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An Analysis On The Impact Of Hemodialysis On The Quality Of Work Life Of Renal Patients: A Case Study Of Coimbatore District

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ABSTRACT
The study investigates the quality of work life among 300 haemodialysis patients in Coimbatore district, focusing on their physical, psychological, social, and environmental wellbeing. Using factor analysis and model validation techniques, the research highlights severe work-life disruptions, emotional distress, and social isolation experienced by patients. The analysis revealed strong construct validity and internal consistency, with key concerns related to nutrition, mental alertness, treatment burden, and inadequate infrastructure. The findings underscore the urgent need for holistic care approaches and targeted policy interventions to improve the life quality of chronic kidney disease patients.

Keywords: *Chronic illness, Renal disease, CKD patients, Haemodialysis, Coping mechanisms, Workplace adaptation, Chronic kidney failure.*

INTRODUCTION

There has been increasing number of patients who have chronic kidney disease. Though there are advanced clinical treatment, above all the patients of renal disease face sever level of stress in all aspects of affecting their work, social activities, contraction in the food intake, regular activities or routine which all lead to psychological distress. These mental health challenges are not only common but also clinically significant, as they are strongly correlated with increased morbidity and mortality, reduced quality of life, shortened life expectancy, and, alarmingly, suicidal ideation in some cases. Hence, there is a need to understand the views of the patients on their quality of work life and in the present research it is attempted to examine the work life quality of 300 patients selected from Coimbatore district. The study indicated a poor quality of work life among the patients.

HEMODIALYSIS AND ITS IMPACT ON QUALITY OF WORK LIFE

In recent times the incidence of chronic kidney disease (CKD) has been increasing continuously all over the world. A comprehensive analysis from the Global Burden of Disease Study (1990–2021) found that the incidence of chronic kidney disease (CKD) has risen steadily across the globe. Absolute new cases increased from approximately 7.8 million in 1990 to nearly 19 million by 2019, with an average annual percent change (AAPC) of about 1.82% . The upward trend has been consistent across all socio-demographic regions—low, middle and high income alike (Kaili Qin,2024). Thus, the Global incidence of CKD has climbed continuously over recent decades, with new cases nearly doubling between 1990 and 2019. This rise has occurred across both developed and developing regions (Jiaxi Chen et.al., 2025). This is driven primarily by advances in medical treatment and the progressive aging of the population. In relative terms, the incidence of chronic renal failure is estimated at 242 individuals per one million population (Espahbodi et.al.2015), and healthcare systems worldwide are expending over $1 trillion annually on the management of end-stage renal disease (ESRD) (Wouters,2015).

The clinical management of chronic renal failure typically follows a two-stage approach: Conservative management in the early and moderate stages, and Renal Replacement Therapy (RRT) in the advanced or end-stage phase (Espahbodi et.al.2015). he major treatment for renal failure is the Hemodialysis. It remains the most widely adopted method for renal replacement in the case of End Stage

Renel Disease (ESRD) patients. It includes dialysis and kidney transplantation, with hemodialysis being the most commonly utilized modality. Hemodialysis is a life-sustaining therapy designed to replicate the essential functions of the kidneys. Using a specialized dialysis machine, it filters the patient's blood to remove excess fluids, electrolytes, and metabolic waste products that would otherwise accumulate in the absence of normal kidney function (Wouters,2015). This process temporarily restores biochemical balance and reduces uremic symptoms, thus prolonging life in patients with end-stage renal disease.

