An explorative study to assess the factors influencing well-being of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis at dialysis units of selected hospitals of Bagalkot

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Abstract: Background: Kidneys are paired organ, occupying the lower position in the body and performing the upper most roles in homeostasis. Nowadays, chronic kidney disease (CKD) has been increasing due to various factors. Chronic Renal Failure is defined by the level of kidney function and the evidence of kidney damage. End Stage Renal Disease (ESRD) is a known increasing public health concern globally. The irreversible advanced CKD leads to End Stage Renal Disease (ESRD) where there is permanent loss of kidney function causing extreme mortality rates among this population[1] Objective: Find the factors influencing wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis. Methods: This cross-sectional study included a sample of 100 patients with End Stage Renal Disease (ESRD) undergoing hemodialysis at Hanagal Shri Kumareshwar Hospital and Research Centre, Bagalkot and District Government Hospital, Bagalkot. Data were collected using self report method and Hospital's records. Tools used for data collection were; socio-demographic questionnaire, Ryff's Psychological Wellbeing scale and Centre for Epidemiologic Studies Depression Scale (CES-D Scale), Generalized Anxiety Disorder Scale – 7 (GAD-7). Multiple linear regression analysis was performed to find the significant predictors of Psychological Wellbeing. Results: A significant regression equation was found ($F_{16, 99}$=4.5, R^2=0.46, P=0.000). Social Support has positively predicted the Psychological Wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis. Depression and Anxiety was the strongest negative predictors of Psychological Wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis. Conclusion: Interventions aimed at management of depression, anxiety and strengthening of social support among patients with End Stage Renal Disease (ESRD) undergoing hemodialysis would result in enhancement their Psychological Wellbeing.

Keywords: Wellbeing, Patients with End Stage Renal Disease (ESRD), Hemodialysis.

Introduction

Kidneys are paired organ, occupying the lower position in the body and performing the upper most roles in homeostasis. Kidneys once damaged can't revert to normal completely, even with enough external interventions.[1] More than 500,000 people in the United States live with end-stage renal disease (ESRD). The development of chronic kidney disease (CKD) and its progression to this terminal disease remains a significant cause of reduced quality of life and premature mortality.[2]. In India studies have shown that up to 0.8% of the population may suffer from chronic kidney disease thereby putting the number at about 8 million of the 1 billion population[3]. The approximate prevalence of CKD is 800 per million population (pmp) , and the incidence of end-stage renal disease (ESRD) is 150-200 pmp[4]. End-stage renal disease, also called end-stage kidney disease or kidney failure, occurs when chronic kidney disease — the gradual loss of kidney function — reaches an advanced state. In end-stage

renal disease, your kidneys no longer work as they should to meet your body's needs. A patient with end-stage renal failure must receive dialysis or kidney transplantation in order to survive for more than a few weeks[5]. According to the National Center for Chronic Disease Prevention and Health Promotion, about 30 million people, or 15% of adults, in the U.S. are estimated to have chronic kidney disease. Chronic kidney disease can often be treated before it progresses to end-stage renal failure or leads to other health problems[5]. One of the issues presenting in ESRD patients is the well Being. Well-being is something greater than not being ill. That's to say, having logic, independence, and self-confidence can be defined as well-being. Well-being is a multidimensional procedure which includes mental, social, physical, and emotional health. The presence of stress in life can be attributed to various factors. One of the well-being aspects is social aspect.[6] Chronic kidney disease (CKD) has been recognized as a leading public health problem worldwide. The global estimated prevalence of CKD is 13.4% (11.7-15.1%), and patients with end-stage kidney disease (ESKD) needing renal replacement therapy is estimated between 4.902 and 7.083 million. The global increase in this disease is mainly driven by the increase in the prevalence of diabetes mellitus, hypertension, obesity, and aging. But in some regions, other causes such as infection, herbal and environmental toxins are still common.[7]

In India there is a rising burden of chronic disease like hypertension and diabetes. The increase in number of CRF patients can be partially attributed to the epidemic of chronic diseases and the aging population. India has the largest number of diabetics in the world with prevalence of 3.8% rural and 11.8% in urban adults.[8] Moreover, hemodialysis can have negative effects on general health and well-being of the patients; in addition, it can have negative influence on physical performance, mental status, and social relationships. Hemodialysis complications are not limited to physical and mental aspects, but they include economical aspect as well. Identifying well-being aspects including mental, social, physical, emotional, spiritual, and subjective aspects should be taken into consideration in order for the patients to be able to achieve their goals[9].

