# Expenditure for Hemodialysis: A Study among Patient Attending at Hospitals of Pokhara Metropolitan City, Nepal

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**ABSTRACT**

Incidence and prevalence of chronic kidney disease (CKD) is increasing worldwide. It is contributing significantly to deaths and disability. Every year, numbers of cases of renal failure requiring hemodialysis are also increasing. Government of Nepal has made a provision to support the patients undergoing hemodialysis; nevertheless, the patient has to bear the huge financial and psychological burden for dialysis. This study was carried out to study the expenditure made by the patients for dialysis in the Pokhara Metropolitan City Nepal. This was an institution based cross sectional descriptive study. A total of 157 patients who had dialysis or undergoing dialysis at different hospitals of Pokhara Metropolitan City were interviewed using structured interview guideline. Expenditure records of patients were also reviewed. The study was carried out during August to October, 2018. Results are presented in table and diagrams aided by statistical tests like mean, median, standard deviations and ranges. Majority of the patients were male (61.8%). Mean age of the patients under hemodialysis was 49.75±14.91 years. Majorities were Janajati (53.5) and most of them were unemployed (78.3%). Total expenditure made for hemodialysis was NRs. 32,810 (US$ 289.87). The median monthly out of pocket expenditure for haemodialysis per patients was Nepalese Rupees (NRs) 32,810 (US$ 289.87) in which median monthly indirect cost of hemodialysis was NRs 9,200 (US$ 81.28) and median direct cost of hemodialysis per month was NRs 23610 (US$ 208.59). A great majority (78%) of the respondents faced catastrophic health expenditure for dialysis. Patients with renal failure requiring dialysis faced catastrophic health expenditure. The government should focus on programs supporting for dialysis and pay attention on the preventive measures for occurrence of kidney diseases.

**Key words :** Hemodialysis, Expenditure, Patient

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## INTRODUCTION

The state of kidney damage or reduced kidney function that last for three months or longer is known as Chronic Kidney Disease (CKD). It is both progressive and irreversible[1]. CKD is divided into five stages and fifth stage is renal disease with a low glomerular filtration rate (GFR) of 15 ml/min or less. At the fifth stage, the kidneys have lost nearly all their functions and; requiring hemodialysis or a kidney transplant[2].

Dialysis has made an enormous impact on financial status of the patients and their families. It has not only made an adverse impact on the socioeconomic status of patients and their families but also on their psychological wellbeing due to disability, work loss and out-of-pocket expenditure.[3] According to WHO, Out-of-pocket expenditures is defined as direct payments made by individuals to health care providers at the time of service use.[4] The cost incurred by a patient is divided into direct and indirect costs. Direct cost is defined as the amount spent by the patient on physician fees, investigations, hospitalization, dialysis, drugs and disposables. The money spent by patient and family members on travel, accommodation, food (above the usual amount spent in normal health) and loss of income suffered by the patients and family members were categorized under indirect expenses.[5] Catastrophic health expenditure(CHE) is considered when household out-of-pocket expense for health services is ≥40% of its capacity to pay, then that household is considered to be facing CHE.[6]

Government has made dialysis service free however; it does not cover the associated medication cost. Government of Nepal pays NRs 2500 to hospitals per dialysis. Even though government has provided significant amount of money for dialysis, patients have to suffer tremendous out of pocket expenditure.[3] According to DoHS, Nepal, after cancer, Chronic Kidney Diseases (CKD) were the highest numbers of service users;among them, 148 received support for kidney transplantation, 11,648 received hemodialysis service, and 818 people received peritoneal hemodialysis.[7] In Nepal, every year approximately 2,600 new cases of CKDs developed end stage renal disease patient.[8]

Nepal Kidney Foundation reported that there are almost 30,000 people with kidney-related problems and about 3,000 new patients are added to that list each year. The foundation's data is based on informal surveys and interactions with nephrologists and other healthcare providers.[9]

In Nepal, 10% of the total population are suffering from some sort of kidney diseases.[10] For the management of disease the average cost for CKD patient under dialysis was NRs.2, 40,000 per year. Similarly, CKD under medication cost is NRs. 1, 80,000 and the cost for transplantation is NRs.5-10 lakhs available in India and the medication cost for transplanted patients was NRs. 3, 50,200 per year. As the amount is very high for developing country like Nepal, most of the patient cannot afford it and prevent from getting the treatment.[11]

Chronic kidney disease has become a serious public health issue, which could lead to end-stage renal disease (ESRD) and increased cardiovascular morbidity and mortality. In Nepal, Chronic kidney disease patients are increasing and the management of this disease is very expensive compared to other chronic diseases. Though, the government is providing free dialysis service to the public, still it does not covers all the expenditures incurred including indirect costs such as medication, transportation, investigation and other medical bills.

## METHODS

The study was institutional based cross sectional descriptive quantitative study. The study populations were the hemodialysis patients of hospitals of Pokhara Metropolitan City. Both public and private hospital providing dialysis services were selected in the study. The study was carried out during August to October, 2018.