In spite of the fact that it is life-sustaining nature, hemodialysis is inherently demanding and poses significant stress in all aspects of a patient's life (Aydede, 2014). On the medical side, patients are typically required to undergo treatment three times a week, with each session lasting three to five hours. This is really a painful treatment. Patients on hemodialysis must also deal with various health-related problems like cardiac illness, gastrointestinal conditions, etc., which also lower their quality of life (Kousoula, 2015). The frequent or routine hospital visit also imposes substantial disruptions to patients' daily lives, affecting their work, social activities, and overall lifestyle (Cukor etal.2008). This requires rigorous time management, dietary and fluid restrictions, and adaptation to a chronic medicalized routine, making it not only a physical burden but also a profound psychological and social challenge. Thus, the hemodialysis patients experience various changes in their daily life that includes contraction in the food intake, regular activities or routine, and above all leading to psychological distress including the changes in the employment. These mental health challenges are not only common but also clinically significant, as they are strongly correlated with increased morbidity and mortality, reduced quality of life, shortened life expectancy, and, alarmingly, suicidal ideation in some cases (Kousoula, 2015). Thus, there tampers the previously held roles and responsibilities, undermining their autonomy and overall quality of life. Studies indicate that the psychology of the patients with dialysis is that when patients first begin receiving dialysis, they might initially believe that their kidneys would recover and dialysis will end. However, as time goes on and they continue receiving dialysis, their fears grow and negatively affect their quality of life (Eker et.al.2000).

Though the increase in the life expectancy of the renal patients is the prime aim, it goes beyond survival through medical treatment as they require social support in various forms. These include enhancing the patients' overall well-being—psychological, social, and emotional. Within this framework, social support has emerged as a pivotal component in ensuring effective disease management and improved health outcomes (Theofilou, 2013). Social support, broadly defined as the provision and receipt of assistance during crises, typically originates from family members, friends, healthcare providers, peer groups, and other significant sources within the patient's social network (Theofilou, 2013).

Empirical evidence consistently supports the positive influence of social support in chronic disease management. It has been linked to reduced depression levels, enhanced stress coping, better adherence to therapeutic regimens, improved quality of life, greater access to healthcare services, and even direct physiological benefits through immune system modulation (Cohen,2007). However, despite these known associations, the specific interplay between psychological factors such as anxiety and depression and the availability or perception of social support in hemodialysis patients remains underexplored in systematic research.

The research studies on the determinants of quality work life of hemodialysis patients identified the factors like, the Physical Health, the Psychological Health, the social Relationships and the Environmental Factors. (Bushra Akram et.al. 2023).

PROBLEM DESIGN

India has a high prevalence of chronic kidney disease (CKD), which is estimated to affect 17 per cent of the population (Varughese, 2018). The rising incidence of CKD is expected to create major problems in India for the healthcare providers in the future (Singh et.al.2013). The study by Singh et.al. (2013) also indicated that the number of people undergoing dialysis in India increases on the average by 100,000 every year.

Thus, with the increasing number of patients there is a need to understand the quality of life of the patients and to provide them social and familial support together with the medical support. Hence, there is a need to understand the quality of life of the hemodialysis patients and the present research is directed towards this end. The present study is carried out in the context of Coimbatore district which has the highest number of health centres which run by both private and government. However, there are no studies carried out in the context of the study area that have examined the quality of life of the patients undergoing hemodialysis. The present study bridges this gap.

MATERIALS AND METHODS

The prime focus of the present study is to identify the opinion on the factors determining the level of stress among the renal patients undergoing hemodialysis. For this purpose, 300 patient respondents were selected at convenience from 10 multispecialty hospitals where hemodialysis is done. 30 patients from each of the hospitals were selected. These hospitals include two government hospitals and 28 private hospitals. The data were collected at a rate of five three patients a day. The collected data were analyzed using simple percentage and factor analysis.

ANALYSIS AND INTERPRETATION OF RESULTS

This table presents the demographic and socio-economic characteristics of the 300 respondents. The majority (80%) are male, which is consistent with clinical evidence suggesting a higher prevalence of end-stage renal disease (ESRD) among men. The age distribution shows that most respondents fall between the 40–60 age range, particularly 35% in the 40–50 group and 27% in the 50–60 group, indicating that middle-aged individuals are predominantly affected.

Education-wise, over half (51%) are graduates, suggesting that a significant proportion of the dialysis population is educated. Urban residents form the majority (63%), likely due to better access to dialysis facilities in urban regions. A large portion of respondents are married (87%), which may indicate the availability of family support in managing the disease.

