International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Socioeconomic Burden of Hemodialysis on Patients undergoing Dialysis at BPKIHS, Nepal

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Abstract: ***The most common cause of Chronic Kidney Disease (CKD) is diabetes and hypertension. Hemodialysis is a treatment option available for patients experiencing renal insufficiency and is an expensive endeavor. To find out socioeconomic burden of hemodialysis on patients undergoing dialysis and to find out association between the socioeconomic burden of patients with selected variables. Descriptive cross-sectional study was conducted in hemodialysis ward of BPKIHS. All 50 patients who were on current dialysis schedule and met inclusion criteria were included in the study. Sample was collected by using purposive sampling technique. A pre tested semi structured questionnaire was used to collect the data. Data were analyzed using descriptive and inferential statistics. The total cost per session was found to be around 5000 NPR. Regarding the cost of treatment, direct medical cost contributes for 78.9% whereas indirect medical cost contributes 21.1%. Nearly three-forth (74.0%) of patients reported feeling of financially dependence . Forty percentages of respondents sold their belongings like animals/lands /jewelry to manage dialysis cost. Most (90.9%) of the respondents became unemployed because of job loss . Around two third (62.0%) of respondents had felt isolated in their family. Due to which the patients suffer from socioeconomic burden despite of Government support.***

Keywords: Chronic Kidney Disease, Patient, Hemodialysis, Socioeconomic burden

1. Introduction

Chronic Kidney disease (CKD) is defined as kidney damage or glomerular filtration rate (GFR) <60.0ml/min/ 1.73 m2 for three months or more irrespective of the cause.[1] The most common cause of kidney disease is diabetes and hypertension.[2] There is five stage of chronic kidney disease among those final stage of kidney disease is called End stage of kidney disease (ESRD). CKD 5/ESRD is defined when GFR is <15.0ml/min/1.73m2.[1] At this stage, the kidneys are no longer able to remove enough wastes and excess fluids from the body. As a result symptoms of uremia occur but are not limited to, nausea, vomiting, loss of appetite, weight loss and ultimately changes in mental status, confusion, reduced awareness, psychosis, seizures, agitation, and coma.[3] Progression of the disease is measured through several tests such as the Glomerular filtration rate, urine protein tests, and blood pressure. As of today, there is no cure for end stage renal disease. Patients with stage 5 renal CKD require either a kidney transplantation or dialysis for continued survival. This condition will lead to death in a matter of days or weeks depending on existing renal function as each kidney deteriorates.[4] Hemodialysis is a treatment option available for patients experiencing renal insufficiency, in which a machine is used to act out the function of the kidney such as filtering the blood and excretion of by-products. Most of these patients choose to be placed on hemodialysis which can be debilitating and can threaten body image, finances, relationships and independency. Before dialysis was available, patients with renal disease faced imminent death. However, since the development of treatment modalities such as dialysis and renal transplant, the life of renal patients have been improved and prolonged, as opposed of this, they have to pay the high cost of weekly treatments for dialysis and occasional admission to the emergency department due to complications.[5] CKD has become one of the most expensive diseases to treat in present times. This is particularly true in the developing world where the resources are limited. It has become a global threat with significant morbidity and mortality.[6] According to the 2010 Global Burden of Disease study CKD is the 18th leading causes of death with annual death rate 16.3 per 100,000 worldwide where as it is the 8th leading cause of death in the United States.[7,8] The average incidence of chronic kidney disease Stage 5 (CKD5) in developing countries is 150 per million populations.[10] In India; An Indian population-based study determined the crude and age-adjusted ESRD incidence rates at 151 and 232 per million populations, respectively.[9] It is estimated that 10% or 2.6 million Nepali people suffer from kidney disease. Kidney disease is increasing in Nepal by more than 10,000 people per year.[11] The global average prevalence for dialysis was 215 patients per million populations, although significant regional variations existed. In the United States, there were 101,688 incident HD (Haemo dialysis) patients in 2007.[10] It is estimated that there are about 55,000 patients on dialysis in India, and the dialysis population is growing at the rate of 10–20% annually. The prevalence of patients on dialysis in China was 51.7 in 2008 and 92.3 in 2009.[12] The growth rate of the dialysis population in China is estimated at 20 –30% per year. In Nepal, prevalence of dialysis patient was not found, may be due to lack of registration. In BPKIHS(BP Koirala Institute of Health Sciences) , from 16thJuly 2012 to 15th June 2013, total admitted cases diagnosed with CKD were about 166, total hemodialysis cases were about 840, total hemodialysis session were 3,292.[13] Chronic Kidney Disease is a major public health problem worldwide with enormous cost burdens on health care systems in developing countries. This enormous cost of treatment leads to a large burden on health care systems, particularly in developing countries like Sri Lanka and based on observation like Nepal.[14] In fact CKD patients are increasing in number day by day.[1] First artificial kidneys developed in Netherlands in 1943 AD. First successful treatment of CKD was reported in 1960 AD. Life saving treatment begins for CKD in 1972 AD.[14] Nephrology service in Nepal was started by an eminent

