

HEALTH EXPENDITURES IN THE FAMILIES AND ITS RELATION TO NON COMMUNICABLE DISEASES AND MULTI-MORBIDITY AMONGST ITS ADULT MEMBERS IN SELECTED WARDS OF KAGESHWORI MANOHARA MUNICIPALITY, KATHMANDU, NEPAL

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ABSTRACT

Healthcare services, one of the basic necessities of life, are meant to provide social protection to the households but its rising cost has put financial burden on them. The rise in the prevalence of non-communicable disease as well as multi-morbidity as a result of increased life expectancy has added to this cost burden the households as the treatment is likely to be needed throughout the lifetime. As a part of National Health Insurance Program in an attempt to address the problem of high healthcare expenditures, the local government has recruited enrollment assistants from each ward to conduct home visit, explain families about the benefits of health insurance and enroll them in this national scheme. Hence it is very important that the data related to health expenditures incurred by family members in a year is available in the wards. Community based survey was carried out in ward 3 and 2 of Kageshwori Manohara Municipality of Kathmandu District, Nepal, in September 2023 and April 2024, respectively. Out of 848 households covered, annual health cost incurred by the family as a part of their annual income could only be obtained from 793 households (93.5%). Out of these households, health cost exceeded 10% of their annual income in 28.4% of the households and this was significantly associated with a household member having a non-communicable disease and multi-morbidity. Households living below the poverty line set at NRs. 200/person/day was seen to be significantly associated with having catastrophic health expenditure i.e. exceeding 10% of their annual income.

KEYWORDS

Health expenditures, non-communicable diseases, adults, Kageshwori Manohara

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INTRODUCTION

Out of pocket (OOP) expenditure in healthcare is defined by WHO as a share of current health expenditure funded by households out of pocket.¹ Paying for the healthcare services OOP leads to financial hardships and this is more pronounced in low income countries where health system is poorly funded. A study done in 1994/95 AD, Nepal Living Standard Survey (NLSS-I), found out that the financing healthcare by OOP was the major burden to Nepalese households but this study did not extend its analysis to what extent it affected the household economy.² The National Health Accounts (NHA) 2006/2007 to 2008/2009 of Nepal, a survey done around a decade later, showed that the total and per capita health expenditure grew substantially over the years and 55% of the total health expenditure was OOP.³ Catastrophic health expenditure (CHE) is said to have occurred when the medical spending of a household exceeds a certain level of capacity to pay.⁴ Different studies on CHE have used 10%, 20% and 40% of the annual income of the household as cut off point to determine if the health expenditure in a year was catastrophic in nature.^{5,6} It has been shown from studies that having a family member with non-communicable disease (NCDs) can lead to catastrophic health expenditure in the family as NCD tend to be of long duration requiring long term care.⁷ Similarly, multi-morbidity (MM), the coexistence of two or more chronic conditions in an individual has also been associated with CHE.⁸ Along with increase in age in the adulthood demand for healthcare along with the cost also increases. A four-year analysis of National Health Accounts (2012/13 – 2015/16) reported that OOP expenditure for health conditions was highest for NCDs with common NCDs being cardiovascular diseases, diabetes, chronic respiratory diseases and cancers. To reduce OOP and CHE the Government of Nepal has implemented Health Insurance Program.⁹ Local governments, which is one of the government tiers as per federal structure of Nepal, recruit enrollment assistants from each ward of the local municipality to conduct home visits to explain the importance of health insurance, enroll households and collect the premium.¹⁰ Hence it is very important that data on health related expenditures and also about the prevalence of NCDs and MM in the adult household members is available at the level of ward, which is the simplest administrative unit of Nepal.

Kageshwori Manohara, an urban municipality is one of the 753 local municipalities (*Palika*

of Nepal. It lies in Kathmandu District, one of the 77 districts, and Bagmati Province, one of the 7 provinces, of Nepal. Along with 9 wards it has the population of 1,30,433 and the highest growth rate of 7.41% amongst all the municipalities.¹¹

MATERIALS AND METHODS

The ethical approval was taken from the Institutional Review Committee of Nepal Medical College (Ref. No: 19-080/81) to carry out a community based survey in the selected wards of Kageshwori Manohara Municipality. Permission was also taken from the two ward offices before the survey. The objective of the survey was to collect data on annual health expenditures of households of those wards and to see if presence of NCDs and MM in the adult members of households was associated with high health expenditures. The households were selected as per convenience. The survey was carried out in ward 3 in September 2023 and in ward 2 in April 2024. As the data collected was a part of the academic program of community diagnosis of MBBS and BDS students, permission was also taken from the Head of Department of Community Medicine for the data to be used in the survey.

