Financial burden of tobacco and catastrophic health care expenditure among smokers admitted in a tertiary care center in eastern Nepal

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ABSTRACT

Tobacco users can deprive their families of income, raise the cost of health care and hinder economic development. Thus, a study was designed to document total out-of-pocket health expenditure and catastrophic payments among the tobacco users admitted to a hospital. A survey was done among the fifty users of tobacco and its products who were admitted in BP Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal from September 2013 to February 2014. Data was gathered at the day of their discharge through face-to-face interviews. The data was analyzed by Statistical Package of Social Sciences (SPSS) version 16.0. Chicago, SPSS. Inc. The average duration of the hospital stay was 8.52 ± 1.72 days and more than one thirds (46.0%) of patients had previous history of hospitalization with average frequency of 5.64± 2.25. The patients spent about 3 percent of the annual per capita income on tobacco and its products. On an average, the patients spent Nepali Rupees (NPR) 57,215 on a single episode of hospitalization which is NPR 9000 more than average annual per capita income of the patients. A staggering 40 % of the patients experienced catastrophic health care expenditure. The indirect costs constituted a considerable (07.88%) percentage of the total health careexpenditure.The study shows high catastrophic health expenditure among tobacco users who get admitted repeatedly which can make them impoverished. Health financing schemes can be adopted by patients which can protect them from financial risks due to health care expenditure.

Keywords: catastrophic, out-of-pocket, tobacco user.

INTRODUCTION

According to WHO, the tobacco epidemic is one of the biggest public health threats the world has ever faced, killing nearly six million people a year.[1] Nearly 80% of more than one billion smokers worldwide live in low- and middle-income countries, where the burden of tobacco-related illness and death is heaviest. Tobacco users who die prematurely deprive their families of income, raise the cost of health care and hinder economic development.In some countries, children from poor households are frequently employed in tobacco farming to provide family income.[2]

Out-of-pocket (OOP) payments are the principal means of financing health care throughout much of Asia. Bangladesh, China, India, Nepal and Vietnam rely heavily on OOP financing and have highest incidence of catastrophic payments which severely disrupts household living standards and absorbs significant fraction of household resources.[3] The per person investment in health by the state for their public in the developing countries is remarkably lower compared to developed nations.[4] The costs of the disease may vary according to the types of diseases, level of health care providers, the number of days spent in the hospital. Annual health care costs are higher for smokers, and the burden of these costs falls on families, the public purse, and employers/insurers. Earnings and productivity losses because of tobacco-related illness and premature death can be huge, and are borne by employers and employees.[5] And an insidious, often overlooked cost arises from the impact on the well being of poor families in which scarce income is used for cigarettes and other tobacco products. It is not unusual for households that include one or more smokers to spend between 2 and 10% of the family income on tobacco products. For a poor family, that has a very high opportunity cost. It can mean that a child goes hungry, or is kept out of school, or that a sick family member does not see a health care workers or get medicines when necessary.[6]

Nepal is a country with lowest Human Development Index (HDI) rankings among South Asian Association for Regional Cooperation (SAARC) countries aside from Afghanistan.[7] Various studies have shown that among the 11 countries in Asia, Nepal has highest reliance on out-

of-pocket payments to finance health care, and charges for public-sector care account for more than 40% of total out-of-pocket payments. Also evidence suggests that Nepal has the highest poverty rates, which increased further when OOP health expenditure was subtracted from the total resources of the household.[8-9]

With this background, a study was designed to elicit tobacco history and document total out-of-pocket health expenditure (direct and indirect costs) among the admitted patients on a single episode of hospitalization. The study also aims to find out the presence of catastrophic expenditure on health care among the admitted patients. In the present context, this study will be able to highlight the relationship between health and economics, cost and diseases. The knowledge about patient's direct and indirect costs may help in developing a strategy to help the patients cope with these expenses. The expenditure on tobacco will also probe the patients to think about the financial implications and alternative uses of the money spent on tobacco consumption.

MATERIALS AND METHODS

A survey was conducted among the patients who were admitted in the inpatient ward of Department of Internal Medicine, BP Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal from September 2013 to February 2014. Patients who were users (past and present) of tobacco and its products were included in the study. A total of fifty patients were enrolled through a non-probability sampling method**.** The tobacco history was elicited with the help of questions of WHO Global Adult Tobacco Survey while the costs related questions were framed with the help of literature review. Estimates of the costs of tobacco, food expenditure and out-of-pocket expenditure on health care for current episode of hospitalization were made through face-to-face interviews at the day of their discharge.