nephrologists of Nepal late Dr. P. R. Satyal in early 1970s, but hemodialysis (HD) service in Nepal was started only in 1987 in Bir Hospital (National Academy for Medical Sciences). In Nepal Medical College Teaching Hospital (NMCTH), HD service is available since 2005.[1] In BPKIHS peritoneal dialysis (PD) started in Jan.1998 and HD started in August 2002.[14] Majority of population of Nepal are farmer and is not conscious about health due to lack of education. Most of the population is in low economic status.[17] As average income for a Nepali is 26,000 NPR per year and dialysis requires the patient to undergo treatment 2-3 times per week for four hour for the rest of their life.[11] The average cost of each session of HD varies between 1,500-3,000 NPR in Nepal[18] and dialysis costs in Nepal is in an average 20,000 NPR per month, if there is no complication and the transplantation cost in Nepal is NPR 8-10 Lakhs[11] and in BPKIHS, the expenditure of eachsession of HD is about 2,000-5,000NPR that can rise in case of complication which make dialysis an impossible choice for most of Nepalese people.[11] If transplantation is done in India, the costs can be 2-3 times higher. Many people sell their possessions and property to pay for treatment of kidney disease and they are left with nothing.[11] The government contributes to the expenses by providing 1 lakh NPR once for dialysis patients especially those are under the underprivileged.[20] Due to huge expenditure and lack of government support results in decrease or non-compliance of patients to hemodialysis treatment. Few studies have conducted regarding the topic. Hence the present study was designed to assess the socioeconomic burden and its associated factors.

2. Literature Review

CRF has become one of the most expensive diseases to treat in present times. This is particularly true in the developing world where the resources are limited. It has become a global threat with significant morbidity and mortality.[6]

Chronic Kidney Disease is a major public health problem worldwide with enormous cost burdens on health care systems in developing countries. This enormous cost of treatment leads to a large burden on health care systems, particularly in developing countries like Sri Lanka and based on observation like Nepal.[14]In fact CKD patients are increasing in number day by day.[1]

Hemodialysis is a treatment option available for patients experiencing renal insufficiency, in which a machine is used to act out the function of the kidney such as filtering the blood and excretion of by-products. HD is performed to remove toxic wastes from the blood of patients in renal failure. [21]

Most of these patients choose to be placed on Hemodialysis which can be debilitating and can threaten body image, finances, relationships and independency. Before dialysis was available, patients with renal disease faced imminent death. However, since the development of treatment modalities such as dialysis and renal transplant, the life of renal patients have been improved and prolonged, as opposed of this, they have to pay the high cost of weekly treatments for dialysis and occasional admission to the emergency department due to complications.[5]

A study conducted in USA (United States of America) case reveals that the worldwide incidence of kidney failure is on the rise and treatment is costly. Kidney failure patients require either a kidney transplant or dialysis to maintain life and the United States; there were 101,688 incident HD patients and 6,506 incident PD(peritoneal dialysis) patients in 2007. Due to the fact that the worldwide incidence of kidney failure continues to rise placing USA in the second position right after Taiwan, the accumulated experience from USA could be used as a characteristic prototype for the analysis of the economics related with modality choices and their influence in the quality of life and life expectancy of end stage renal disease (ESRD) patients. In USA the prevalent dialysis population grew 30% between 2000 and 2007, reaching nearly 370,000. The annual rate of growth has slowed in the prevalent hemodialysis population, from 8.7% in 1997 to 3.8% in 2007.[10]

The global average prevalence for dialysis was 215 patients per million populations, although significant regional variations existed.[9] In theUnited States, there were 101,688 incident HD patients in 2007.[10]It is estimated that there are about 55,000 patients on dialysis in India, and the dialysis population is growing at the rate of 10–20% annually.[9] The prevalence of patients on dialysis in China was 51.7 in 2008 and 92.3 in 2009. The rate of growth of thedialysis population in China is estimated at 20 –30% per year.[12] In Nepal, prevalence of dialysis patient was not found. In BPKIHS, from 16thJuly 2012 to 15th June 2013, total admitted cases diagnosed with CKD were about 166, total hemodialysis cases were about 840, total hemodialysis session were 3,292.[13]

Cross sectional community based study by Aggrawal where family monthly income was calculated by dividing the total in all sources in rupees. Twenty eight (1.3%) of the families were having monthly per capita income more than Rs.(Rupees) 50,000, 3.2% between Rs. 20,000 to Rs. 49,999, 7.4% from Rs. 10,000- 19,999, 1.4% between Rs. 5,000, Rs. 9,999, 16.0% between Rs. 2,500-Rs. 4,999, 24.4% from Rs. 1,000 - Rs. 2,499 and 36.2% were having monthly per capita income less than Rs. 1,000/-. The mean score obtained was 2.44. It was found that 31 families (1.5%) belonged to Upper high SES, 221 (10.5%) to High, 291 (14.2%) to Upper middle, 507 (24.2%) to Lower Middle, 745 (35.6%) to Poor and 294 (14.0%) belonged to Very Poor socioeconomic category.[24]

A study conducted in India shows that as per the December 2007 index declared by Rajya Sabha, the per capita income in India is Rs 20734 per annum. The total population is 113 corer of which 26% live below the poverty line where the daily earning is Rs 10, in comparison, the international standard below the poverty line is US $1 per day i.e. Rs 45 per day. By this parameter, in India, 70% of the population would be below the poverty line. The government spends barely US $8 per capita on health with priorities more on infectious disease, sanitation, nutrition etc.[31]