Employment data reveals that only 7% remain employed, whereas 71% are unemployed. This unemployment is largely attributed to the burden of chronic illness and the need for frequent dialysis sessions, which disrupt the ability to maintain regular work. This not only impacts individual income but also constitutes a potential economic loss at the national level in terms of lost productivity. Further, 46% of the respondents have been on dialysis for 5 to 10 years, establishing the chronic nature of the disease in this sample.

TABLE:1 DISTRIBUTION OF SAMLE RESPONDENTS BY SOCIO ECONOMIC PROFILE			
SL.NO.	PROFILE	NO. OF RESPONDENTS	PERCENTAGE
I.	GENDER DISTRIBUTION		
1	Male	240	80.00
2	Female	60	20.00
II.	DISTRIBUTION OF AGE (in Years)		
1	Less than 20	3	1.00
2	20-30	15	5.00
3	30-40	45	15.00
4	40-50	105	35.00
5	40-50	81	27.00
6	50-60	42	14.00
7	60-70	6	2.00
8	Above 70	3	1.00
III.	LEVEL OF EDUCATION ATTAINEMNT		
1	Schooling not completed	3	1.00
2	Schooling completed	102	34.00

3	Graduation	153	51.00
4	Above Graduation	52	14.00
IV.	**LOCATION**		
1	Rural	111	37.00
2	Urban	189	63.00
V.	**MARITAL STATUS**		
	Unmarried	9	3.00
	Married	261	87.00
	Widowed	12	4.00
	Divorced/separated	18	6.00
IV.	**DISTRIBUTION OF OCCUPATION**		
1	EMPLOYED	21	7.00
2	Unemployed	213	71.00
3	House wife	51	17.00
4	Students	15	5.00
V.	**ANNUAL INCOME OF THE FAMILY (IN RS.LAKHS)**		
1	Less than 2	12	4.00
2	2-5	108	36.00
3	5-10	141	47.00
4	10-15	27	9.00
5	Above 15	12	4.00
VI.	**Duration of undergoing Haemodialysis**		
1	Less than 1 year	30	10.00
2	1-5	96	32.00
3	5-10	138	46.00
4	10-15	12	4.00
5	Above 15	24	8.00

FACTOR ANALYSIS

Having discussed the socio-economic background of the sample respondents, in the present and in the subsequent paragraphs it is attempted to study the impact and the crucial determinants of quality work life of patients. The reason behind using the factor analysis is to understand or to identify the most relevant variables that determine the factors of quality of work life.

TEST OF RELIABILITY

The Cronbach's Alpha value of 0.748 for the 20-item scale confirms acceptable internal consistency of the instrument. This indicates that the items used to measure the constructs—particularly physical health and related aspects—are reliably understood and responded to by the patients. A value above 0.7 is generally considered acceptable for exploratory research.

TABLE:2
Reliability Statistics

Cronbach's Alpha	N of Items
0.748	20

The Kaiser-Meyer-Olkin (KMO) value is 0.819, which is well above the minimum threshold of 0.6, indicating sampling adequacy for factor analysis. The Bartlett's Test of Sphericity is statistically significant (Chi-square = 3087.309, $p < 0.001$), confirming that the correlation matrix is not an identity matrix and that factor analysis is appropriate. These results validate the decision to proceed with the extraction of underlying factors.

TABLE:3 KMO Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.819
Bartlett's Test of Sphericity	Approx. Chi-Square	3087.309
	Df	300
	Sig.	.000

Four components have been extracted, cumulatively explaining 67.35% of the total variance. This is a strong indication that the factor structure captures most of the variation in the data. Each component contributes meaningfully, with the first factor accounting for 19.14% of the variance, followed by 17.19%, 16.20%, and 14.81% from the subsequent factors. This supports the existence of multiple, well-defined dimensions in the physical well-being framework of dialysis patients.