Methods

It was a cross sectional study included a sample of 100 patients with End Stage Renal Disease (ESRD) undergoing hemodialysis at Hanagal Shri Kumareshwar Hospital and Research Centre, Bagalkot and District Government Hospital, Bagalkot. A sample was selected by Purposive sampling technique The final Sample size was determined with the help of power analysis using data from pilot study. As the number of determinants included in the study is 17 and 10 to 15 patients with ESRD undergoing hemodialysis visit at selected hospital everyday considering this in order to improve the credibility of predictor analysis sample size for the present study was 100. **Study participants:** The study participants were patients with ESRD undergoing Hemodialysis aged above 20 years at selected hospital of Bagalkot. The sampling criteria included the patients with ESRD undergoing hemodialysis at selected hospital of Bagalkot., patients aged above 20 years and able to complete the survey, who can understand, read and write Kannada/English, patients who are fit enough to provide data and who are willing to participate in the study. Who are extremely ill and unable to provide data, who are not willing to give informed consent, patients are on peritoneal dialysis and those with mental instability were excluded from enrolment in study sample. **Sample size calculation:** The final Sample size was determined with the help of power analysis. The sample size was calculated considering the following criteria, Z = 1.96 (95% confidence level), margin of error (e) =5% (0.05), Population proportion (P) = 0.5. The population of patients with ESRD in Karnataka was considered around 34.7%. The calculated sample size was 100. The researcher enrolled 100 subjects and data was obtained from 100 subjects.

Setting of the study: The study was conducted at the Dialysis units of selected hospital of Bagalkot; HSK Hospital and research centre Bagalkot, District hospital Bagalkot, Subhash Patil hospital Bagalkot. The researcher enrolled 100 patients with ESRD undergoing haemodialysis from the selected hospital. **Data collection Instrument:** The data regarding depression is to assess the depression among the patients with ESRD undergoing Haemodialysis which consists of 20 items. It is developed by Center for Epidemiological Research Studies. Anxiety among patients with ESRD was measured using General Anxiety Disorder: 7 Scale which has got 7 items. Psychological wellbeing was measured using Ryff's scale, a 14-item scale and it is 7-point scale that assesses the Psychological wellbeing among patients with ESRD undergoing HD. **Validity, reliability and translation of data collection instruments:** Ryff's Wellbeing scale has been widely used in many Indian languages including Kannada with very high reliability (Chronbach's α 0.907). Reliability for the Kannada translated tool in the present study was established by Test-retest method and split-half method. In Test-retest method, the 7 days gap was given between the tests and

correlation between the scores was calculated by using Cronbach's alpha value. Internal consistency was established by using split-half method, since there are 31items in the tool, 'Spearman-Brown r' for unequal length was calculated. Reliability established for Kannada tool Cronbach's α (Test-retest method) is 0.923 , Spearman – Brown (Split-half method) is 0.961 . which indicates the tool is highly reliable. Center Epidemiological Research Studies- Depression Scale was (CES-D) is highly reliable with high internal consistency with Cronbach's alpha ranging between 0.88- 0.97. CES-D has been widely used in Indian setting also especially in patients with End Stage Renal Disease (ESRD) undergoing hemodialysis researches with high internal consistency. Reliability for the Kannada translated tool in the present study was established by Test-retest method and split-half method. Reliability established for Kannada tool Cronbach's α (Test-retest method) is 0.962, Spearman – Brown (Split-half method) is 0.913 . which indicates the tool is highly reliable. The Generalized Anxiety Disorder Scale-7 (GAD-7) for assessment of anxiety. Reliability for the Kannada translated tool in the present study was established by Test-retest method and split-half method. Reliability established for Kannada tool Cronbach's α (Test-retest method) is 0.943 , Spearman – Brown (Split-half method) is 0.971 . which indicates the tool is highly reliable, suggesting the tool was reliable for data collection.