The average cost of each session of HD varies between 1,500-3,000 NPR in Nepal [18] and monthly dialysis costs in Nepal is about 20,000 NPR per month, if there is no

complication and the transplantation cost in Nepal is NPR 8-10 lakhs.[11]

The government will provide refunds if the private hospital has signed an agreement with the government. The ministry has also decided to provide 2,500 NPR to the medical centres for each dialysis session upto 104 times. So far, a dozen private hospitals have signed agreements with the government. Expenditure provided by Nepal Government for dialysis was 100,000 NPR once in their lifetime but now it has extended from 100,000 to 2, 60,000 NPR from date of 8/8/2013.[32]

A study shows that there were enrolled 78 patients on regular hemodialysis for at least 2 years and 33 kidney transplant patients on regular follow-up at Gezira Hospital for Renal Diseases and Surgery in Sudan. The annual cost of hemodialysis was found to be US $ 6,847.00. The total cost of the first year after transplantation was US $ 14 825.04 and the cost of kidney transplantation after the first year was US $ 10, 651.00. The total hospitalization days and absence from work were less in the transplant group.[37]

A study conducted by Muhamad shows that the cost of the money spent on the therapy, majority of the patients 63% males and 46% females spend between 21,000 30,000 naira in a week. Some of the patient this can be very serious given the income whereby barely a quarter of the males earned more than 50,000 naira in a month and none of the females were found to earned that much. In a case where a patient has been on treatment for long and fall short of funds, the social welfare of Aminu Kano teaching hospital sometimes come to the rescue of such patients by paying their medical bills. Thus as a result of the cost implication involved in the therapy, patients for most part cannot afford to pay for the sessions alone except with the assistance of relatives and others whereby majority of the women (80%) got their funds through their family while a little below half (48%) of the male patients got through the same source i.e. family This is in contrast to what obtained in the industrial world where treatment is readily available and is covered by government or private health.[30]

A study conducted by Jha shows that the monthly cost of the common dialysis prescriptions: 2 HD sessions/week and 3 peritoneal dialysis (PD) exchanges/ day was estimate d at Rs. 2985 2 (US$ 609) and 28, 7 63 (US$ 585), respectively. Patients often cut down on dialysis frequency for economic reasons. Frequent and often long-term hospitalizations add to the financial burden.[12]

Medical costs are self-funded by a majority of patients, and such catastrophic expenses further push families deep into poverty.[9] Hemodialysis for ESRD is an expensive endeavor. No government can cope with the ever increasing number of patients with ESRD.[16]

A study conducted by Chetri which shows hypotension was frequently observed complication in these patients (45.0%) followed by HTN (25.0%).Anaemia was corrected by blood transfusion in about 75.0% of patients and by erythropoietin and intravenous iron sucrose in about 25.0%. Majority (58.0%) of patients were unable to carry out their day to day activities**.** Approximately 2,000 NPR (US $.25) was the cost of hemodialysis per session. Average monthly income of study population was 16312.5 NPR (US$.204).[27]

3. Methodology

Descriptive Cross-sectional study design was used for the study. The study was conducted in the Dialysis Unit of BPKIHS, Dhahran. All patients who were undergoing hemodialysis for at least 3 months at BPKIHS, Dharan were the population of the study. Patients undergoing hemodialysis at BPKIHS, Dharan for at least 3 months were the sample of the study. Sample size (n) was 50 patients. Patients, who were attending for hemodialysis at BPKIHS during data collection period (22nd December 2013 to 18th January 2014) and met the inclusion criteria, were enrolled in the study. In BPKIHS, based on previous record, 16th July 2012 to 15th June 2013, total hemodialysis cases (old and new) were about 840 and total numbers of patients coming for hemodialysis in a month were around 70; among whom whosoever were eligible became the sample of the study. Purposive sampling technique was used to collect the sample. The comprehensive literature search and review were done extensively to construct the research instrument. The instrument was then distributed among six experts. The logical sequence of questionnaire was maintained and validity of the tool was ascertained from those experts. Three nursing faculties from the Department of Medical Surgical Nursing, one doctor from the Department of Internal Medicine, and two biostatistician from the School of Public Health and Community Medicine. Based on, their suggestions, necessary modifications were made. Research tool was translated into Nepali and checked by subject expert. Pre-testing of tools was done in 10% of total sample size before the data collection in the similar setting. Those who were participated in pre-testing were not included in the sample. Permission from Institutional Ethical Review Board, Nursing Administrator, and Hemodialysis Unit In charge of BPKIHS was obtained to conduct the study. Informed written consent was obtained from each participant. A semi-structured questionnaire for data collection was developed. Data was collected using a semi-structured interview questionnaire based on the objectives of the research. The patients were interviewed purposively while they came to take dialysis. Patients who were attending for hemodialysis at BPKIHS during data collection period and had got at least 3 months of hemodialysis were interviewed. Privacy and confidentiality of the subjects were maintained and the obtained data was used for the research purpose only. Data was collected by the direct interview method. Data was collected by using a semi-structured questionnaire. After collection of data, coding was done. Coded data was entered into Excel Version 2007 and transformed in SPSS 10 version. Descriptive statistics was used to describe the socio-demographic and other related variables. Chi- Square test, Fisher's Exact and Yates Corrected Chi-Square test were used to find out association between selected demographic variables and feeling of financially dependence of respondents. Whereas Wilcoxon Signed Ranks test was used to find out difference between socioeconomic status before and after hemodialysis. Kruskal Wallis test was used to find out association between vascular access of hemodialysis and direct cost as well as distance and means of transportation.