TABLE:4
TOTAL VARIANCE EXPLAINED

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Components	Total	Percentage Variance	Cumulative Percentage	Total	Percentage Variance	Cumulative Percentage	Total	Percentage Variance	Cumulative Percentage
1	3.829	19.144	19.144	3.829	19.144	19.144	3.584	17.921	17.921
2	3.438	17.19	36.334	3.438	17.19	36.334	3.422	17.111	35.032
3	3.242	16.209	52.544	3.242	16.209	52.544	3.233	16.167	51.199
4	2.961	14.805	67.349	2.961	14.805	67.349	3.23	16.149	67.349

COMPONENT MATRIX

To identify the most influencing variable the coefficient values below 0.40 has been suppressed. That is, the coefficients which have higher than 0.40 are considered for further analysis. In the extraction, all the 20 variables are found to have the component values of above 0.40. This matrix reveals the factor loading pattern of the 20 observed variables across four latent constructs. The physical health indicators such as fatigue, mobility issues, appetite, and treatment-related discomforts load strongly on the first factor. Psychological health indicators—anxiety, depression, acceptance, mental clarity—are grouped under the second factor with strong loadings above 0.8.

Social relationship variables like isolation, family interactions, and support are captured in the third factor. Environmental factors—including safety of the dialysis center, access to services, and financial resources—load on the fourth factor. The high loadings (most above 0.8) confirm strong convergent validity within each construct.

	TABLE:5 ROTATED COMPONENT MATRIX[a]				
		Component			
Sl.No.	FACTORS	1	2	3	4
1	I feel exhausted or physically weak after my dialysis sessions.	0.82			
2	I experience muscle cramps, nausea, or other discomforts due to dialysis.	0.867			
3	I am able to manage my daily tasks despite my treatment schedule.	0.825			
4	My appetite and nutrition support my health needs effectively.	0.867			
5	I experience limitations in mobility because of my illness or treatment.	0.836			
6	I often feel anxious or depressed about my health condition.		0.828		
7	I worry about the long-term outcomes of being on dialysis.		0.819		
8	I have emotionally accepted my illness and adjusted to dialysis treatment.		0.827		
9	I feel mentally alert and clear-headed most days.		0.84		
10	I feel emotionally supported by my healthcare providers during treatment.		0.817		
11	My illness has reduced the quality of my interactions with family and friends.			0.819	
12	I receive consistent emotional and physical support from loved ones.			0.794	
13	My dialysis schedule makes me feel isolated or excluded from social events.			0.838	
14	I am able to maintain close relationships despite my health issues.			0.766	
15	I feel that others' behavior toward me has changed because of my illness.			0.789	
16	The dialysis center I attend is clean, safe, and adequately equipped.				0.844
17	I can access dialysis services without undue difficulty or financial burden.				0.871
18	I have a comfortable place to rest and recover after treatment.				0.821
19	I have sufficient financial resources to manage treatment-related expenses.				0.796
20	I have access to accurate information and counseling about dialysis care.				0.664
	Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 5 iterations.				

Thus, given the relevance of the variable, the next step is the understanding of the how observed variables relate to underlying constructs. The diagramme given below represents the hypothesised relationship between the observed variables and the construct. The arrow shows the direct of the relationship. That is, from the latent variable to the observed variables. The estimated values of the relationship through the regression model, is provided in Table 6. It is to be noted that as provided in the theory so as to avoid the problem of un-identification, one variable that is the first observed variable in each of the latent variable is scaled. Hence, for the remaining 20 the regression coefficients are estimated and discussed here.

The confirmatory factor analysis (CFA) results presented in the table provide strong empirical support for the underlying measurement model assessing various dimensions of quality of work life. Each observed variable is clearly associated with its respective latent construct, and the standardized regression weights (factor loadings), standard errors, critical ratios (C.R.), and significance levels (P-values) offer detailed insight into the strength and consistency of these relationships.

The regression weights derived through the confirmatory factor analysis (CFA) model provide insight into the relative importance and strength of each observed indicator in explaining its respective latent construct. These standardized estimates are crucial for validating the measurement model, especially in the context of patients undergoing long-term haemodialysis, whose quality of life is multi-dimensionally affected.