Ethical clearance: Ethical clearance certificate was obtained from Institutional ethical clearance committee, B.V.V.S Sajjalashree Institute of Nursing sciences, Bagalkot (ref No. BVVSSIONS-IEC/2022/23/192. Dt: 09/05/2022) Written consent of participation was obtained from participants and their parents before data collection.

Statistical analysis: the data was analysed using SPSS version 25. The obtained data was entered in MS excel sheet. The data was edited for accuracy and completeness. The categorical responses were coded with numerical codes. The data was presented with frequency and percentage distribution tables and diagrams. Frequency and percentage distribution were used for analysis of socio demographic and clinical characteristics. The description of Patients with ESRD undergoing haemodialysis was presented with mean, standard deviation of Psychosocial factors (Depression. Anxiety) and psychological wellbeing scores of Patients with ESRD undergoing Haemodialysis Spearman's Rank order correlation to find relationship between psychosocial factors and psychological wellbeing. Multiple linear regression analysis to find predictors of Psychosocial Factors and psychological wellbeing among Patients with ESRD undergoing haemodialysis.

Data collection Procedure: The data was collected study was conducted from 01-02-2023 to 20-06-2023 among 100 Patients with ESRD undergoing haemodialysis. Prior formal administrative approval from the Principal of Sajjalashree institute of nursing science, Bagalkot. Obtained approval from institutional ethical clearance committee. Obtained administrative approval from concerned authorities of Dialysis unit of selected hospitals of Bagalkot. All the participants were explained about the purpose of study and that the data or information provided from them will be kept confidential and their identity will not be revealed. The written consent from patients with ESRD undergoing haemodialysis. Assessment of Psychosocial factors and psychological wellbeing among Patients with ESRD undergoing haemodialysis. The instruments were given according to their preferred language (English or Kannada). Instructions were given regarding content of data collection instruments. The researcher attained and clarified the doubts of participants during data collection. The filled tools were collected from the participants. On an average adolescents took 20 to 30 minutes to fill the tools and the whole process was completed in 1 hour. Researcher thanked all the participants.

Results

The percentage wise distribution of sample according to their age describes that most of the patient with ESRD undergoing hemodialysis (37%) were from age group 30 - 40 and 41 to 50 years. (66%) were males. (74%) of them belonging to Hindu religion. (81%) of them were married. Area of residence reveals that majority of the patient undergoing hemodialysis (64%) were from rural area. (39%) of were educated Up to 10 standard, (32%) of them were House wife, (72%) were belonging to Joint family, (65%) were having income of below 10000, (59%) were in their first to second year of life, (85%) were having average social support, (59%) were having the frequency of biweekly dialysis, (52%) were do not have any other disease and (67%) were having average self-care ability.

Table1: Socio-demographic and clinical characteristics of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis.

n= 100

Variables	Frequency	Percentage
Age		
a) <30years	16	16%
b) 30 - 40 years	37	37%
c) 40 - 50 years	31	31%
d) Above 50 years	16	16%
Gender		
a) Male	66	66%
b) Female	34	34%
Religion		
a) Hindu	74	74%
b) Muslim	20	20%
c) Christian	6	6%
Educational status		
a) Illiterate	29	29%
b) SSLC	39	39%
c) PUC	28	28%
d) Degree & above	4	4%
Marital status		
a) Married	81	81%
b) Un married	19	19%
Area of Residence		
a) Urban	36	36%
b) Rural	64	64%
Occupation		
a) House wife	32	32%
b) Agriculture	25	25%
c) Coolie	16	16%
d) Employed	16	16%
e) Self Employed	11	11%
Family monthly income		

a)	<10000	65	65%
b)	10000 - 20000	29	29%
c)	20000 - 30000	4	4%
d)	>30000	2	2%
Type of family			
a)	Joint	72	72%
b)	Nuclear	27	28%
Social Support			
a)	Poor	3	3%
b)	Average	85	85%
c)	Good	12	12%
Since from how long you are on dialysis			
a)	< 1 year	19	195
b)	1 - 2 years	59	59%
c)	3- 4 years	19	19%
d)	Above 4 years	3	3%
Frequency of dialysis			
a)	Weekly	13	13%
b)	Bi weekly	59	59%
c)	Tri weekly	28	28%
d)	Monthly & Above	0	0%
Do you have any other disease ?			
a)	Yes	48	48%
b)	No	52	52%
Self-care ability			
a)	Poor	2	2%
b)	Average	67	67%
c)	Good	31	31%

Abbreviations: **F**: Frequency, **%**: Percentage

Part-II: Assessment of Psychological wellbeing among patients undergoing Hemodialysis.