Independent Student's' test was used to find out association between frequency of hemodialysis and direct cost. Spearman's Rank Correlation Coefficient was used to find out the correlation between indirect cost and distance from home to hospital.

4. Results

Table 1: Socio–demographic Characteristics of Respondents, N=50

Characteristics	Categories	Frequency	Percentage
Age (in completed years)	20-29	4	8
	30-39	12	24
	40-49	13	26
	50-59	9	18
	60-69	10	20
	70-79	2	4
	(Mean ± SD) = (46.5±13.4), Range = (20 -71)		
Age at diagnosis of CKD (in completed years)	20-29	6	12
	30-39	13	26
	40-49	13	26
	50-59	10	20
	60-69	6	12
	70-79	2	4
	(Mean ±SD) = (44.79±13.37), Range = (20 -70)		
Age at first dialysis (in completed years)	20-29	4	8
	30-39	12	24
	40-49	13	26
	50-59	11	22
	60-69	8	16
	70-79	2	4
	(Mean ±SD) = (46±13.19), Range = (20-71)		
Sex	Male	38	76
	Female	12	24
Marital Status	Married	39	78
	Unmarried	6	12
	Widow/Widower/Divorced	5	10
Address (in District)	Sunsari	16	32
	Morang	14	28
	Jhapa	7	14
	Siraha	3	6
	Bhojpur	3	6
	Others	7	14
Locality	Rural	26	52
	Urban	24	48

Table 2: Occupational and Family Status of the Respondent, N=50

Characteristics	Categories	Frequency	Percentage
Occupational Status	Business	6	12
	Service	4	8
	Agriculture	14	28
	Labour	4	8
	Student	3	6
	Retired/pensioners	3	6
	Housewife	5	10
	Overseas labour	5	10
	Others	6	12
Family Income (monthly in NPR)	Less than 20000	16	32
	20000 to35000	18	36
	35000 to 50000	5	10
	50000 to 65000	5	10
	More than 65000	6	12
	(Mean±SD) = (38467±34109), Range= (5000-190000)		
Respondent as Head of family	Yes	29	58
	No	21	42
Types of family	Nuclear	27	54
	Joint	23	46
Size of the family	≤ 4 members	15	30
	>4 members	35	70
	(Mean± SD) = (6.34±3.07), Range = (2 -15), Median= 5		

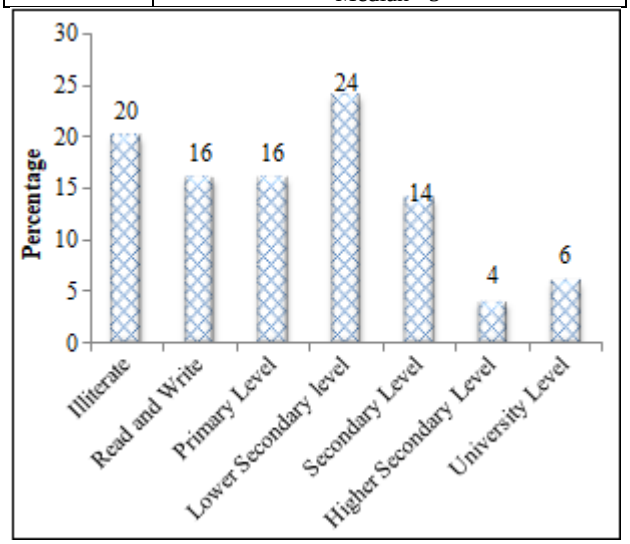

Figure 2: Educational Status of the Respondents (N = 50)

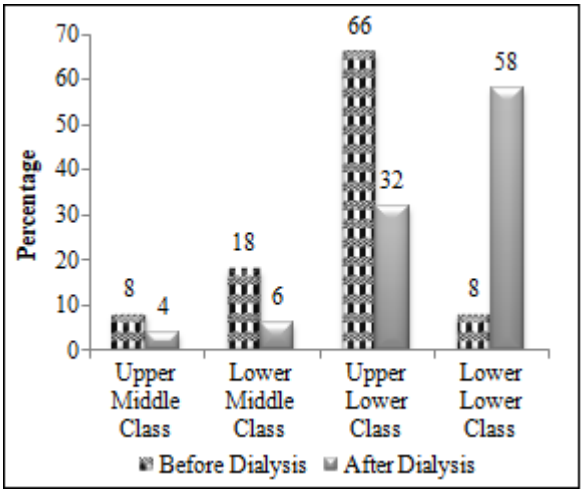

Figure 3: Socioeconomic Status before and after Dialysis (n=50)

Table 3: Information Related to Co – morbid Condition and Chronic Disease, N=50

Characteristics	Categories	Frequency	Percentage
Co-morbid condition of respondents* (n=50)	HTN	41	82
	Anemia	20	40
	DM	15	30
	Ch. Glomerulonephritis	12	24
	IGA nephropathy	2	4
	DCM	1	2
	Gastritis	1	2
	Polycystic Kidney Disease	1	2
	Hyperthyroidism	1	2
Suffering from chronic disease in family*(n=25)	Hypertension	22	88
	Diabetes	6	24
	Heart disease	6	24
	Cancer	2	8
	Acid peptic disease	2	8
	Hyperthyroidism	1	4

