program, Lateef (2022) demonstrates significant improvements across multiple dimensions of physical function, activity levels, and health-related quality of life among patients undergoing hemodialysis for chronic kidney disease. These findings underscore the potential advantages of integrating exercise as a supplementary therapy in the care regimen for individuals undergoing hemodialysis, offering a cost-effective approach to augment their holistic health (Kim, 2022). Participants engaged in exercise exhibited improvements in various indicators of frailty, including gait speed, grip strength, exhaustion, and overall physical performance, alongside enhancements in both mental and physical dimensions of quality of life. These results indicate that incorporating exercise interventions into standard hemodialysis care protocols may be safe and feasible and invaluable in fostering multifaceted enhancements in patients' life participation. The research conducted by Pérez-Domínguez (2021) underscores the effectiveness of both nurse-led intradialytic exercise and home-based exercise programs in bolstering physical function, activities of daily living (ADLs), and health-related quality of life among individuals undergoing hemodialysis. These findings highlight the pivotal role of exercise rehabilitation interventions in augmenting the well-being of vulnerable populations, such as dialysis patients. Additionally, the study emphasizes the feasibility and potential for surmounting barriers to consistently implementing exercise regimens. These outcomes contribute substantively to the expanding body of evidence advocating for exercise as a valuable adjunct therapy in dialysis care, thereby informing clinical rehabilitation protocols aimed at optimizing outcomes for hemodialysis patients.

**METHODOLOGY**

A quantitative descriptive survey research design was used to assess the effects of physical therapy on activities of daily living (ADLs) and life participation. The researchers utilized the modified Barthel Activities of Daily Living (ADLs) and Kidney Disease Quality of Life Short Form (KDQOL-SF) Survey to gather necessary data. The study included 32 respondents from various municipalities in the 1st Congressional District of Bohol. The sample size was determined using an online sample calculator at a 95% confidence level and a 5% margin of error. The reliability statistics indicated a high-reliability result with a Cronbach's Alpha of .907, and the Barthel Index of Activities of Daily Living (ADLs) questionnaire has a reliability score of 0.87 to 0.92.

Data interpretation involved using simple percentages, ranking, weighted mean, and composite mean to analyze respondents' profiles and the nine variables of the Barthel Index of ADLs questionnaire. The Chi-square test was employed to ascertain significant relationships between expected and observed frequencies across one or more domains. Additionally, the Paired Sample T-test was utilized to ascertain significant differences in patients' levels of independence in ADLs and the extent of life participation before and during physical therapy treatment.

**RESULTS AND DISCUSSION**

**Profile of the Respondents.** Regarding age, the majority of respondents (56.3%) were aged between 41 and 60 years old, 25% were 61 years old and above, and 18.8% fell within the 18-40 years old range. Regarding sex, 56.3% were male and 43.8% were female. Regarding occupation, the largest proportion of respondents, 62.5%, were not employed, followed by 18.8% in professional roles, 12.5% working as government employees or clerical workers, and 3.1% craft-related trade workers.

**Table 1: Profile of the Respondents**

Age (y/o)	Frequency	Percent	Rank
18-40	6	18.8	3
41-60	18	56.3	1
61 yrs. old and above	8	25.0	2
Total	32	100	
<b>Sex</b>			
Male	18	56.3	1
Female	14	43.8	2
Total	32	100	
<b>Occupation</b>			
None	20	62.5	1
Professional	6	18.8	2
Technicians and Associate Professionals	1	3.1	4
Government Employees, Clerical Workers	4	12.5	3
Craft-related trade workers	1	3.1	4
<b>Total</b>	<b>32</b>	<b>100.0</b>	

**Level of Independence in ADLs Before and During PT Treatment**

The findings reveal changes in activities of daily living (ADLs) among the respondents undergoing physical therapy. There was a slight improvement in bowel control, evidenced by a decrease in the mean score from 2.96 to 2.81 during therapy. Findings indicate that patients rely on facilitatory techniques, such as the use of suppositories, to aid in bowel removal. A minor improvement in bladder

control was observed, with mean scores decreasing from 3.12 to 3.09 during physical therapy sessions. Patients are dependent on an internal or external device such as catheters to control bladder function.