Distribution of sample according to their psychological wellbeing describes that Majority of patients undergoing haemodialysis have Moderate Psychological wellbeing (51%).

The mean, SD, Maximum score and Minimum score of psychological wellbeing of Patients Undergoing hemodialysis. is 96, Minimum score is 54. The Total Psychological wellbeing mean and SD Depression of Patients Undergoing hemodialysis score is 82.63 ± 9.9.

Part-III: Assessment of Psychosocial Factors (Depression, Anxiety) among patients undergoing Hemodialysis with Psychological wellbeing of patients with ESRD undergoing hemodialysis.

Distribution of sample according to their Level of Depression describes that Majority of patient undergoing hemodialysis (81%) were clinically significant depressed. The mean and SD Depression of Patients Undergoing hemodialysis score is 21±6.86.

Distribution of sample according to their Level of Anxiety describes Majority of patient undergoing hemodialysis (65%) were clinically Significant Anxiety. The mean and SD Anxiety of Patients Undergoing hemodialysis score is 11.11±2.94.

Part IV: Multiple Linear Regression analysis to find the determinants of sociodemographic variables and wellbeing patients with ESRD undergoing hemodialysis.

A significant regression equation was found ($F_{16, 99}=4.5$, $R^2=0.46$, $P=0.000$). Social Support has positively predicted the Psychological Wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis. Depression and Anxiety was the strongest negative predictors of Psychological Wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis.

Discussion

A cross sectional study was conducted to determine the factors influencing wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis. Study conducted at Hanagal Shri Kumareshwar Hospital and Research Centre, Bagalkot and District Government Hospital, Bagalkot. The sociodemographic data and determinants were assessed by using a structured close ended questionnaire prepared by researcher. The percentage wise distribution of sample according to their age describes that most of the patient with ESRD undergoing hemodialysis (37%) were from age group 30 - 40 and 41 to 50 years. (66%) were males. Findings of present study is supported with the study conducted by Anees M, Malik MR, Abbasi T, Nasir Z, Hussain Y, Ibrahim M. The majority of the ESRD patients were 89 (71.2%) males[10]. Findings of the present study are consistent and supported with the study conducted by Taheri-Kharameh, Zahra & Zamanian, Hadi & Montazeri, Ali & Asgarian, Azadeh & Esbiri, Roya. (2016). The majority of the ESRD patients were male (61%)[11]. (74%) of them belonging to Hindu religion. (81%) of them were married. Findings of present study is supported with the study conducted by Hassan, Ragaa, Mohamed, Hanan, Rahman, Asmaa, Ewees, Arzak . The most of 75% of the studied patients were married[12]. Area of residence reveals that majority of the patient undergoing hemodialysis (64%) were from rural area. Findings of the present study are inconsistent and not supported with the study conducted by Bapat U, Nayak SG, Kedleya PG; Gokulnath. The majority of patients were 64% from urban area[13]. (39%) of were educated Up to 10 standard, (32%) of them were House wife, Findings of the present study are in consistent with the study conducted by Bapat U, Nayak SG, Kedleya PG; Gokulnath. The majority of the patients (34%) were employed[13]. (72%) were belonging to Joint family, The results of the present study are in contradictory with the study conducted by Bapat U, Nayak SG, Kedleya PG: Gokulnath. The majority of the patients (60%) lived in nuclear families[13]. (65%) were having income of below 10000, Findings of the present study are consistent and supported with the study conducted by Goyal, Ekram, Chaudhury, Suprakash, Saldanha, Daniel. (67.4%) were having a monthly income between Rs. 5000 and 10,000[14]. (59%) were in their first to second year of life, (85%) were having average social support, (59%) were having the frequency of biweekly dialysis, (52%) were do not have any other disease and (67%) were having average self-care ability. Distribution of sample according to their psychological wellbeing describes that Majority of patients undergoing haemodialysis have Moderate Psychological wellbeing (51%). The results of the present study are inconsistent with the study conducted by Bahadır-Yılmaz, E., Şahin, M , Yüksel. Majority of patients undergoing hemodialysis 39% of them were have good Psychological wellbeing[15]. The mean, SD, Maximum score and Minimum score of psychological wellbeing of Patients Undergoing hemodialysis. is 96, Minimum score is 54. The Total Psychological wellbeing mean and SD Depression of Patients Undergoing hemodialysis score is 82.63 ± 9.9. The results of the present study are in contradictory with the study conducted by McKeaveney C, Noble H, Carswell C, Johnston W, Reid J. The Total Psychological wellbeing mean and SD of Patients Undergoing hemodialysis score is 64.72 ± 19.17 indicating poorer well-being[16]. Distribution of sample according to their Level of Depression describes that Majority of patient undergoing hemodialysis (81%) were clinically significant depressed. The mean and SD Depression of Patients Undergoing hemodialysis score is