*Multiple Responses

Table 4: Information Related to Renal failure and Renal Replacement Therapy, N=50

Characteristics	Category	Frequency	Percentage
Duration of renal failure (in years)	< 2	38	76
	2 to 4	6	12
	4 to 6	5	10
	> 6	1	2
	(Mean±SD) = (16.6 ± 18.8) in month, Range = (3-84) in month, Median=11 (in month)		
Duration of Hemodialysis (in month)	3 to 6	25	50
	6 to 9	6	12
	9 to 12	11	22
	12 to 15	2	4
	> 15	6	12
	(Mean±SD) = (8.9 ± 6.3), Range= (3-24), Median=6 month		
Frequency of hemodialysis	Once Per week	17	34
	Twice Per week	17	34
	Once Per 10 -15 days	15	30
	Once Per month	1	2
	(Mean ±SD) = (4.8 ± 2.4), Range=(1-8) session, Median=4 (in a month)		
Vascular access for HD	AV Fistula	38	76
	Femoral venous catheter	9	18
	Central venous catheter	3	6
First vascular access for HD	Femoral venous catheter	39	78
Future Plan of hemodialysis	Lifelong	33	66
	Till transplant	11	22
	Not decided	6	12
Reason for unable to undergo renal transplant* (n= 33)	Age	11	33.3
	Lack of money	16	48.5
	Not getting donor	7	21.1
	Blood sugar uncontrolled	2	6.1

*Multiple Responses

Table 5: Means and Time Needed to Reach Hospital, N=50

Characteristics	Categories	Frequency	Percentage
Residence of the Respondent	Own home	44	88
	Relative's home	3	6
	Home taken for rent	3	6
Migration for Dialysis	Yes	6	12
	No	44	88
Time taken to reach hospital	Less than 1 hour	15	30
	1-2 hour	19	38
	More than 2 hour	16	32
Distance from BPKIHS	Less than 50 Km	29	58
	50 to 100 Km	14	28
	100 to 150 Km	4	8
	More than 150 Km	3	6
	(Mean ±SD)= (57.6 ± 58.2), Range =(2-275) , Median = 47.5		
Usual means of transportation	Ambulance	3	6
	Own vehicle	5	10
	Public bus/ Tempo	36	72
	Van/taxi	6	12
Fooding expenses	Always	37	74
	Sometimes	2	4
Lodging expenses	Always	12	24
	Sometimes	4	8

Table 6: Monthly Expenditure Details (in NPR), N=50

Characteristics	Categories (in NPR)	Frequency	Percentage
Indirect Cost: Transport cost, fooding cost and lodging cost	Less than 3000	22	44
	3000 to 6000	16	32
	6000 to 9000	5	10
	9000 to 12000	3	6
	12000 to 15000	4	8
	Total	50	100
	(Mean± SD) = (4694.0 ±3940.8), Range= (120-15000), Median=3700, IQR= (1975 -6100)		
Direct cost: Investigation, drugs and devices, dialysis charges, erythropoietin costand blood transfusion cost	Less than 15000	25	50
	15000 to 20000	8	16
	20000 to 25000	4	8
	25000 to 30000	9	18
	30000 to 35000	4	8
	Total	50	100
Total Direct Cost	(Mean±SD) = (17509.0±7715.3), Range= (7520-33670)		
Direct cost per session	Mean±SD= (3930.1 ± 1089.1), Range = (2408-7685)		
Total Cost (Both Direct and Indirect Cost)	Less than 10000	4	8
	10000 to 20000	22	44
	20000 to 30000	12	24
	30000 to 40000	9	18
	40000 to 50000	3	6
	Total	50	100
Total cost	(Mean ± SD) = (22285.4±9877.0), Range= (8720-47242)		
Total cost per session	Mean ± SD = (4935.0±1235.0), Range= (3000-8935)		

Table 7: Source of Funds for Managing Dialysis Cost, N= 50

Characteristics	Categories	Frequency	Percentage
Source of Funds for Managing Dialysis Cost*	Government support	50	100
	Family member	16	32
	Loan(Bank)	10	20
	Relatives	14	28
	Neighbors	14	28
	Friends	1	2
	GO/CBO	7	14

*Multiple Responses

Table 8: Problems in Continuation of Dialysis, N=44

Characteristics	Category	Frequency	Percentage
Problems faced by respondents to give continuation in dialysis*	Travel	24	54.2
	Lack of blood	13	29.9
	Lack of care giver	12	27.6
	Physical weakness	4	9.2
	Delay turn for dialysis	2	4.6
	Rent not getting	1	2.3

*Multiple Responses

Table 9: Complications/Symptoms Experienced by Respondents during and after Dialysis

Characteristics	Categories	Frequency	Percentage
Complications/ symptoms experienced by respondents during dialysis* (n = 45)	Chills and rigor	41	91.1
	Vomiting	18	40.0
	Hypotension	17	37.8
	Fever	17	37.8
	Cramps	15	33.3
	Dizziness and sweating	9	20.0
	Hypertension	8	17.8
	Epigastria pain	8	17.8
	BT allergic reaction/Itching	7	15.6