Within the latent construct of Physical Health, five indicators were included. Among these, the items “My appetite and nutrition support my health needs effectively” and “I experience muscle cramps, nausea, or other discomforts due to dialysis” both recorded the highest regression weight of 1.054. This suggests that patients perceive dietary sufficiency and physical symptoms as the most critical aspects of their physical condition while on dialysis. Closely following are “I am able to manage my daily tasks despite my treatment schedule” (0.994), “I feel exhausted or physically weak after my dialysis sessions” (0.941), and the baseline indicator “I experience limitations in mobility because of my illness or treatment.” The significant strength of these estimates (all with p-values < 0.001) confirms that physical strain and discomfort from treatment not only diminish the ability to function but also define the overall physical well-being of patients. These findings reinforce that physical capability and freedom from symptoms are essential to maintaining a sense of health among individuals undergoing dialysis.

In the latent variable on Psychological Health, the indicator “I feel mentally alert and clear-headed most days” carries the highest estimate of 1.035. This highlights how cognitive clarity remains a crucial psychological concern among dialysis patients, who often experience fatigue-induced brain fog or confusion. The variables “I have emotionally accepted my illness and adjusted to dialysis treatment” (1.026), “I often feel anxious or depressed about my health condition” (0.996), and “I worry about the long-term outcomes of being on dialysis” (0.996) also hold high statistical weights. These results show that emotional responses to illness, including stress, acceptance, and clarity, are deeply integrated into the patients' psychological experiences. The psychological toll of chronic illness—especially the uncertainty of long-term outcomes—plays a significant role in shaping their emotional stability and mental well-being.

For Social Relationships, the highest loading was observed for “My dialysis schedule makes me feel isolated or excluded from social events” at 1.076. This finding reveals a key psycho-social consequence of regular dialysis: it restricts patients’ ability to engage with society, amplifying feelings of social disconnection. Other indicators such as “My illness has reduced the quality of my interactions with family and friends” (1.029), “I receive consistent emotional and physical support from loved ones” (0.991), and “I am able to maintain close relationships despite my health issues” (0.931) also emerged with strong regression weights. These suggest that while patients suffer from reduced social interactions due to time-consuming treatment regimens, family support remains a buffering factor in their experience of social isolation. However, the cumulative evidence points toward an erosion of social involvement, which may further impact mental health over time.

In the Environment domain, “I can access dialysis services without undue difficulty or financial burden” had a strong estimate of 1.025. This indicates that logistical and financial access to treatment remains a central environmental factor shaping the overall care experience. Closely related are items such as “The dialysis center I attend is clean, safe, and adequately equipped” (baseline), “I have a comfortable place to rest and recover after treatment” (0.942), and “I have sufficient financial resources to manage treatment-related expenses” (0.910). These show that patients place high importance on infrastructure, affordability, and safety. "I have access to accurate information and counselling about dialysis care" recorded a relatively lower weight of 0.682, suggesting that while information is relevant, it may not be perceived as urgent as tangible access and infrastructure in the eyes of long-term dialysis patients.

To sum up, the regression weights not only confirm the strong factorial validity of each latent construct but also point toward the daily struggles of dialysis patients in maintaining their physical health, emotional stability, social connectedness, and environmental support. The fact that all regression estimates are statistically significant and range above the commonly accepted threshold demonstrates the strength and reliability of the measurement model. These insights reinforce the multidimensional impact of haemodialysis and can inform patient-centered strategies to improve the quality of life in chronic kidney disease care.

The confirmatory factor analysis (CFA) conducted for this study yielded an exceptionally strong model fit, reinforcing the validity of the proposed four-construct framework used to assess the impact of haemodialysis on patients' physical well-being. The chi-square value was statistically significant with a p-value of less than 0.001, which is common in large-sample models but does not on its own suggest poor fit due to sensitivity to sample size. To further verify the model's fitness, multiple other indices were examined.