Non-food expenditure per month was calculated by subtracting monthly food expenditure (i.e. amount of household spending on things as rice, meat, fruits, vegetables, and cooking oils...include the value of any food that was produced and consumed by the household, and exclude alcohol, tobacco and restaurant meals) and monthly savings from family income per month. The monthly non-food expenditure was then multiplied by 12 to calculate annual non-food expenditure. The expenditure values were reported in Nepali currency (NPR) and were converted into US Dollars by using exchange rate of 1 USD is equal to NPR 100. The health care expenditure was considered catastrophic if it exceeded 40 per cent of the annual non-food expenditure of the households.

The data was entered, edited and coded in Microsoft Excel. The data was exported to SPSS version 20.0 for further analysis. The descriptive statistics like mean, median, standard deviation and inter-quartile range etc. were calculated. The frequency and percentages were displayed through frequency distribution tables. Ethical approval was taken from the Institutional Ethical Review Board (IERB) of BPKIHS for conducting the study. Informed written consent was taken from all the patients included in the study. Confidentiality and anonymity of the study respondents was assured and maintained.

RESULTS

More than half (58.0%) of the participants were males and majority (90.0%) of the patients were married. Half of the respondents were employed however, about two thirds had not received any formal education. The average family size of the study respondents was 5.64 and with average age of 60 years. The average length of the hospital stay was around 9 days. More than one thirds (46.0%) of the patients had previous history of hospitalization and on an average they had been admitted 6 times in the past. (Table 1)

Table 1: Socio - demographic characteristics and details of hospital stay of the study participants.

Variables	Categories	Frequency	Percent
Sex	Male	29	58.0%
	Female	21	42.0%
Marital Status	Unmarried	05	10.0%
	Married	45	90.0%
Occupation	Student	01	02.0%
	Housewife	18	36.0%
	Employed	25	50.0%
	Retired	06	12.0%
Education	No formal education	32	64.0%
	Primary School	10	20.0%
	Secondary School	07	14.0%
	+ 2 and above	01	02.0%
Average family size (mean ± sd) = 5.64 ± 2.25			
Age in years (mean ± sd) = 59.6 ± 17.3 years			
Average duration (in days) of current hospital stay (mean ± sd) = 8.52 ± 1.72 days			
Previous history of hospitalization	Yes	23	46.0%
	No	23	54.0%
Frequency of previous hospitalization (mean ± sd) = 5.64 ± 2.25 times			

More than one fourth, (28.0%) of the patients were current daily smokers and majority (94.3%) had positive past history of daily cigarette smoking. Manufactured and hand rolled cigarettes were the

two most commonly used smoked tobacco products by the study respondents. On an average, the patients smoked about 6 sticks and 9 sticks of manufactured and hand rolled cigarettes per day respectively. In matter of smokeless tobacco use, 22 percent were using it daily and about 8 per cent of patients gave a past positive history of daily smokeless tobacco use. (Table 2)

Table 2: Questions related to MONITOR tobacco use and prevention policies

Variables	Categories	Frequency	Percent
Current use of smoked tobacco	Yes, daily	14	28.0%
	Yes, not daily	01	02.0%
	Not at all	35	70.0%
	Don't know	00	00.0%
If not current smoker, smoking daily in the past (for current less than daily smokers i.e. n = 1)	Yes	00	00.0%
	No	01	100.0%
Past history of smoked tobacco use (for current non-smokers i.e. n = 35)	Yes, daily	33	94.3%
	Yes, not daily	02	05.7%
	Not at all	00	00.0%
	Don't know	00	00.0%
Type of products used by the current smokers i.e. n = 15	Manufactured cigarettes	09	60.0%
	Hand rolled cigarettes	02	13.3%
	Both	04	26.7%
Average number of smoking of manufactured cigarettes (n=15)		6.26 cigarettes /day	
Average number of smoking of hand rolled cigarettes (n =15)		9.08 cigarettes /day	
Current use of smokeless tobacco	Yes, daily	11	22.0%
	Yes, not daily	01	02.0%
	Not at all	38	76.0%
	Don't know	0	00.0%
If not current, smokeless tobacco use daily in the past (for current less than daily users i.e. n=1)	Yes	00	00.0%
	No	01	100.0%
Past history of smokeless tobacco use (for current non-user i.e. n = 38)	Yes, daily	03	07.9%
	Yes, not daily	04	10.5%
	Not at all	31	81.6%
	Don't know	00	00.0%