There were total 6 dialysis centers in Pokhara metropolitan city and out of 6 dialysis centers only 5 were included in the study as one of the dialysis centre did not give permission. The sample size was 157 which were determined by using the formula for cross sectional study design. Proportion to population size sampling method followed by simple random sampling was done to select the desired number of participants from the registered patient lists of the dialysis centres. Personal interview and record review were done using semi-structure questionnaire and recording format.

## RESULTS

**Table 1. Distribution of respondents by socio-demographic characteristics (n= 157)**

| Variables | Frequency | Percentage |
|---|---|---|
| **Age (in years)** | | |
| ≤30 | 14 | 8.9 |
| 31-40 | 27 | 17.2 |
| 41-50 | 42 | 26.8 |
| 51-60 | 32 | 20.4 |
| 61-70 | 25 | 15.9 |
| ≥71-80 | 17 | 10.8 |
| Mean age 49.75, SD 14.91, minimum 19 years, maximum 92 years | | |
| **Gender** | | |
| Male | 97 | 61.8 |
| Female | 60 | 38.2 |
| **Marital Status** | | |
| Unmarried | 11 | 7.0 |
| Married | 138 | 87.9 |
| Single | 2 | 1.3 |
| Widow | 6 | 3.8 |
| **Family Type** | | |
| Nuclear | 66 | 42.0 |
| Joint | 88 | 56.1 |
| Extended | 3 | 1.9 |
| **Religion** | | |
| Hindu | 124 | 79.0 |
| Buddhist | 20 | 12.7 |
| Christian | 10 | 6.4 |
| Islam | 3 | 1.9 |
| **Caste** | | |
| Brahmin | 29 | 18.5 |
| Chhetri | 20 | 12.7 |
| Janajati | 84 | 53.5 |
| Dalit | 20 | 12.7 |
| Others | 4 | 2.5 |
| **Education status** | | |
| Illiterate | 34 | 21.7 |
| Informal education | 18 | 11.5 |
| Basic education | 52 | 33.1 |
| Secondary level | 38 | 24.2 |
| Bachelor | 12 | 7.6 |
| Above bachelor | 3 | 1.9 |
| **Occupation** | | |
| Unemployed | 123 | 78.3 |
| House wife | 18 | 11.5 |
| Agriculture | 8 | 5.1 |
| Government employment | 2 | 1.3 |
| Service | 1 | .6 |
| Others | 5 | 3.2 |

Table 1 shows that 26.8 percent of the respondents were of age group 41-50 years and the mean age being 49.75 ±14.91years; minimum 19 years and maximum 92 years. Majority (61.8%)) of the respondents were male, married (87.9%) and belongs from joint families (56.1%). Similarly, majority (79.0%) was Hindus, followed by 12.7 percent Buddhist, 6.4 percent) Christian and 1.9 percent were Islams respectively. Majority was Janajati (53.5%). Almost one-third (33.1%) had basic level education 11.5 percent had informal education only1.9 percent had above bachelor level education. Majority (78.3%) of the participants were unemployed.

**Table 2: Indirect cost of haemodialysis per month**

| Indirect Costs ( in Nepalese Rupees) | Median |
|---|---|
| Transportation fees | 1200 |
| Cost for food | 1200 |
| Money spent in caretaker | 1200 |
| Money loss by patients/ caretaker work loss days | 5600 |
| Total indirect cost | 9200 |
| US$ | 81.28 |

Note: 1 US$= 113.19RS exchange rate, 2 September, 2018

Table 2 shows overall monthly indirect cost of hemodialysis. The median monthly indirect cost of hemodialysis was NRs 9200 (US$ 81.28) which included median transportation fees, cost for food, money spent in caretaker and loss of salary by patients and caretaker due to loss in working days.

**Table 3: Direct cost of hemodialysis per month**

| Direct costs | Median |
|---|---|
| Physician fee | 1500 |
| Admission fee | 1200 |
| Medicine cost | 4250 |
| Injection cost | 7260 |
| Blood investigation cost | 1850 |
| Blood transfusion cost | 2000 |
| Emergency | 5550 |
| Total direct cost NRS | 23610 |
| US$ | 208.59 |

Table 3 shows the overall monthly direct cost of hemodialysis. The median direct cost of hemodialysis per month was NRs 23610 (US$ 208.59) which included median physician fee, admission fee, medicine cost, injection cost, blood investigation cost, blood transfusion cost and emergency cost.

**Table 4: Out of pocket expenditure of hemodialysis patients per month**

| Direct and Indirect cost | Median monthly expenditure |
|---|---|
| Transportation fees | 1200 |
| Cost for food | 1200 |
| Money spent in caretaker | 1200 |
| Money loss by patients and caretaker due to loss in working days | 5600 |
| Physician fee | 1500 |
| Admission fee | 1200 |
| Medicine cost | 4250 |
| Injection cost | 7260 |
| Blood investigation cost | 1850 |
| Blood transfusion cost | 2000 |
| Emergency | 5550 |
| Total (NRS) | 32810 |
| US$ | 289.87 |

Table 4 shows the overall monthly out of pocket expenditures among hemodialysis patients which include both direct and indirect cost NRs 32810 (US$ 289.87).