	Dyspnea	5	11.1
	Headache	4	8.9
	Backache	3	6.7
	Shock	2	4.4
	Others	3	6.6
Complications/ symptoms experienced by patients after dialysis* (n=25)	Vomiting	9	36.0
	Dyspnea	8	32.0
	Diziness and sweating	6	24.0
	Loss of appetite	4	16.0
	Fever	3	12.0
	Chills	2	8.0
	Epigastric pain	2	8.0
	Shock	2	8.0
	Backache	2	8.0
	Leg cramps	1	4.0
	Headache	1	4.0
	Hypertension	1	4.0
	Diarrhoea	1	4.0

*Multiple Responses

Table 10: Psycho -social Burden of Hemodialysis n=50

Characteristics	Rarely No. (%)	Sometimes No. (%)	Occasionally No. (%)	Always No. (%)
Feeling of economic dependence	0(0.0)	18(36)	(0.0)	19(38)
Discussion of problems with their family members	1(2)	21(42)	(0.0)	21(42)
Social contact with relatives, friends, cousins	0(0.0)	20(40)	0(0.0)	14(28)
Source of helping economical support like political/ social/ official	0(0.0)	3(6)	1(2)	3(6)
Feeling of difficult in meeting economic demand of illness	0(0.0)	18(36)	0(0.0)	19(38)
Feeling of economic argument among family members	0(0.0)	13(26)	0(0.0)	0(0.0)

Table 11: Irregularity/Loss of Family Member's Job and Education

Characteristics	Category	Frequency	Percentage
Family members who are irregular in attending their Job/lost their job(n=6)	Son	4	8.0
	Brother	1	2.0
	Mother	1	2.0
Family members who are irregular ingetting their education* (n= 24)	Son	13	54.2
	Daughter	9	37.5
	Brother	2	8.3
	Sister	2	8.3
	Grandson	1	4.2

*Multiple Responses

Table 12: Impact of Hemodialysis on Patient's Life, N=50

Characteristics	Frequency	Percentages
Discontinued education (n= 3)	3	100
Job lost (n=33)	30	90.9
Skipped regular schedule of HD	12	24
Sold their belongings	20	40

Table 13: Association of Socio-demographic Variables with Feeling of Dependence

Characteristics	Feeling of Dependence				P-value
	Yes (n=37)		No (n=13)		
	No.	%	No.	%	
Age of Respondent*					
<50 Yrs	25	86.2	4	13.8	**0.021**
≥ 50 yrs	12	57.1	9	42.9	
Marital Status ***					
Married	28	71.8	11	28.2	0.704
Single	9	81.8	2	18.2	
Educational Status**					
Upto SLC level	34	75.6	11	24.4	**0.046**
Above SLC level	3	60.0	2	40.0	
Occupation ***					
Employed	24	66.7	12	33.3	0.078
Unemployed	13	92.9	1	7.1	
Socio-economic Status**					
Middle Class	1	20.0	4	80.0	**0.013**
Lower Class	36	80.0	9	20.0	
Age of respondent at 1st time Dialysis *					
<50	25	86.2	4	13.8	**0.021**
≥ 50	12	57.1	9	42.9	
Types of Family *					
Nuclear	21	77.8	6	22.2	0.509
Joint	16	69.6	7	30.4	
Head of the Family*					
	19	65.5	10	34.5	0 .108
	18	85.7	3	14.3	
Duration of Dialysis***					
Within 1 Yr	31	73.8	11	26.2	1.00
More than 1 Yr	6	75.0	2	25.0	

Pearson's Chi-Square Test *, Fisher's Exact Test **, Corrected χ^2 Test *** p-value<0.05

Table 14: Difference of Socioeconomic Status Score before and after Hemodialysis
n=50

Characteristics	Total Score	Mean±SD	Mean ranks	Sum ranks	P-value
Socioeconomic status score before	442.0	8.8 ±2.8	20	780	<0.001
Socioeconomic status score after	286.0	5.7 ±3.0	.00	.00	

Wilcoxon Signed –Rank Test, p-value<0.05

5. Discussion

Renal replacement therapy such as hemodialysis is accepted and successful modalities for maintenance of life of patients with the end stage of renal disease. Dialysis is an expensive therapy. A descriptive cross – sectional study was carried out among hemodialysis patients who were attending in BPKIHS to find out socioeconomic burden of hemodialysis among them and to find out the association between socioeconomic burdens of patients with selected variables. In this study, 26.0% of respondents were between 40 to 49 years which is highest among others different age group which is inconsistent to the earlier study done by Odufuwa23 where near half (45.0%) of respondents were between age group 40-49 years. In this present study, mean age of respondents were 46.5 years. Similar result was reported by other studies which were done among hemodialysis patients by Bhatti16 and Manandhar 18 where mean age of respondents were 45.92, 45. 82 years