With respect to second hand smoking, 16 per cent gave history of daily passive smoking by someone at home and about half of them were exposed to second hand cigarette smoke at their workplace. (Table 3)

Table 3: Questions related to PROTECT people from tobacco smoke

Variables	Categories	Frequency	Percent
History of indoor smoking	Daily	08	16.0%
	Weekly	01	02.0%
	Monthly	00	0.0%
	Less than monthly	00	0.0%
	Never	31	62.0%
Current work outside	Yes	13	26.0%
	No	37	74.0%
	Don't work	00	0.0%
Usually work	Indoors	35	70.0%
	Outdoors	13	26.0%
	Both	02	04.0%
Indoor smoking in last 30 days at workplace	Yes	22	44.0%
	No	19	38.0%
	Don't know	09	18.0%

Among the current smokers, more than two thirds (73.3%) had tried to stop smoking in last one year. Of the total current smokers, 60 % had visited a health care provider in last 12 months and 53.3% were advised to quit smoking tobacco. (Table 4)

Table 4: Questions related to OFFER help to quit tobacco use

Variables (for current smokers)	Categories	Frequency (n =15)	Percent
Tried to stop smoking in last one year	Yes	11	73.3%
	No	04	26.7%
Visited health care provider in last 12 months	Yes	09	60.0%
	No	06	40.0%
During visit to health provider, advised to quit smoking tobacco	Yes	08	53.3%
	No	07	46.7%

More than one fifth, (22.0%) had noticed hazards of smoking cigarettes in newspapers in last 30 days and a much larger percentage (34.0%) noticed similar warnings on television which encouraged them to quit. However, the current smokers did not notice health warnings on cigarette packages in last 30 days which could have led to quitting of the smoking habit. (Table 5)

Table 5: Questions related to WARN about the dangers of tobacco

Variables	Categories	Count	Percent
Noticed information on hazards of smoking cigarettes in newspapers/magazines in the last 30 days which encouraged to quit	Yes No	11 39	22.0% 78.0%
Noticed information on hazards of smoking cigarettes on television in the last 30 days which encouraged to quit	Yes No	17 33	34.0% 66.0%
Noticed health warnings on cigarette packages in last 30 days (for current smokers i.e. n = 15)	Yes No	0 15	00.0% 100.0%
Warning labels on cigarette package in last 30 days led to think about quitting (for current smokers i.e. n=15)	Yes No	0 15	00.0% 100.0%

Promotion signs in stores where cigarettes are sold were observed by only one study participant and no other cigarette promotions were noticed by any of the respondent. (Table 6)

Table 6: Questions related to ENFORCE bans on tobacco advertising, promotion and sponsorship

Variables	Categories	Frequency	Percent
Noticed promotion signs in stores where cigarettes are sold in last one month	Yes No	01 49	02.0% 98.0%
In last 30 days, notice of following types of cigarette promotions? a. Free sample of cigarettes	Yes No	0 50	0.0% 100.0%
b. Cigarettes at sales prices	Yes No	0 50	0.0% 100.0%
c. Coupons for cigarettes	Yes No	0 50	0.0% 100.0%
d. Free gifts or discounts	Yes No	0 50	0.0% 100.0%
e. Clothing or other items with cigarette brand or logo	Yes No	0 50	0.0% 100.0%
f. Cigarette promotion in the mall	Yes No	0 50	0.0% 100.0%

The average number of cigarettes bought in the last purchase was about 10 sticks and the amount spent was about NPR 22. The patients spent about NPR 1455.6 per year on tobacco and its products which is about 3 percent of the annual per capita income (NPR 48095). (Table 7)

Table 7: Questions related to RAISE taxes on tobacco or amount of money spent tobacco and its products.