21±6.86. The results of the present study are consistent and supported with the study conducted by Cukor D, Peterson RA, Cohen SD, Kimmel PL on depression in end- stage renal disease hemodialysis patients. The majority of the patients undergoing hemodialysis (73.2%) were moderately depressed[17]. The results of the present study are in contradictory with the study conducted by Haddadi, Samira, Alzakerini, Saied, Tajbakhsh, Ramin. The mean and SD Depression of Patients Undergoing hemodialysis score is 44.22±8.0957[18]. Distribution of sample according to their Level of Anxiety describes Majority of patient undergoing hemodialysis (65%) were clinically Significant AnxietyThe results of the present study are in contradictory with the study conducted by Semaan V, Noureddine S, Farhood L on Prevalence of anxiety in end-stage renal disease. Majority of patient undergoing hemodialysis (40.8%) were moderate Anxiety[19]. The mean and SD Anxiety of Patients Undergoing hemodialysis score is 11.11±2.94. The results of the present study are in contradictory with the study conducted by Ye, W., Wang, L., Wang, Y. et al. The mean and SD Anxiety of Patients Undergoing hemodialysis score is 9.361 ± 9.932[20]. The results of the present study are in contradictory with the study conducted by Gündoğmuş, Ayşe, Oguz, Ebru , Cimen, Sanem . The HADS anxiety subscale score was significantly lower in the KT group than in the HD group as their mean and SD Anxiety of Patients Undergoing hemodialysis score is [9.36 ± 4.38 vs 6.89 ± 4.06][21]. A significant regression equation was found (F16, 99=4.5, R^2=0.46, P=0.000). Social Support has positively predicted the Psychological Wellbeing of patients with End Stage Renal Disease (ESRD) undergoing   hemodialysis. Depression and Anxiety was the strongest negative predictors of Psychological Wellbeing of patients with End Stage Renal Disease (ESRD) undergoing hemodialysis.

Limitations of the Study

The present study is preliminary study to assess the factors affecting the wellbeing of patients with ESRD undergoing hemodialysis. Other socio-demographic and clinical factors have been included to find out association between depression, anxiety and Ryff's scale among patients with ESRD undergoing hemodialysis. Some of the psychosocial problems like work environment and social status could have been include to find out factors affecting wellbeing of patients.

Conclusion and Recommendation

The results obtained from the study reflects patients undergoing hemodialysis have moderate psychological wellbeing (51%), and (49%) had good psychological wellbeing. (81%) were significant clinically depressed, and remaining (19) % were mild or no significant depression. patients (65%) were significant anxiety and (35%) mild and No clinically Significant anxiety. Factors affecting wellbeing of patients with ESRD undergoing hemodialysis was assessed by multiple regression analysis and there was a significant regression equation ($F_{1,699}$=4.5, R^2= 0.46, P=0.000). A significant association of psychological wellbeing. among patients with ESRD undergoing hemodialysis with their selected socio demographic variables shows that there was a significant association found between Educational Status [7-8.063, P< 0.036], Occupational Status [x-9.802, P<0.043] and family monthly income [7-5.957, P<0.037]. The study recommends that the intervention can be provided to improve the Psychosocial and wellbeing among patients with ESRD undergoing hemodialysis. As the psychosocial factors improves the wellbeing strategies can be implemented to inculcate the wellbeing of patients with ESRD undergoing hemodialysis that in turns improves wellbeing among patients with ESRD undergoing hemodialysis.

Acknowledgement

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