The total number of households in ward 2 and 3 of Kageshwori Manohara Municipality is 752 and 683, respectively.¹¹ From ward 2 (which is also known by the name Alapot), 431 households were covered which is 57% of the total households. Similarly, from ward 3 (also known by the name Bhadrabas), 415 households were covered which is almost 61% of the total households in the ward. Local volunteers were also used for communication and coordination between the household members and data collectors. The category of caste used in this study is based on Nepal Population and Housing Census 2021 and the book on *Dalit Representation in National Politics of Nepal*.^{11,13}

Modified Kuppaswami scale in context to Nepal was used to set category for monthly family income.¹⁴ Nepal Living Standard Survey IV 2022-23 has set poverty line for a person as living below Nepali rupees 199.75 per day and it was shown in the survey that the richest 20% have per capita income approximately above NRs. 700 per day. These standards have been used as the basis to categorize per capita income in a day.¹⁵

The data was entered in SPSS-16 and descriptive statistics was applied. Alpha value of less than 0.05 was considered to be statistically

significant. A copy of research paper after publication will be provided to the Ward Office of the municipality.

RESULTS

As shown in Table 1, out of the total number of households (848), more than one third belonged to *Kshetri* caste followed by the *Brahmins* whose number was almost one third of the total households covered. This was followed by *Newar* caste (almost 18.0%), *Tamangs* (almost 6.0%) and *Dalits* (almost 4.0%). The mean household size was 4.6 with almost one fourth of the households having 3 or less family members and 10.0% of the families having more than 6 members in their family. Only 822 households gave data related to the income which comprised almost 97.0% of the total households covered. The median value of monthly income was NRs. 40,000 (Q1-

Table 1: Sociodemographic profile of the surveyed households (n=848)

Caste / Ethnicity	n	%
<i>Kshetri</i>	316	37.3
<i>Brahmin</i>	266	31.4
<i>Newar</i>	149	17.6
<i>Tamang</i>	48	5.6
<i>Dalit</i>	33	3.9
Others	36	4.2
Number of family members and the mean household size of the family		
<4	196	23.1
4-6	566	66.8
>6	86	10.1
Mean household size	4.6	
Monthly and median income of the family in NRs. (N=822)		
<36551	378	46.0
36551- 48750	113	13.7
48750- 97450	226	27.5
> 97450	105	12.8
Median income, Q1 and Q3	40,000 (25,000-60,000)	
Income per person per day in NRs. (N=822)		
<200	208	25.3
200- 499	432	52.6
500- 699	115	14.0
700 or more	67	8.1
Median value, Q1 and Q3	292 (194-444)	
Living in rented house		
Yes	123	14.5
No	725	85.5

Table 2: NCDs and multi-morbidity in the households (n=848)

Number of household members with the given condition	n of households	% of total households
NCDs		
0	327	38.6
1	326	38.4
2	161	19.0
>2	34	4.0
MM		
0	644	75.9
1	176	20.8
2	28	3.3

Table 3: Annual income spent on health amongst household members (n=793)

	Households (n)	%
Up to 10%	568	71.6
>10% to 20%	135	17.0
>20% to 40%	65	8.2
>40%	25	3.2
Median annual health cost in NRs.	20,000 (Q1-10,000 , Q3-50,000)	

25,000, Q3- 60,000). Amongst these households around one fourth were living below poverty line (<NRs. 200/person/day) and around 8.0% of the households had per capita income of NRs 700 or more in a day. The median value for per capita income in a day was NRs. 292 (Q1-194, Q3- 444). Almost 86.0% of the total households were living in their own property and around 15.0% of them were living in rent.

As can be seen from Table 2, out of 848 households almost 39.0% of the households had no member with NCD and almost 76.0% of the total households had no member with any multi-morbidity. Sixty-one percent of the total households had a member with NCD. Around 38.0% had a single member with NCD, 19.0% had 2 members with NCD and in 4.0% of the households, more than 2 members had NCD. Similarly, around 3.0% of the households had 2 members with MM and almost 21.0% had one member with MM. The most common NCDs in this study was cardiovascular diseases followed by diabetes, chronic respiratory diseases and thyroid disorders.