Variables	Average
Average number of cigarettes bought in the last purchase	9.6 sticks
Average amount of money spent on last tobacco purchase	NPR 1.7
Average amount of money spent on tobacco and its products per year	NPR 1455.6

Of the various direct costs, the maximum out-of-pocket expenditure was on investigations followed by self medication, consultation, hospital bed charges, travel costs, accommodation, other expenditures while returning and the least was on food products. Due to hospitalization, the patients themselves lost an average of $ 109 (1$ = NPR 100) and the indirect loss of income of accompanying persons was $ 23 approximately. (Table 8)

Table 8: Direct and indirect costs of health care due to single episode of hospitalization

Variables	Categories	Mean (NPR)	Mean USD)
AVERAGE DIRECT COSTS	On consultation fees on doctors	6927	69.27
	On traditional/Faith healers	0	0
	Other costs (self medication)	24389	243.89
	On Investigations	25350	253.50
	On hospital (bed) charges	3458	34.58
	Travel costs (self and accompanying person)	2105	21.05
	Food/Snacks during travel (including accompanying persons)	245	2.45
	Accommodation of patient and accompanying persons during travel	1952	19.52
	Amount that will be spent while going home (travel, food and accommodation)	1584	15.84
AVERAGE INDIRECT COSTS	Loss of patient earnings due to illness	10912	109.12
	Loss of income of accompanying persons	2320	23.20

The productivity loss of patients on average was 10 days, the educational loss for children due to parent's illness was less than a week and the other accompanying persons lost their daily wages for about a week. After the treatment, the patients said they would take rest and not pursue work for about a month. More than one tenth (16.0%), lost their jobs due to illness and majority (90.0%) of them spent all the money they brought on hospital expenses. About half (46.0%) of patients had to take loans on interest for payment of hospital expenses,

12 per cent of them requested for payment transfers from loved ones and about 10 per cent even had to sell their assets. More than half of the patients felt that BPKIHS was an expensive hospital and a staggering 40 percent had experienced catastrophic health care expenditure. (Table 9)

Table 9: Financial burden due to health care expenditure among smokers

Variables	Categories	Frequency	Percent
Patient's working days lost due to illness (median ± IQR) = 10, (7 – 30) days			
Loss of children school/college days due to parent's illness (mean ± sd) = 5.75 ± 1.26 days			
Working day loss of accompanying persons (median ± IQR) = 7 (6 – 10) days			
Average number of days the patient will not go for work (median ± IQR) = 30 (15 - 47.5) days			
Job loss due to illness	Yes	08	16.0%
	No	42	84.0%
Was all the money spent brought spent on hospital expenses	Yes	45	90.0%
	No	05	10.0%
Methods of management of hospital expenditure (multiple responses)	Selling assets	05	10.0%
	Taking loans on interest	23	46.0%
	Use of savings	37	74.0%
	Transfer payments from friends/ relatives/ neighbors	06	12.0%
Affordability of hospital services of BPKIHS	Cheap	0	0.0%
	Affordable	22	44.0%
	Expensive	28	56.0%
Catastrophic expenditure (> 40 % of non-food household expenditure spent on health care)	Present	20	40.0%
	Absent	30	60.0%

On an average, the patients spent $ 572.15 on single episode of hospitalization in a tertiary care center of eastern Nepal. The average annual per capita income of the respondents was about $ 90 less than the cost of hospitalization. The indirect costs constituted a considerable (07.88%) percentage of the total out-of-pocket expenditure on health care. (Table 10)

Table 10: Total costs of single episode of hospitalization in a tertiary center on eastern Nepal.

Costs	In Nepalese Currency (NPR)	In USD (1USD=100NPR)
Average annual per capita income	48095	480.95
Average Out-of-pocket expenditure on hospitalization	57215.4	572.15
Average direct costs on hospitalization	52708.6 (92.12%)	527.08
Average indirect costs on hospitalization	5633.5 (07.88%)	56.33

DISCUSSION

In the current study, it was seen that the average length of the hospital stay for tobacco users in the study was around 9 days which is almost double compared to a study done in medicine in-patient department of a teaching hospital in Nepal.[10] More than one fourth, (28.0%) of the patients were current daily smokers which is similar to the national prevalence of adult daily smoking.[11] Manufactured and hand rolled cigarettes were the two most commonly used smoked tobacco products by the study respondents as stated in the country profile of Nepal.[13] In matter of smokeless tobacco use, 22 % were using it daily which is low compared to the national average for men (37.9%) and high when compared to women (6.0%).[12]

