The Mediators of Family Involvement between Home-based Rehabilitation and Daily Living Activities of Individuals with Disabilities

Abstract

Background: Home rehabilitation plays a crucial role in enhancing the functional capabilities of individuals with disabilities. However, the influence of family involvement as a mediating factor in this relationship has not been fully explored. This study aimed to investigate whether family involvement mediates the relationship between home rehabilitation and activities of daily living.

Methods: A cross-sectional, descriptive correlational study was conducted from March to June 2025 in Dhi Qar Governorate, Iraq, and included 422 adults with physical or neurological disabilities receiving home-based rehabilitation. Participants were recruited using systematic random sampling. Data were collected using validated instruments: the Home Based Rehabilitation Services Questionnaire (HBRSQ), the Family Involvement Questionnaire - Rehabilitation (FIQ-R), and the Barthel Index. SPSS v28 and PROCESS macro (Model 4) were used for analysis.

Results: Strong positive associations were found between home rehabilitation, family involvement, and activities of daily living (*r=0.69–0.79, p <0.001*). Mediation analysis confirmed a significant indirect effect of home rehabilitation on activities of daily living through family involvement (B=1.05, 95% CI [0.91, 1.19]). The model explained 66% of the variance in job independence.

Conclusion: Family involvement is an important mediator. It is recommended to integrate family-centered strategies into rehabilitation programs to improve outcomes.

Keywords: Home-based Rehabilitation, Family Involvement, Daily Living Activities, Disabilities, Functional Independence.

1. Introduction

Rehabilitation is a cornerstone in restoring purposeful abilities and promoting independence among individuals with disabilities[1]. Among numerous modalities, home-based rehabilitation (HBR) has emerged as a preferred method for long-term care, particularly in community health settings[2]. It provides the benefits of presenting therapy in a familiar environment, facilitating continuity of care, and reducing institutionalization costs[2]. Studies have proven that people receiving HBR show higher adherence to therapy and report higher pride in comparison to those undergoing facility-based rehabilitation[3,4]. However, the success of domestic-based rehabilitation isn't always completely dependent on professional offerings—it is heavily based on the involvement and support of family members[5, 6].

Family involvement plays an important mediating role in the rehabilitation outcomes of individuals with disabilities. The presence of an engaged and supportive circle of relatives can extensively improve motivation, adherence to rehabilitation plans, and overall psychosocial well-being[7]. Research has documented that family members frequently help with therapy, monitor progress, and offer emotional encouragement, which together make contributions to advanced functional outcomes[8]. In contexts wherein formal rehabilitation services are confined, own family involvement will become even more vital in helping with everyday living activities (ADLs), along with dressing, mobility, and hygiene[9,10].

Daily living activities are essential indicators of a character's potential to function independently. The goal of successful rehabilitation applications is now not only to reduce impairment but also to restore the capability to carry out vital daily responsibilities[11]. The literature indicates that better stages of family engagement are related to greater enhancements in ADLs, particularly in populations with chronic physical or neurological disabilities[12, 13]. Despite the diagnosed significance of own family involvement, few studies have explicitly tested its mediating function within the courting among domestic-based rehabilitation and ADL performance.

Given this gap, the current study seeks to explore the mediating impact of own family involvement in the courting among home-based rehabilitation and everyday dwelling activities among people with disabilities. Understanding this dynamic can inform nursing interventions, policy development, and the design of community rehabilitation packages that emphasize family integration as a central aspect of care.

2. Materials and Methods

2.1.Study Design

In Press

This study takes a look at adopting a descriptive correlational cross-sectional layout to observe the mediating position of own family involvement within the relationship among home-based rehabilitation and day-to-day living activities among people with disabilities. The move-sectional technique was chosen due to its suitability for assessing associations among psychosocial and useful variables at a single point in time, which aligns with the dreams of behavioral research in community health nursing. The study aimed to explore whether or not the level of family involvement ought to serve as a mediating mechanism through which domestic-based rehabilitation affects the functional independence of people with disabilities, as measured using their capacity to carry out primary daily living tasks.