respectively. In the study, majority of respondents (76.0%) were male which is similar to the earlier studies of Odufuwa23, Bhatti 16 and Abraham 6 where total male were, 65%, 76.67%, and 73% respectively. More than half (52.0%) of respondents were from rural areas since majority of Nepalese are living in rural area. Present study reveals that majority (90.0%) of respondents were upto SLC which is contrast to earlier study done among hemodialysis patient in Nigeria where 40% of respondents were tertiary level.30 In the present study, 28.0% of respondents had occupation Agriculture as in a study of Nigeria, 40.0% of respondents were involved in business.23 The reason may be because Nepal is agricultural country. More than half (58.0%) of the respondents are head of the family, it is supported by a study done in Sargodha where 68.33% of respondents were head of family. Fifty four percentages of the respondents lived in nuclear family but in the study done in Sargodha where majority (65.0%) lived in joint family. More than one fifth (21.1%) of respondents said that they were having a problem to continue dialysis due to lack of caregivers. The present study shows that co-morbid condition where majority (82.0%) of respondents had hypertension (43.6%) which is supported by the earlier study done by Abraham where the highest (45.66%) was hypertension among other co-morbid condition of respondents. The study reveals that majority of respondents (86.0%) had duration of renal failure for less than 3 years, which is in contrast with a study done in India among the hemodialysis patient where minority (5.7%) of the respondents had duration of renal failure less than 3 years. Mean duration of renal failure and duration of hemodialysis in the present study are 1.33 ± 1.57 years and 8.92 ± 6.31months respectively where a study done by Suja showed that mean duration of renal failure and duration of hemodialysis were 4.2 ± 1.6 years and 2.8 ± 1.8 years respectively. The study also showed that all the patients were getting dialysis thrice a week36 whereas in present study, 34.0%, 34.0%, 30.0% and 2.0% of respondents were getting dialysis once a week, twice a week, once per 10-15 days and once a month respectively. Majority (76.0%) of respondents were getting hemodialysis through AV fistula followed by femoral (18.0%) and central venous catheter (6.0%). Three forth (78.0%) of patients started the dialysis with femoral catheter access while only 12.0% had their first dialysis from a pre formed AV-fistula. Majority (66.0%) of respondents were unable to undergo renal transplant because of lack of money. Regarding the family members suffering from chronic disease, half of the respondent's family members (50.0%) had some kind of chronic disease. Out of them majority (88.0 %) had hypertension and diabetes mellitus (24.0%).Majority (88.0%) of respondents were coming for hemodialysis from their own home. In case of usual means of transportation, majority (72.0%) of respondents came through public bus/tempo and only 6.0% of respondents by ambulance. Twelve percentages of respondents had migrated to Dharan to take hemodialysis to BPKIHS because of long distance from their home to BPKIHS.More than half (58.0%) of the respondents came for dialysis in BPKIHS from less than 50 Km whereas a study conducted in the Nigeria, it showed that majority (85.0%) of respondents came from less than <20 Km. All of the respondents were expensing money in transportation. In case of fooding and lodging expenses, three forth (74.0%) of the respondents were always expensing in fooding where as one forth (24.0%) of respondents were always spending money in lodging while they came to take dialysis. Estimated average hemodialysis cost per session in Nepal, Bir hospital, NMCTH (Nepal Medical College and Teaching Hospital), HOTC (Human Organ Transplant Centre), Nursing home and private medical colleges are1,500-3,000NPR, 2,500NPR, 2,000 NPR , 3,000NPR and 3,500 to 5,000NPR respectively.33,34,35 The cost of each HD session in India varies from Rs. 150 IC in government hospital to 2,000 IC in some corporate hospitals.31 The present study shows that average cost of HD per session in BPKIHS is 2,633.69 ± 773.18 NPR which is similar to Nepal, NMCTH, HOTC, Bir hospital. But it is slightly cheaper than nursing home and private hospital. Hemodialysis cost per session in India is slightly cheaper than Nepal. Present study shows HD cost per session including total cost (indirect and direct cost) is 4935 ± 1235 NPR which is similar to earlier study done in India where dialysis cost per session was found to be 4500 IC.36 Present study also shows that direct medical cost contributes for 78.9% whereas indirect medical cost contributes 21.1%. A similar study done in India where direct medical cost was contributed 56.0% and non-direct medical cost was contributed 20.0%.In the total indirect cost, the respondents who were always expensing money in fooding and in lodging were only included. Because the respondents who were sometimes. Expensing in fooding and in lodging, the amount of cost was not spent every month and amount was also in small. Hemodialysis cost per month in an average in Nepal, HOTC, Nursing home and private medical college are 20,000 NPR, 10,000 NPR and 24,000 NPR respectively.33,34, 35 In the present study, mean HD cost is 11728.48 ± 5075.70 NPR. It is slightly more than HOTC where as less than Nepal, Nursing home and private medical college. This difference is probably due to reuse of dialyzer and less frequency of hemodialysis per month in BPKIHS because of inadequate number of dialysis machine. Average hemodialysis cost per month (total direct and indirect cost) as shown by present study is 22, 285.38 ± 9876.96 NPR. Because of such above high cost, the present study shows that socioeconomic status of respondents before and after hemodialysis was significantly different. The socioeconomic status of the respondent was calculated according to modified Kuppuswamy's scale based on their educational qualification, occupation, and monthly income. In similar study done in India, it was found that 60.0% of respondents belonged to middle class whereas in the present study, three forth (74.0%) belonged to lower class.Muhamud30 showed that only 6.94% of respondents had got government support. Present study shows that none of the respondents were managing their dialysis cost only with their own money. All of the respondents had got from Nepal government for managing their dialysis cost. However that was not enough. Besides government support and family support, they were also seeking and getting support from other sources like neighbors (28.0%), Bank loan (20.0%), relatives (28.0%), GO/CBO (14.0%) and friends (2.0%). It proves that support provided by government is not sufficient in order to manage dialysis cost throughout life. Thus the additional supports from the government are demanded. Majority (88.0%) of respondents were facing problem of travel (54.5%) followed by blood scarcity (29.5%) and lack of care giver (27.3%). As more than half (52.0%) of respondents were from rural area