TABLE:6 REGRESSION WEIGHTS OF LATENT VARIBALES

Sl.No.	Observed Variable	Direction	Latent Variable	Estimate	S.E.	C.R.	P
1	I experience limitations in mobility because of my illness or treatment.	<---	Physical Health	1.000			
2	My appetite and nutrition support my health needs effectively.	<---	Physical Health	1.054	.067	15.805	***
3	I am able to manage my daily tasks despite my treatment schedule.	<---	Physical Health	.994	.070	14.169	***
4	I experience muscle cramps, nausea, or other discomforts due to dialysis.	<---	Physical Health	1.054	.067	15.728	***
5	I feel exhausted or physically weak after my dialysis sessions.	<---	Physical Health	.941	.067	14.092	***
6	I feel emotionally supported by my healthcare providers during treatment.	<---	Psychological Health	1.000			
7	I feel mentally alert and clear-headed most days.	<---	Psychological Health	1.035	.074	13.889	***
8	I have emotionally accepted my illness and adjusted to dialysis treatment.	<---	Psychological Health	1.026	.076	13.477	***
9	I worry about the long-term outcomes of being on dialysis.	<---	Psychological Health	.996	.075	13.286	***
10	I often feel anxious or depressed about my health condition.	<---	Psychological Health	.996	.074	13.461	***

11	I feel that others' behavior toward me has changed because of my illness.	<---	Social Relationship	1.000			
12	I am able to maintain close relationships despite my health issues.	<---	Social Relationship	.931	.083	11.195	***
13	My dialysis schedule makes me feel isolated or excluded from social events.	<---	Social Relationship	1.076	.083	12.953	***
14	I receive consistent emotional and physical support from loved ones.	<---	Social Relationship	.991	.082	12.038	***
15	My illness has reduced the quality of my interactions with family and friends.	<---	Social Relationship	1.029	.083	12.347	***
16	The dialysis center I attend is clean, safe, and adequately equipped.	<---	Environment	1.000			
17	I can access dialysis services without undue difficulty or financial burden.	<---	Environment	1.025	.064	15.890	***
18	I have a comfortable place to rest and recover after treatment.	<---	Environment	.942	.067	14.010	***
19	I have sufficient financial resources to manage treatment-related expenses.	<---	Environment	.910	.069	13.214	***
20	I have access to accurate information and counseling about dialysis care.	<---	Environment	.682	.070	9.794	***

SUMMARY OF MODEL FIT

The Goodness-of-Fit Index (GFI) was reported at 0.98, while the Adjusted Goodness-of-Fit Index (AGFI) stood at 0.91. Both values exceed the conventional thresholds for good model fit, thereby confirming that a substantial proportion of variance in the data is explained by the model. The Normed Fit Index (NFI) and Tucker Lewis Index (NNFI), also referred to as the Non-Normed Fit Index, were reported at 0.98 and 0.957 respectively. These values indicate that the specified model represents a significant improvement over the null model and suggest high comparative efficiency.

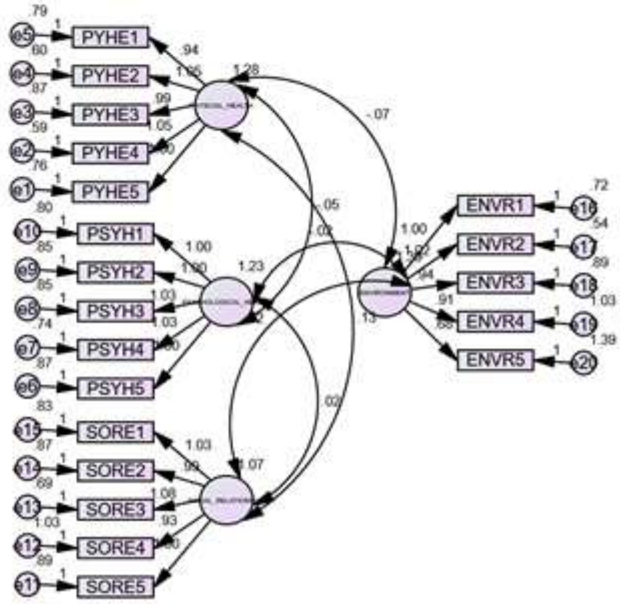
In terms of parsimony-adjusted measures, the Comparative Fit Index (CFI) was observed at 0.966, which is well above the threshold of 0.90, affirming the strong alignment of the hypothesized model with the observed data. The Root Mean Square Error of Approximation (RMSEA) was found to be 0.045, and the Standardized Root Mean Square Residual (SRMR) was 0.067. Both fall comfortably within acceptable limits, suggesting that the residuals between the predicted and actual data matrices are minimal. Additionally, the Average Variance Extracted (AVE) for the latent constructs was recorded at 0.58, surpassing the recommended minimum of 0.50. This indicates that the constructs in the model explain a substantial portion of variance in their corresponding items.