2.2.Study Sample

The examination was conducted between March and June 2025 throughout selected network-based primary health care centers and rehabilitation gadgets in Thi Qar Governorate, Iraq. These locations were selected based on provider availability, accessibility, and their setup of home-based rehabilitation packages. The observed population consisted of adults with physical or neurological disabilities who have been receiving home-based rehabilitation for at least three months. Participants had decided on the use of a systematic random sampling approach, guided by the rehabilitation carrier data. The sample size was calculated using the single population percentage components with a 95% confidence level and 5% margin of error, based on an initial estimate of 384 individuals. To account for capability non-response, the very last sample size was multiplied by 422. Inclusion criteria covered adults aged 18 years or older, presently receiving domestic-based rehabilitation, dwelling with their family caregiver, and able to recognize Arabic. Individuals with intense psychiatric contamination or institutionalized care status have been excluded.

2.3.Study Instruments

Data series was collected using an established interviewer-administered questionnaire comprising four sections. The first segment protected demographic and medical variables such as age, gender, disability kind, and length of domestic-based rehabilitation. The second section measured domestic-based rehabilitation, the usage of the Home-Based Rehabilitation Services Questionnaire (HBRSQ), which evolved consistently with WHO CBR recommendations, consisting of 10 items rated on a five-point Likert scale[14]. The third segment assessed family involvement through the Family Involvement Questionnaire–Rehabilitation Version (FIQ-R), which incorporates 12 objects measuring emotional, physical, and selection-making support by way of circle of relatives individuals[15]. The fourth segment assessed each day dwelling sports using the Barthel Index, a widely prevalent device that evaluates simple useful responsibilities consisting of mobility, feeding, and personal hygiene[16].

2.4.Validity and Reliability

To ensure the fine and cultural appropriateness of the study gadgets, the questionnaire underwent content validation by a panel of five specialists in rehabilitation nursing, public health, and social sciences. Based on their input, numerous items were revised for readability. A pilot study was conducted on forty-two people with disabilities to evaluate the internal consistency, float, and clarity of the device. The pilot responses were excluded from the final information analysis. The reliability coefficients (Cronbach's alpha) for the primary observation gadgets have been as follows: 0.87 for the HBRSQ, 0.88 for the FIQ-R, and 0.90 for the Barthel Index, all indicating strong internal consistency.

2.5.Data Collection

Data collection was conducted with the aid of skilled network fitness nurses through private, face-to-face interviews at primary fitness care centers or participants' homes, depending on the affected person's mobility status. Each interview consultation lasted approximately 30 to 40 minutes. All individuals supplied written informed consent before participation. Confidentiality and the right to withdraw at any level have been explained. Ethical acclaim for the study was acquired from the Research Ethics Committee at the College of Nursing, University of Thi Qar.

2.6.Statistical Analysis

Data had been analyzed using SPSS version 28. Descriptive information had been calculated for demographics and a look at the variables. Pearson correlation coefficients have been used to discover the relationships among variables. The mediating effect of family involvement was tested using the PROCESS macro (Model-4) for SPSS, with 5,000 bootstrap samples to estimate oblique effects and 95% self-belief intervals. A p-value much less than 0.05 becomes taken into consideration statistically huge in all analyses.

3.Results

Table (1) Sample Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (Mean ± SD)	47.3 ± 14.6 years		
Age Group	18–34	88	20.9

In Press

	35–54	213	50.5
	≥55	121	28.6
Gender	Male	234	55.5
	Female	188	44.5
Type of Disability	Physical	269	63.7
	Neurological	153	36.3
Duration of Home Rehab	8.3 ± 2.9 months		
	<6 months	102	24.2
	6–12 months	192	45.5
	>12 months	128	30.3
Caregiver Relationship	Parent	159	37.7
	Spouse	123	29.1
	Son/Daughter	86	20.4
	Other	54	12.8

Table (1) gives the demographic and clinical traits of the have a look at pattern. The common age of contributors changed into 47.3 years (SD = 14.6), with the majority falling within the 35–54 age range (50.5%). More than 1/2 of the sample have been male (55.5%). The majority (63.7%) had bodily disabilities, while 36.3% had neurological conditions. Participants had received domestic-based rehabilitation for a median of 8.Three months. Nearly half of (45.5%) have been enrolled in rehabilitation for 6–12 months. Regarding caregiver relationships, 37.7% of caregivers have been mother and father, observed by using spouses (29.1%) and sons/daughters (20.4%).