Table 3 shows annual health expenditure as percentage of annual income of households. Only 93.0% of the total households were able to give this data. The median annual health cost of the households was NRs. 20,000 (Q1- 10,000,

Table 4: Association between presence of NCD and MM in household members and CHE using 10% of annual income as cut off point (n=793)				
	CHE (>10%) n(%)	No CHE		P value
Presence of NCD in family				
Yes	169 (21.3%)	315 (39.7%)	484 (61.0%)	<0.0001
No	59 (7.5%)	250 (31.5%)	309 (39.0%)	
	228 (28.8%)	565 (71.2%)	793 (100%)	
Presence of MM in the family				
Yes	79 (10.0%)	123 (15.5%)	202 (25.5%)	0.0002
No	149 (18.8%)	442 (55.7%)	591 (74.5%)	
	228 (28.8%)	565 (71.2%)	793 (100.0%)	

Table 5: Association between presence of NCD and MM in household members and CHE using 20% of annual income as cut off point, n=793				
	CHE (>20%)	No CHE		P value
Presence of NCD in family				
Yes	72 (9.1%)	412 (51.9%)	484 (61.0%)	<0.0001
No	18(2.2%)	291(36.8%)	309 (39.0%)	
	90 (11.3%)	703 (88.7%)	793 (100%)	
Presence of MM in the family				
Yes	30 (3.8%)	172 (21.7%)	202 (25.5%)	0.07
No	60 (7.5%)	531 (67.0%)	591 (74.5%)	
	90 (11.3%)	703 (88.7%)	793 (100.0%)	

Table 6: Association between poverty status and CHE (Health expenditure >10% of annual income), n=793				
	CHE n (%)	No CHE		P value
Households living below poverty line (< 200 NRs. per person per day)				
yes	83 (10.5%)	116 (14.6%)	199 (25.1%)	<0.0001
no	145 (18.3%)	449 (56.6%)	594 (74.9%)	
	228 (28.8%)	565 (71.2%)	793 (100%)	
Spearman' correlation coefficient between per capita income per day and % of annual income spent on health		-0.32		

Q3- 50,000). Out of the data obtained 71% of the households had health expenditure that did not exceed 10.0% of the annual income. Of the remaining around 28.0% had their annual health expenditure exceeding 10.0% of the annual income, 11.0% had it exceeding 20.0% of the annual income and for around 3.0% of the household annual health expenditure exceeded 40.0% of their annual income.

It can be seen from Table 4 and Table 5 that the presence of NCD in family was significantly

associated with health expenditure exceeding 10.0% as well as 20.0% of the annual income (P <0.0001 in both the cases) with families having a member with NCD having higher odds of CHE. The association between a family member having MM and CHE was found when the cut off value for health expenditure was 10.0% of the annual income with family having a member with MM spending more on health (P =0.0002). However, there was no significant association when CHE cut off point was set at 20.0% of the annual income (P =0.07)

As seen in the Table 6, families living under NRs. 200 per person in a day is significantly associated with facing CHE with cut-off point as 10.0% of the annual income. Spearman's correlation analysis between per capita income per day of the family and their percentage of annual income spent on health showed weak to moderate negative correlation with coefficient value of -0.32.

DISCUSSION

The caste distribution amongst the participant households of this study is similar to that of Kageshwori Manohara Municipality with *Kshetris* and *Brahmins* occupying almost two thirds of the total population.¹¹ However the third most common caste is *Tamang* followed by the *Newar* in this urban municipality where as in this survey there were more *Newar* household participants in the two wards. According to the latest Nepal Population and Housing Census 2021, more than 55.0% of the families in these two wards are extended forms of families unlike other majority of the wards of this municipality where more than 50.0% of the families are nuclear families. Amongst the households involved in this study the mean household size was 4.6 and almost 77.0% had their number of members more than three, more likely in the extended families. The 2021 census report of Nepal also shows that only around 3.0% of the total households in the municipality come under poor wealth quintile but in this study around one fourth of the households were living below poverty line of NRs. 200 per person in a day (criteria used in National Living Standard Survey IV, 2022-23). As per the census in both the wards 80.0% of the households are living in self-owned property which is similar to the findings of this study where almost 86.0% of the households were living in self-owned property.

A survey conducted in Thaha Municipality of Makwanpur District, Nepal in November / December 2018, which included more than 80.0% of the registered households of the municipality showed that more than 50.0% of the respondent households had at least one member with a chronic health problem.¹⁶ Similarly, a study done on the adult family members of 200 students of Rangpur district, Bangladesh showed that out of 356 adult participants, almost 29.0% had hypertension and this research paper was published in the year 2020.¹⁷ In this study 61.0% of the total households had at least one member with NCD and 23.0% of the households had 2 or more members with NCDs.