Altogether, these results validate the structural integrity of the model and support its application in measuring the physical well-being dimensions of patients undergoing long-term dialysis. The indices collectively confirm that the model is both statistically sound and practically robust, offering a valid framework for further empirical analysis and intervention design in nephrology-focused health research.

TABLE:7
SUMMARY RESULTS OF MODEL FITNESS OF CONFIRMATORY FACTOR ANALYSIS

	Measure	NAME	Description	Cut off for good fit	Index value	Decision
	X^2	Model Chi Square	Assess overall fit and the discrepancy between the sample and fitted covariance matrices. Sensitive to sample size. H0: The model fits perfectly.	p-value less than 0.05	0.000 (DF - 165)	Fit
	(A)GFI	(Adjusted) Goodness of Fit	GFI is the proportion of variance accounted for by the estimated population covariance. Analogous to R^2. AGFI favors parsimony.	GFI > 0.95 AGFI >0.90	GFI – 0.98 AGFI – 0.91	Fit
	(N)NFI TLI	(Non) Normed- Fit Index Tucker Lewis index	An NFI of .95, indicates the model of interest improves the fit by 95% relative to the null model. NNFI is preferable for smaller samples. Sometimes the NNFI is called the Tucker Lewis index (TLI)	NFI > 0.95 NNFI > 0.95	NFI - 0.98 NNFI - 0.957	Fit
	CFI	Comparative Fit Index	A revised form of NFI. Not very sensitive to sample size. Compares the fit of a target model to the fit of an independent, or null, model.	CFI >.90	0.966	Fit
	RMSEA	Root Mean Square Error of Approximation	A parsimony-adjusted index. Values closer to 0 represent a good fit.	RMSEA < 0.08	0.045	Fit
	(S)RMR	(Standardized) Root Mean Square Residual	The square-root of the difference between the residuals of the sample covariance matrix and the hypothesized model. If items vary in range (i.e. some items are 1-5, others 1-7) then RMR is hard to interpret, better to use SRMR.	SRMR <0.08	0.067	Fit
	AVE (CFA only)	Average Value Explained	The average of the R^2s for items within a factor	AVE >.5	0.58	Fit

Output towards the model



SUMMARY AND CONCLUSION

This study systematically explored the physical, psychological, social, and environmental well-being of patients undergoing long-term haemodialysis, using robust statistical tools including exploratory and confirmatory factor analysis.

The socio-economic profile of the respondents revealed that the majority were middle-aged, urban-dwelling males, most of whom were married and educated. However, only a meagre 7% remained employed. The severe disruption to work life caused by the time and health demands of dialysis has forced many individuals to quit their jobs, resulting in not only personal financial loss but also contributing to a wider economic productivity gap.

Reliability statistics confirmed strong internal consistency in the measurement instrument (Cronbach's Alpha = 0.748), while KMO and Bartlett's tests verified the suitability of the data for factor analysis. The extracted components captured over 67% of total variance, indicating strong construct representation in the selected indicators.

The rotated component matrix grouped 20 observed variables meaningfully under four latent constructs. Items with high loadings reinforced the severity of physical discomfort, emotional stress, social isolation, and infrastructural concerns faced by haemodialysis patients.

Regression weights further underscored the strength of specific indicators. For physical health, nutrition and symptoms like cramps emerged as dominant concerns. For psychological health, mental alertness and emotional acceptance of illness were critical. Social isolation due to treatment schedule was the strongest social burden, while financial and infrastructural access were the most significant environmental concerns.

Finally, the CFA model demonstrated excellent fit across all indices validating the structure and strength of the proposed model. The model effectively captured the real-world experience of patients and serves as a strong tool for further applied research or policy intervention in nephrology care.

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