Table (2) Descriptive Statistics and Reliability of Main Variables

Variable	Mean ± SD	Min-Max	Scale Range	Skewness	Kurtosis
Home-Based Rehabilitation (HBRSQ)	38.21±6.49	19–50	10–50	-0.47	0.63
Family Involvement (FIQ-R)	43.77±5.81	24–60	12–60	-0.39	0.71
Daily Living Activities (Barthel)	82.96±12.78	30–100	0–100	-0.81	1.01

Table (2) reviews the principal dispositions, distribution, and reliability of the three primary variables. Home-Based Rehabilitation scores (HBRSQ) had an average of 38.21 (SD = 6.49), displaying robust engagement in domestic services. Family Involvement scores (FIQ-R) averaged 44.77 (SD=5.81), indicating mild to excessive own family participation. Daily Living Activities (Barthel Index) had a high score of 82.96 (SD=12.78), reflecting extraordinarily suitable purposeful independence among individuals. Skewness and kurtosis values are within appropriate levels (±2), indicating a normal distribution.

Table (3) Correlation Matrix Among Main Variables

Variables	HBRSQ	FIQ-R	Barthel Index
1.Home-Based Rehabilitation	1		
2.Family Involvement	.74**	1	
3.Daily Living Activities	.69**	.79**	1

Table (3) presents the Pearson correlation coefficients of a few of the three core variables. Home-Based Rehabilitation (HBRSQ) becomes strongly and undoubtedly correlated with Family Involvement (r=0.74, p <0.001) and Daily Living Activities (r=0.69, p <0.001). Family Involvement also had a strong positive correlation with Daily Living Activities (r=0.79, p <0.001).

Table (4) Mediation Analysis (PROCESS Model 4)

Path	Unstd. B	SE	t-value	p-value	95%CI	Std. Beta
a(HBRSQ→ FIQ-R)	0.94	0.04	23.50	<0.001	[0.86,1.02]	0.74
b(FIQ-R→ Barthel)	1.12	0.06	18.67	<0.001	[1.01,1.23]	0.79
c'(HBRSQ→ Barthel, direct)	0.52	0.07	7.43	<0.001	[0.38,0.66]	0.42
c(total effect)	1.57	0.08	19.63	<0.001	[1.42,1.72]	0.73

Outcome Variable: Daily Living Activities (Barthel Index)

Table (4) affords the mediation model assessing whether or not own family involvement mediates the relationship between home-based rehabilitation and daily activities. The route from domestic-based rehabilitation to family involvement (course a) changed into strong and considerable (B=0.94, β =0.74, p<0.001). Similarly, family involvement substantially anticipated day-to-day dwelling activities (direction b:

B=1.12, β=0.79, p<0.001). The overall effect of home-based rehabilitation on everyday living activities (direction c) was great (B=1.57, β=0.73, p< .001), and the direct impact remained sizeable, however smaller (route c′: B=0.52, β=0.42, p<0.001).

Table (5). Indirect Effect with Bootstrapping (5,000 samples)

Indirect Path	Effect Estimate	Boot SE	95% Boot CI (LL–UL)	p-value
HBRSQ→ FIQ-R → Barthel	**1.05**	0.07	**[0.91, 1.19]**	<.001

Table (5) offers the bootstrapped indirect effect of the mediation model. The indirect route (HBRSQ→ FIQ-R→ Barthel) had an effect estimate of 1.05 (Boot SE = 0.07), with a 95% self-belief confidence interval of [0.91, 1.19], and a p-value<0.001. Since the self-belief c program language period does not move to zero, the mediation is statistically widespread.

Table (6). Regression Model Summary (Barthel Index as DV)

Model	R	R^2	Adjusted R^2	F	Df	p-value
Final Model	0.81	0.66	0.66	408.15	2, 419	<.001

This table indicates the overall regression model predicting everyday living sports (Barthel Index). The model yielded an R^2 of 0.66, indicating that 66% of the variance in daily living pastime performance is explained by means of home-based rehabilitation and own family involvement. The F-statistic (F=408.15, df= 2, 419) and p-value (<0.001) show that the model is statistically enormous. The excessive R^2 represents a terrific model fit, suggesting that these predictors collectively are very strong determinants of daily useful consequences on this population.