Among the current smokers, more than two thirds (73.3%) had tried to stop smoking in last one year which is high compared to study done in Kathmandu where 55% of the current tobacco users had tried to quit at least for once.[13] Of the total current smokers, 60 % had visited a health care provider in last 12 months and only 53.3 per cent were advised to quit smoking tobacco which needs to be improved as evidence suggests that contemplation or preparation stage of quitting tobacco rates are significantly higher among those tobacco users whose physicians have asked about their smoking status during clinical interaction.[14]

Regarding advertising, the patients of the current study noticed warnings about hazards of smoking cigarettes in newspapers and television. However, the current smokers did not notice health warnings on cigarette packages in last 30 days which could have ultimately led to quitting of the smoking habit. This reason probably may be due to the fact that National directive has increased coverage from 75% to 90% on health warnings only recently [15] and secondly it can also be attributed to the trend of smokers to buy loose cigarettes and not the

whole packet.

The patients spent about NPR 1455.6 per year on tobacco and its products which is about 3% of their annual per capita income which is NPR 48095. The association of smoking with reduced spending for other goods, such as food, education, healthcare and other necessities has been shown in studies using data from several individual countries: India,[16] China,[17] Cambodia [18]and Taiwan.[19] In the present study, an average of $572.15 which is $92 more than annual per capita income ($480.95) of the patients was spent on single episode of hospitalization which could easily drive them to poverty. The analysis of various Nepal Living Standard Survey (NLSS) showed that the average per capita OOP spending on health in Nepal has increased sevenfold between 1985 - 1996 and 2010 -11, and currently stands at NPR 3278. Another point was that OOP share is higher for rural areas than for the urban areas and among the three belts of Nepal, it was highest for the Terai belt where BPKIHS (study location) is located.[20] Also, there is scientific evidence from the developing countries like Nepal which suggests that household health spending is a major cause of poverty.[21]

In the present study, most of the expenditure was due to direct costs of investigations, self medication, consultations, hospital bed charges, travel costs, accommodation and food expenses. Studies from other S E Asian countries like India and Bangladesh show that smoking generates a negative economic impact through direct medical costs of tobacco-related morbidity, disability, hospitalizations and medical consultation fees.[22-23] Along with it, contribution of indirect costs to the expenditure was about eight percent in the current study. The productivity losses of patients on average was 10 days, the educational losses for children due to parent's illness was less than a week and the other accompanying persons lost their daily wages for about a week. More than one tenth (16.0%), lost their jobs due to illness. This mechanism of indirect costs due to lost productivity from smoking-related illnesses and disability at the individual level, which can also reduce tax revenues and ultimately impact national economic growth has been highlighted by various studies.[24-25]

A staggering 40 percent had experienced catastrophic health care expenditure which is evident by the fact that about half (46.0%) of patients had to take loans for payment of hospital expenses, 12 per cent of them requested for payment transfers from loved ones and about 10 per cent even had to sell their assets. A study from Africa concluded that even at very low levels of health care utilization and modest amount of health expenditure, 6-15% of total households in incurred catastrophic expenditure and poorest members of the community incurred catastrophic health expenses.[26] Evidence from 14 countries of Asia revealed that Nepal is one of the countries along with Bangladesh, China, India and Vietnam which rely most heavily on OOP financing and have the highest incidence of catastrophic payments.[3] Contrasting results came from a Vietnamese study which found that incidence and intensity of catastrophic payments- both in terms of pre-payment income as well as ability to pay were reduced between 1993 and 1998, and that both incidence and intensity of 'catastrophe' became less concentrated among the poor.[27]

The study has various limitations. Firstly, a scientific basis for sample size calculation was not used due to limitation of time and thus, tobacco users who gave consent became study participants. Secondly, a non-probability sampling technique was used, thus external validity of the study findings is limited. Lastly, there were chances of socially desirable responses from the patients as at the day of discharge all the patients were counseled not to start or continue tobacco consumption.

The study shows that a high percentage of families undergo catastrophic health expenditure makes them impoverished. Furthermore, tobacco users had previous history of hospitalization which pushes them towards poverty. Also, indirect costs due to productivity losses and opportunity cost attached to a single episode of hospitalization are noteworthy. Thus, the patients should adopt health financing schemes which will protect them from financial risks due to health care expenditure in the future. Along with awareness programs to highlight economic ill effects of tobacco consumption national policies of Nepal should also emphasize on opportunity and indirect costs that are attached to a hospitalized smokers which produces additional burden on household income.

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