A cross-sectional study to identify the factors associated with utilisation of healthcare for non-communicable diseases in a southern part of India

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Abstract

Background: In India, non-communicable diseases (NCDs) are a serious threat to human resources, as the recent data suggests that one in four Indians are at a risk of dying of NCDs before they reach 70 years of age. Healthcare utilisation is a major policy issue to tackle the threat of non-communicable diseases.

Objective: The aim of this study was to identify the factors and build a regression model that shows how the various factors affect health care service utilisation for non-communicable diseases across rural and urban households of Udupi taluk, Karnataka.

Materials and Methods: A cross-sectional study was done to study the objective. Two-stage cluster sampling technique was used in both rural and urban areas. Thirty villages and 30 urban wards of Udupi taluk were selected by the probability proportional to size (PPS) technique.

Result: On univariate analysis, the factors found to be significant (p-value < 0.05) were the residence; health insurance; health care provider preference; income; education; waiting time; and distance to the health centre. To adjust for confounders, a multivariable analysis was done with binomial logistic regression which found that health insurance and distance to the health centre were the significant factors that affect outpatient health care utilization for NCD patients in Udupi taluk.

Conclusion: The results of this study show that it is important to concentrate on health insurance for access to health care for chronic diseases and strengthen the primary health care system. The main focus should be on insuring the vulnerable population and concentrate on the primary care of NCDs treatment.

KEYWORDS: Chronic diseases, health care financing, health insurance, healthcare utilisation

Introduction

Non-communicable diseases (NCDs) are called as chronic diseases as their duration is long and are quite slow to progress. NCDs were the leading cause of death worldwide in 2012. The 4 main NCDs viz. cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes account for majority of the deaths (38 million). About 82% (28 million) of these deaths happened in low and middle income countries (LMIC), including India. The recent data on non-communicable diseases shows that 60% of deaths in India are due to NCDs. Cardiovascular diseases alone contribute 26% of all deaths while chronic respiratory diseases, cancers, and diabetes contributes 13, 7, and 2% of all deaths, respectively.[1] The 2013–2020 WHO global NCD action plan has a vision of a world which is free of avoidable burden of NCDs. Hence, for the burgeoning problem of NCDs it is imperative that in developing countries, healthcare utilisation is explored as a public health policy issue.[2]

The present study aimed to examine the various factors affecting healthcare utilisation for non-communicable diseases among the rural and urban households of Udupi taluk, Karnataka. Udupi district is considered to be one of the well performing districts of India in terms of health and literacy.[3] However, as no study on NCD healthcare utilisation and its factors have been done previously in this area, the present study intended to add to the evidence in this regard.

Materials and Methods

Study design

A cross sectional study was conducted among households of villages and wards of Udupi taluk in the southern state of Karnataka, India. The study period was from February to July 2015.

Sample size calculation and sampling technique

A sample size of 405 households was reached using 95% confidence interval; health utilization rate of 0.8; design effect of 1.5 and non-response rate of 10%.

A two-stage cluster sampling technique was used for data collection. In urban areas, wards and in rural areas, villages were considered as the clusters or primary sampling units (PSU), respectively. PSUs were randomly selected from both rural and urban areas by a systematic random sampling with probability proportionate to size (PPS). Households or secondary sampling units (SSU) were selected in the next stage by simple random sampling from each of the selected PSU. Further, seven households were selected from each cluster to reach the sample size. Only those households which had an adult member (above 18 years of age at the time of data collection) and affected with any of the 4 main non-communicable diseases were included as participants.

A validated survey questionnaire obtained from the 60th round of NSSO (January–June 2004) was modified according to the present objective. It was piloted in 10 households of Udupi to check the feasibility and modified as necessary. The questionnaire was in English and the local language (Kannada). Institutional ethical clearance was obtained prior to commencement of the study and written informed consent was sought from participants before conducting an interview.

Variables

The dependent variable was outpatient healthcare utilization (dichotomous). Independent variables were derived according to Andersen[4] healthcare utilization model. This model provides a framework to analyse utilisation of healthcare according to three domains: predisposing factors, enabling factors, and need characteristics.

The predisposing factors were age, gender, and marital status while the enabling factors included residence, insurance status, provider preference, income, education level, waiting time, and distance to the health centre. The need characteristics included perceived health status and number of household members with non-communicable diseases.

Data analysis

Univariate and multivariable analysis were conducted with SPSS version 15.

Result

Of the total 405 households, 397 household respondents participated in the study with a response rate of 98.02%. Table 1 shows that the self-reported morbidity of the respondents was highest for cardiovascular diseases (46.1%), followed by diabetes (21.7%) and multi-morbidity (16.6%). Apart from cancer, the distribution was fairly similar for all the other categories. Rural households had twice the number (5%) of cancer morbidity than urban areas (2.6%). For seeking treatment, about 6% of the respondents preferred private health care (Table 2). The preference is more in urban (62.2%) than in rural areas (57.7%).

Table 3 is about the finances for their treatment where more than half the respondents (55.2%) revealed that they were insured. But the proportion of respondents who are not insured is quite significant (45%). Private insurance dominated the insurance schemes (26%), followed by those with their employer provided medical insurance (14%). Even though 55 % households had health insurance, only 13.6% of them utilized their health insurance exclusively to get access to health care.