where there is lack of transportation facilities. During dialysis, majority (91.1%) of respondents had chills and rigor followed by vomiting (40.0%) and hypotension (37.8%) which is in contrast to an earlier study conducted by Odufuwa23 where all of respondents had vomiting, dizziness and oliguria. After dialysis, 36.0% of respondents had vomiting followed by dyspnea (32.0%), dizziness and sweating (24.0%) which is different from earlier study of Odufuwa 23 where majority (80.0%) of respondents had dizziness and oliguria followed by vomiting (70.0%) and nausea (60.0%).Three forth (74.0%) of respondents had feeling of financial dependence and respondents among those, majority (86.2%) were from age group below 50 yrs. People of this age group are usually responsible for earning money and caring others like elderly and children. Almost all (86.0%) of respondents discussed their problems with their family. More than half (68.0%) of respondents had social contact with their relatives, friends, cousins. It indicates that Nepalese love and care the sick person. Majority (74.0%) of respondents felt difficulty in meeting financial demand of illness. Because majority of respondents (58.0%) were head of family and after getting illness they had to leave their job.About one forth (24.0%) of the respondents were noncompliant to frequency of dialysis. The study defined noncompliance as skipping one or more HD sessions during their hemodialysis period because of money. It is similar with a study done in India where 24.4% of respondents were skipping dialysis within one month.40 Forty percentages of respondents had sold their animals/land/jewelry to manage the dialysis cost. It is nearly similar to study done in India where 30.0% of respondents had sold their property and jewellerry.31 Almost all (96.0%) of respondent's work and duties around their house were interfered because of their illness. The quality of life deteriorated with the duration of dialysis and underlying pathology leading to ESRD.15 Seventy four percentage of respondents enjoyed going out with the people, but 21.6 % of respondents were not going out with the people because of their physical problems. About three forth (72.0%) of the respondents had good relationship with their spouse. Majority (84.0%) of respondents were involving in their family decision making which is similar to earlier study done in Sargodha where also majority (80.0%) of respondents were involving in their family decision making.

Near half (48%) of the respondent's family members were attending their education irregularly because they had to accompany with patients for HD. Family members who were irregular in getting their education were son (54.2%), daughter (37.5%), brother (8.3%), sister (8.3%) and grandson (4.2%). Majority (62.0%) of respondents were feeling isolated in their family which as compared to a study done in Sargodha where it was found to be lower (41.67%).16 It is probably due to the fact that the respondents become emotionally labile, and have more free time as they leave their normal routine thus having a feeling of isolation. This findings also supported by a study conducted by Bhatti.The present study shows that respondents age groups below 50 years had higher (86.2%) feeling of dependence than respondents age groups above 50 years or equal to 50 years, it was found statistically significant (p=0.021). Respondents who lived single, had more (81.1%) feeling of dependence than married but it was not statistically significant (p=0.704). Whereas while analyzing the association between educational status and feeling of dependence, it was statistical significant (p=0.046). Regarding relationship between occupational status and feeling of dependence, even though unemployed had high level (0.078) of feeling of dependence but it was not significant. (p=0.078). An employed respondents were those who were in productive job or in retired.Respondent belonged to lower class had higher (80.0%) feelings of dependence compared to middle class. It was statistically significant (p= 0.013). Respondents while they got hemodialysis below 50 years of age had higher (86.2 %) feelings of dependence than respondents who got dialysis after age of 50 years. it was statistically significant (p= 0.021). Even though nuclear family had higher (77.8%) feeling of dependence than joint family. It was not statistically significant (p= 0.509). Respondents, who were not head of family, had more (85.7%) feeling of dependence than who were. But Feeling of dependence were not statistically significant (p= 0.108) with head of family and also duration of hemodialysis and feeling of dependence, was not significant (p= 1.00).The difference between socioeconomic status before and after hemodialysis was statistically significant (0.001). Respondents are getting hemodialysis with different vascular access; there is association between different vascular accesses for HD to direct cost. There is association between frequency of getting hemodialysis and total cost, it is statistically significant (p=<0.001).

6. Conclusion

Hemodialysis as a lifelong renal replacement therapy is an expensive procedure. It has thus caused the socioeconomic status of the majority of hemodialysis patients to fall despite of Government support to some extent. This study concluded that the hemodialysis affects the social life of respondents as it results majority of respondents lost their job, discontinued their education, sold their belongings like animals/lands/jewelry, and had feeling of financial dependence and isolation in their family. Younger people, single, lower education and lower socioeconomic status have more feeling of financial dependence on others while they get helps financially. People coming from far places having frequent dialysis and receiving dialysis through femoral route had more economical burden than others.

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