Meanwhile, grooming activities showed a substantial improvement, with mean scores decreasing from 2.81 to 2.03 during therapy, indicating enhanced independence in grooming tasks. Significant improvements were noted in bathing and feeding activities, as evidenced by the notable decrease in mean scores from 2.90 to 2.18 and 2.62 to 2.00, respectively, during physical therapy. There was a minor improvement in chair/bed transfer activities, with mean scores decreasing slightly from 2.68 to 2.43 during therapy sessions. Slight improvements were observed in ambulation and stair climbing, as indicated by decreases in mean scores from 2.53 to 2.37 and 2.96 to

2.62, respectively, during therapy. Notable enhancements were observed in dressing activities, with mean scores decreasing significantly from 2.65 to 2.06. The composite mean score decreased from 2.80 to 2.40 during physical therapy, suggesting a general improvement in ADLs. These findings underscore the beneficial effects of physical therapy in enhancing various aspects of ADLs among the respondents.

However, it is noteworthy that some activities, such as ambulation and chair/bed transfer, showed only minor improvements, while others, such as bowel and bladder control, remained relatively stable throughout the therapy sessions. These results contribute valuable insights into the effectiveness of physical therapy interventions in promoting independence and quality of life among individuals undergoing hemodialysis.

**Table 2:** Level of Independence in ADLs before and during PT Treatment

ADLs	Before		During	
	Mean	DV	Mean	DV
Bowel Control	2.96	SLI	2.81	SLI
Bladder Control	3.12	SLI	3.09	SLI
Grooming	2.81	SLI	2.03	MI
Bathing	2.90	SLI	2.18	MI
Feeding	2.62	SLI	2.00	MI
Chair/bed transfer	2.68	SLI	2.43	MI
Ambulation	2.53	MI	2.37	MI
Dressing	2.65	SLI	2.06	MI
Stair climbing	2.96	SLI	2.62	SLI
Composite Mean	2.80	SLI	2.40	MI

Legend: Fully independent (FI): 1.0-1.79; Moderately Independent (MI): 1.8-2.59; Slightly Independent (SLI): 2.6-3.39; Less independent (LI) 3.4-4.19; Dependent (D) 4.2-5.0

**Level of Life Participation Before and During PT Treatment**

Patients exhibited a poor level of life participation in their current occupation, with the mean score increasing slightly from 1.5313 before physical therapy to 1.6875 during physical therapy, indicating a minor deterioration in the interference of kidney disease with respondents' current occupation during therapy. Regarding the interference of kidney disease with normal work, the mean score increased from 1.6250 before physical therapy (Poor) to 2.1250 during physical therapy (Fair), suggesting a moderate increase in interference with normal work activities during therapy. In terms of kidney disease interfering too much with their life, the mean score increased from 1.5938 before physical therapy (Poor) to 2.0938 during physical therapy (Fair), indicating a moderate increase in overall life participation during therapy. As for time spent dealing with kidney disease, the mean score increased from 1.2813 before physical therapy (Poor) to 2.1250 during physical therapy (Fair), suggesting a notable decrease in time spent dealing with

kidney disease during therapy. Concerning kidney disease bothering them in their ability to work around the house, the mean score increased from 2.0000 before physical therapy (Fair) to 3.1250 during physical therapy (Good), indicating a significant improvement in the ability to work around the house during therapy.

Regarding kidney disease bothering their ability to travel, the mean score increased from 2.0938 before physical therapy (Fair) to 2.6563 during physical therapy (Good), suggesting a moderate improvement in the ability to travel during therapy. In terms of kidney disease affecting their appearance, the mean score increased from 2.5625 before physical therapy (Good) to 3.2813 during physical therapy (Very Good), indicating a significant improvement in the perception of appearance during therapy. The overall mean score increased from 1.8125 before physical therapy to 2.5593 during physical therapy, suggesting a general improvement in life participation during therapy. Overall, the data suggest that physical therapy has led to improvements in various aspects of life participation among the respondents, particularly in the ability to work

**Table 3:** Level of Life Participation before and during PT Treatment

Items	Before		During	
	Mean	DV	Mean	DV
My kidney disease interferes with my current occupation.	1.5313	Poor	1.6875	Poor
My kidney disease interferes with my normal work (including both work outside the home and household).	1.6250	Poor	2.1250	Fair
My kidney disease interferes too much with my life.	1.5938	Poor	2.0938	Fair
Too much of my time is expended in dealing with my kidney disease.	1.2813	Poor	2.1250	Fair
My kidney disease bothers me in my ability to work around the house.	2.0000	Fair	3.1250	Good
My kidney disease bothers me in my ability to travel.	2.0938	Fair	2.6563	Good
My kidney disease bothers my appearance.	2.5625	Good	3.2813	Very Good
<b>Composite Mean</b>	<b>1.8125</b>		<b>2.5593</b>	

Legend: Very Good: 3.25-4.00; Good : 2.50-3.24; Fair: 1.756-2.49; and Poor: 1.00-1.74

around the house, travel, and appearance. However, some aspects, such as interference with normal work and time spent dealing with kidney disease, showed moderate to notable deterioration during therapy.