The first study to assess the burden of MM in Nepal (NCD survey 2018) showed that the prevalence was almost 14.0% in Nepal with Bagmati Province having the highest proportion of MM (16.0-19.0%).¹⁸ In our study around 24.0% of the households had at least one member with MM and in around 3.0% of the households 2 members had MM. Patients with MM are high utilizers of healthcare resources and are some of the costliest and difficult-to-treat patients in Europe.¹⁹

In this study around 28.0% of the households had their annual health expenditure exceeding 10% of their annual income and around 11.0% had it exceeding 20.0%. A study which used data of 5988 households from Nepal Living Standard Survey III (2010-11) showed that 11.0% of the households had faced CHE. It was more than 13.0% in the households of Karnali and Sudur Paschim Province, the provinces which is relatively underdeveloped than the other provinces of Nepal and it was 10.7 % in Bagmati Province. However, this study had used annual health expenditure exceeding 40.0% of non-food expenditures as a cut off point for CHE.²⁰ Another study was done in Pokhara metropolitan city (which lies in central part of Nepal) in the mid-2020s involving 1276 households. As a cut off point for CHE, it used more than 10.0% of the family annual income being spent on healthcare and it was shown that 6.4% of the total households faced CHE.²¹ A study carried out on 1405 industrial workers in Eastern Nepal in June-October 2017 using 20.0% of the annual income as cut off point for CHE showed its prevalence to be 13 percent.²²

In this study significant association was found between presence of NCD in the family and CHE. When 10.0% of the annual income was used as the threshold for CHE, significant association was seen between a family member having MM and CHE but when the cut off point for CHE was set at 20.0% of the income the association between these two variables was not significant. A study carried out in 1997 households of Kathmandu in 2012 showed that CHE was mostly associated with NCDs such as diabetes and asthma.²³ A study carried out in 2017-18 in the rural and urban areas of Kerala, India on 420 adults above 39 years of age showed a strong association between having MM and CHE.⁸

This study has also showed that households living below poverty line was significantly associated with undergoing CHE as shown in Table 6. However, there was no strong

correlation to suggest that the burden of health expenditure on households increased along with the decrease in per-capita income. A study done in 677 households of Ilubabor zone of Ethiopia in 2020 showed that average daily income of less than 1.9 US dollar was significantly associated with experiencing CHE.⁵ Government of Nepal allocates budget annually for impoverished households in providing 100.0% free treatment but it faces challenging task of endorsing legal documents to identify poor households and provide health services when needed.¹⁰

The global population is aging, and so is the Nepali population. Increasing age is a risk factor for various NCDs and MM and this is associated with increased use of health services leading to high health care expenditures.²⁴ Studies have shown that NCDs are also being diagnosed at an early adulthood.²⁵ Health insurance is the solution to address problems faced by household members due to high healthcare costs. However, high drop out rates and low interest in the renewal of premiums are one of the many challenges faced by national health insurance program of Nepal at present.¹⁰

The Social Security Fund, created under Social Security Act of Nepal issued in 2018 also finances medical treatment costs, maternity related costs and costs for treating accident related injuries to the employees.²⁶ However, there are challenges in extending this contribution based social security scheme to the workers in the informal sector, which is the sector of economy that is neither taxed nor monitored by the government. In Nepal in 2018, formal employment accounted for approximately one million jobs, mostly concentrated in larger organizations. On the other hand, about 6 million workers were engaged in informal employment, amounting to 84.6% of all the employed population.²⁷ A study done using the data of two rounds of the Household Integrated Economic Survey (2015-16, 2018-19) in Pakistan demonstrated that the probability of incurring CHE and becoming impoverished was high among worker in the informal sector.²⁸

Nepal's 2015 constitution established a three tier federal structure restructuring the nation into 753 local governments from its previous centralized governance. The main purpose of this decentralized form of governance was to bring public services, of which health is also major one, closer to the citizens residing in that area. An analysis report published in 2019 on health financing of Nepal carried out by Ministry of Health and helped by WHO and World Bank has suggested that Local

and provincial governments need to plan mechanisms for collecting revenues and pooling funds beyond the transfers from the Central government and need to increase their ability to efficiently implement health budgets according to their needs.²⁶ Increase in Public Health Expenditure at local level is one of the ways to lessen the burden of OOP health expenditure on households.

Hence to prevent catastrophic expenditures on health, tentative data related to healthcare cost made by families need to be obtained. As there is provision of enrollment assistants for health insurance in every ward office of Nepal, having such data in ward office can be very useful in enrolling and retaining the families living in the ward in health insurance schemes. It should also be realized that ending the financial burden related to healthcare on households depends not only on health related policies. People based schemes on sectors related to the labor and employment and social welfare can have immense contribution in making these health financing schemes effective and efficient with the local government and its ward offices playing a vital role of mediation between the households and service providers. With the proper regulation and monitoring even private sector can be involved in health insurance schemes. Prevention of disease is better than the cure and same applies to preventing CHE amongst the households.

Limitations –The data was provided verbally by the participants there may have been recall bias or reluctance in providing the exact data related to the family income and healthcare costs. We collected data according to our convenience so some parts of the wards which was relatively inaccessible may have been left out.

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