**Figure 1: Catastrophic health expenditure among hemodialysis patients**

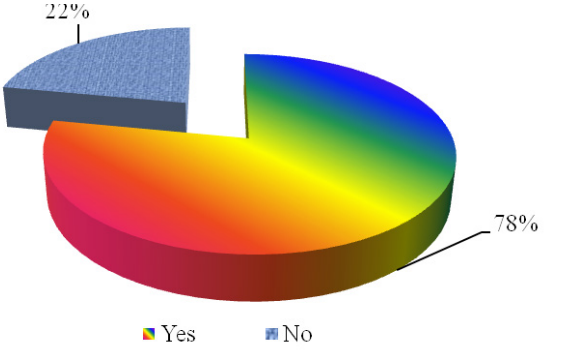


Figure 1 shows the catastrophic health expenditure among hemodialysis patients. The study showed that great majority of the respondents (78%) faced catastrophic health expenditure. This result showed that many people are suffering from economic burden due to this chronic disease.

## DISCUSSION

### Direct and indirect cost of hemodialysis per month

The study showed that median monthly indirect cost of hemodialysis was NRs9200 (US$ 81.28) and the median

direct cost of hemodialysis per month was NRs23,610 (US$ 208.59). In a study conducted in Africa, the median direct cost was $ 12,679 and indirect cost was $ 902. The high difference in direct and indirect cost was because of the components included in the direct and indirect cost. Direct cost included direct medical costs (outpatient consultation fees, dialysis consumables, dialysis session fees, drugs, laboratory and radiological tests) and non-medical direct costs (the cost of transport, feeding, water and electricity) and indirect cost included only costs related to the monthly loss of productivity for patients and their caretakers. The difference in cost from this study could be due to many factors including the methods used in estimating costs and differences in local import, drugs, laboratory tests and the costs of consumables and also the annual per capita income of countries[12].

**Monthly Out of pocket expenditure of hemodialysis patients**

In this study the median monthly out of pocket expenditure among hemodialysis patients was NRs32810 (US$ 289.87) which included all the direct costs (physician fee, medicine cost, blood investigation cost, blood transfusion cost and emergency cost) and indirect costs (transportation cost, cost for food, caretaker cost and money loss by patients and caretaker due to loss in working days). In a study conducted in National Kidney Centre, Banasthali, Kathmandu, Nepal, the average amount spend by the patients who were under hemodialysis was NRs20,000 (US$ 176.69) per month which included cost of dialysis, investigation, medicine, bed charge and transportation[11]. This difference in cost is because the study didn't include the cost for food, caretaker cost and money loss by the patients and caretaker due to loss in working days. Likewise, in a study conducted in India, the mean out of pocket expenditure per patients per hemodialysis session was INR 2838 (US$ 44)[13] which was low as compare to this study. This difference may be due to better health system of India than in Nepal. In Nepal, health system incurs NRs2500 (US$ 22.08) per dialysis on free dialysis services whereas in India, the overall average cost incurred by the health system per dialysis session was INR 4148 (US$64). In a study conducted in Africa, The annual median out of pocket payments of hemodialysis per patient was $ 4114[12] which was little bit different from this study which may be explained by many factors including the annual per capita income of countries, the methods used in estimating costs and differences in local import, drugs, laboratory tests and the costs of consumables. In a study conducted in Srilanka, the median monthly out-of-pocket expenditure of a patient on dialysis was Rs. 5940 (IQR 3950-10935)[3] which is very low as compare to this study because it did not include the cost of investigation, caretakers cost and also money loss by the patients and caretaker due to loss in working days. In a study conducted in Brazil, the annual cost of hemodialysis was $280570[14] and in study conducted in Tanzania, the average annual cost was $27440[15]. One of the reasons for our lower cost is that we did not include the staff and building costs as has been done in their study.

**Catastrophic health expenditure among hemodialysis patients**

This study showed great majority of the respondents faced catastrophic health expenditure which was more than three-fourth of the respondents. In a study conducted in India, assuming two dialysis sessions in a week, the patient experiences 38.1% catastrophic spending which increases to 52% with thrice-weekly hemodialysis[13]. The difference in catastrophic health expenditure among hemodialysis with this study was due to better health system through adequate government provisions of India than in Nepal. In Nepal, health system incurs RS 2500 (US$ 22.08) per dialysis on free dialysis services whereas in India, the overall average cost incurred by the health system per hemodialysis session was INR 4148 (US$64)[13].

## CONCLUSION

The median monthly out of pocket expenditure among hemodialysis patients was NRs. 32,810 (US$ 289.87). Majority of the respondents faced catastrophic health expenditure for hemodialysis. The government should focus on programs supporting for dialysis and pay attention on the preventive measures for occurrence of kidney diseases.

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