**Degree of Correlation between Level of Independence on the ADLs and the Extent of Life Participation During PT Treatment**

The correlation analysis between the level of independence in the activities of daily living (ADLs) and the extent of life participation during physical therapy (PT) treatment yielded the following results. The correlation coefficient between the level of independence on the ADLs and life participation was 0.266. The significance level (2-tailed) was 0.141, demonstrating that the correlation was not statistically significant at the 0.05 level. The positive

correlation coefficient (0.266) suggests a weak positive relationship between the level of independence on the ADLs and the extent of life participation during PT treatment. However, the non-significant p-value (0.141) indicates that this relationship may not be statistically significant in the population from which the sample was drawn. The sample size for both variables was 32, indicating a sufficient number of data points for the analysis.

Based on these findings, while there appears to be a slight positive correlation between independence in ADLs and life participation during PT treatment, the association is not statistically significant at the established significance level of 0.05. Further research with a larger sample size or different methodology may be needed to understand better the relationship between these variables in the population under study.

**Table 4:** Degree of Correlation between Level of Independence on the ADLs and the Extent of Life Participation during PT Treatment

	Activities of Daily Living	Life Participation
Pearson Correlation	1	.266
Sig. (2-tailed)		.141
N	32	32
Pearson Correlation	.266	1
Sig. (2-tailed)	.141	.1
N	32	32

**Degree of Difference in the Patient’s Level of Independence in ADLs Before and During PT Treatment**

The interpretation of the data indicates a significant difference in the patient’s level of independence in activities of daily living (ADLs) before and during physical therapy (PT) treatment. The mean difference between ADL levels before and during PT treatment is 0.39375, with a standard deviation of 0.42346. The standard error of the mean is 0.24108. The statistical analysis, using

a paired samples t-test, yielded a t-value of 5.260 with 31 degrees of freedom, resulting in a p-value of .000. Since the p-value is less than the alpha level of .05, we reject the null hypothesis (Ho) and resolve that there is a statistically significant difference in the patient’s level of independence in ADLs before and during PT treatment. The data suggest that PT treatment has had a significant impact on improving the patient’s level of independence in activities of daily living.

**Table 5:** Degree of Difference in the Patient's Level of Independence in ADLs before and during PT Treatment

ADL before and during PT Treatment	Paired Differences					T	df	Sig. (two-tailed)
	Mean	Std. Deviation	Std. Error Mean	Interval of the				
				Lower	Upper			
	.39375	.42346	0.7486	0.24108	0.54642	5.260	31	.000

Result: Significant Decision: Ho Rejected

**Degree of Difference in the Extent of Patient's Life Participation Before and During PT Treatment**

The interpretation of the data reveals a significant difference in the extent of the patient's life participation before and during physical therapy (PT) treatment. The mean difference between life participation levels before and during PT treatment is -0.6406, with a standard deviation of 0.46894. The standard error of the mean is -0.47155. The statistical analysis, using a paired samples

t-test, yielded a t-value of -7.728 with 31 degrees of freedom, resulting in a p-value of .000.

Since the p-value is less than the alpha level of .05, we reject the null hypothesis (Ho) and deduce that there is a statistically significant difference in the extent of the patient's life participation before and during PT treatment. The data suggest that PT treatment has had a significant impact on improving the extent of the patient's life participation.

**Table 6:** Degree of Difference in the Extent of Patient's Life Participation before and during PT Treatment

Life participation before and during PT Treatment	Paired Differences					T	df	Sig. (two-tailed)
	Mean	Std. Deviation	Std. Error Mean	Interval of the				
				Lower	Upper			
	-0.6406	.46894	0.8290	-.80970	-.47155	-7.728	31	.000

Result: Significant Decision: Ho Rejected

**CONCLUSION**

The findings indicate that physical therapy (PT) treatment has made a significant difference in enhancing patients' independence in activities of daily living (ADLs) and their overall life participation. PT has demonstrated notable improvements in various aspects of life participation among respondents, particularly in their ability to perform household tasks, travel, and their appearance. However, certain areas, such as interference with normal work and the time spent managing kidney disease, exhibited moderate to significant deterioration during therapy. Notably, activities like ambulation and chair/bed transfer saw only marginal enhancements, while functions like bowel and bladder control remained relatively stable throughout the therapy sessions. These outcomes offer valuable insights into the efficacy of PT interventions in fostering independence and enhancing the quality of life for individuals undergoing hemodialysis.

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