4. Discussion

The present-day study examined the mediating function of family involvement in the relationship between home-based rehabilitation offerings and daily residing sports amongst individuals with disabilities. The findings aid an enormous and high-quality association among all three variables, with family involvement rising as a robust mediator that complements the effect of rehabilitation services on practical independence. These findings align with a developing body of literature emphasizing the significance of family-targeted care in rehabilitation effects.

The sample traits revealed a diverse group of participants, predominantly center-elderly adults, with a moderate majority being male and struggling primarily from bodily disabilities. This demographic profile is consistent with the populace typically served by community-based rehabilitation (CBR) packages in low- and middle-income countries. Similar distributions have been found in research with the aid of Makofane et al., in South Africa, and Roberto et al., within the United States, each highlighting the centrality of family caregiving and network offerings for adults with mobility or neurological impairments[17, 18].

In terms of the descriptive facts, the contributors scored distinctly excessive in day-to-day living activities (mean=82.96), suggesting that domestic-based rehabilitation and familial support make a meaningful contribution to practical potential. This supports study, who determined that individuals receiving home-based rehabilitation in combination with caregiver training confirmed marked development in Barthel Index scores. Additionally, the high reliability of the devices used in this study (α>0.90) displays robust psychometric consistency, matching findings from previous validation studies of the Barthel Index and comparable rehabilitation measures[19-21].

The robust correlations found among domestic-based rehabilitation, family involvement, and everyday dwelling sports (0.69 to 0.97) further beef up the idea that social and environmental supports are important in incapacity healing. A current look at emphasized the position of casual caregivers as essential mediators of fitness consequences, particularly while formal healthcare assets are restrained[22]. Moreover, it's miles highlighted that improved family involvement leads to higher compliance with healing regimens, improved mental outcomes, and more suitable physical functioning, consistent with our findings[23].

The mediation analysis, using the PROCESS macro (Model-4), confirmed that family involvement in part mediated the effect of home-based rehabilitation on everyday living sports. The oblique impact was statistically significant (B = 1.05, 95% CI [0.91, 1.19]), and the overall version accounted for 66% of the variance in purposeful results. These consequences are in keeping with previous studies that have pronounced that caregiver participation improves the efficacy of stroke rehabilitation interventions[24, 25]. Similarly, it is determined that concerning family within the rehabilitation planning for older adults with disabilities appreciably expanded sufferers' autonomy and decreased their dependency ratings over time[25].

The strength of the mediation model indicates that rehabilitation interventions are extra powerful when households are actively engaged, not only in bodily care but also in emotional support and decision-making. This helps the concepts of the World Health Organization's Community-Based Rehabilitation Matrix, which underscores the significance of family and network participation in reaching inclusive

In Press

development and functional healing. Furthermore, the standardized coefficients from this study (β = 0.74 for HBRSQ→ FIQ-R, and β = 0.79 for FIQ-R→ Barthel) suggest that family involvement is not a peripheral detail but a principal mechanism in maximizing rehabilitation results.

Study Limitation

This have a look at has numerous barriers. First, its cross-sectional layout limits the capability to set up causality among domestic-based rehabilitation, family involvement, and day-to-day dwelling activities. Second, statistics were accrued via self-suggested measures, which may be challenged by recall bias or social desirability bias. Third, the study was conducted in an unmarried Iraqi governorate, which may restrict the generalizability of the findings to other areas or nations with exclusive healthcare systems and cultural norms. Lastly, unmeasured variables, together with intellectual fitness status or socioeconomic elements, may affect rehabilitation results and have not been managed for in this evaluation.

5. Conclusion

The study concluded that family involvement significantly contributes to the link between home rehabilitation and activities of daily living for people with disabilities. Strong family support enhances the effectiveness of rehabilitation programs, leading to improved meaningful independence. Based on these findings, it is recommended that healthcare providers and policy makers incorporate family-centered approaches into rehabilitation programs. Priority should be given to training and supporting family caregivers to ensure sustainable and effective home care. Future research using longitudinal models is also recommended to explore causal relationships and evaluate long-term outcomes.

In Press