Table 1: Self-Reported Morbidity of Non-communicable diseases

Self-reported NCD	Rural *N* (%)	Urban *N* (%)	Total *N* (%)
CVD	91 (45.3)	92 (46.9)	183 (46.1)
Diabetes	43 (21.4)	43 (21.9)	86 (21.7)
CRD	25 (12.4)	22 (11.2)	47 (11.8)
Cancer	10 (5.0)	5 (2.6)	15 (3.8)
Multimorbidity	32 (15.9)	34 (17.3)	66 (16.6)

Table 2: Treatment seeking behaviour

Healthcare providers preferred	Rural *N* (%)	Urban *N* (%)	Total *N* (%)
Government	85 (42.3)	74 (37.8)	159 (40.1)
Private	116 (57.7)	122 (62.2)	238 (59.9)

Table 3: Household's financing mechanism for healthcare use in the past 12 months

Expenditure by	Rural *N* (%)	Urban *N* (%)	Total *N* (%)
Insurance	24 (11.9)	30 (15.3)	54 (13.6)
OOPE			
a. Only OOPE	130 (64.7)	127 (64.8)	257 (64.7)
b. Both OOPE and Insurance	47 (23.4)	39 (19.9)	86 (21.7)
Total	177 (88.1)	166 (84.7)	343 (86.4)

OOPE = out of pocket expenditure

Table 4 reveals that out of pocket expenditure (OOPE) constituted a huge 86.4% of the health care costs in the last 12 months.

Household income and savings contributed the majority of the OOPE (57.1%) while friends and relatives pooled in with contribution in 17.8% cases. A few households (9.8%) borrowed money as loan to pay for NCDs treatment.

Table 4: Distribution of out of pocket expenditure (OOPE)

Breakdown of OOPE	N (%)
Household Income/Savings	227 (57.1)
Loan with interest	39 (9.8)
Contribution by friends/relatives	71 (17.8)
Other sources	6 (1.5)
Total	343 (86.4)

To identify the factors having significant association with outpatient healthcare utilization univariable logistic regression was conducted (Table 5). Then it was fitted into a model with multivariable analysis by binomial logistic regression to find the predictors of outpatient healthcare utilization. The results were reported as adjusted odds ratio at 95% confidence interval. The equation that depicts the connection between the dependent variable and the independent variables (or predictors) in logistic regression is

Log (odds of out-patient health care utilisation = 1) = $a + b_1X_1 + b_2X_2 + \ldots + b_nX_n$

Selection of Final Model

The presence of interaction between the two significant factors (health insurance and distance to the health centre) and its impact on the final outcome were tested. Then, for fitting the final multivariable models, we selected the

Table 5: Regression analysis

Variable	Unadjusted OR with 95% CI	Adjusted OR with 95% CI	*p*-value
Age	1.01 (0.98–1.02)	1.02 (0.98–1.03)	0.55
Gender			
Male	1.06 (0.66–1.69)	1.24 (0.71–2.15)	0.44
Female			
Residence			
Urban	1.60 (1.01–2.54)	1.13 (0.65–1.97)	0.699
Rural			
Health Insurance			
Insured	7.14 (4.20–12.14)	4.49 (2.36–8.53)	0.001*
Not insured			
Health care Provider Preference			
Private	2.91 (1.83–4.63)	1.55 (0.88–2.72)	0.147
Government			
Income per month(INR)			
≥36017	23.0 (2.47–213.70)	4.96 (0.38–63.51)	0.21
18000-36016	23.5 (4.23–131.40)	8.02 (1.10–58.54)	0.04
13495-17999	4.15 (1.38–12.40)	2.16 (0.52–8.88)	0.28
8989-13494	2.58 (0.87–7.66)	1.48 (0.38–5.74)	0.57
5387-8988	1.90 (0.63–5.77)	1.61 (0.43–6.01)	0.47
1803-5386	1.29 (0.42–3.94)	1.45 (0.41–5.1)	0.55
≤1802			
Education			
Graduate/Post graduate	4.78 (1.83–12.49)	0.95 (0.26–3.50)	0.94
Intermediate	4.10 (1.42–11.85)	1.41(0.37–5.3)	0.60
High School			
Middle School	2.21 (0.93–5.20)	1.02 (0.33–3.0)	0.97
Primary School	1.78 (0.78–4.05)	1.56 (0.58–4.19)	0.37
Illiterate	1.23 (0.52–2.95)	1.86 (0.66–5.18)	0.23
Waiting Time			
Short	2.40 (1.385–4.185)	1.55 (0.60–2.93)	0.17
Long			
Distance to Health Centre			
≤10 km	3.14 (1.93–5.11)	2.48 (1.41–4.36)	0.002*
>10 km			

Table 6: Regression model selection

Model	Variables	LR chi2 (d.f)	Test statistic (comparing to model1)	*p*-value	AIC
1.	Age + Health insurance + Distance to health centre	78.69 (6)	--	--	632.28
2.	Age + Health Insurance + Distance to Health Centre + Healthcare provider preference	78.87 (7)	0.18	0.67	634.10
3.	Age + Health Insurance + Waiting Time + Distance to Health Centre + Health care provider preference	79.78 (10)	1.09	0.89	639.18
4.	Age + Health Insurance + Waiting Time + Distance to Health Centre + Health care provider preference	79.95 (11)	1.26	0.93	641.02
5.	Age + Health insurance + Distance to health centre +Health Insurance *Distance to health centre	56.77 (8)	6.33	0.04	629.95

relevant variables from the univariable analysis which have a Hosmer Lemeshow *p*-value of less than 0.25. Many researchers believe that the usual *p*-values like 0.05 fail to take into account many important covariates in logistic regression and hence recommend the usage of *p*-value of 0.25.[5,6] For the final model, we did the analysis after adjusting for age as age and NCDs are correlated. The fit of different models by likelihood ratio tests and also by Akaike information criteria (AIC) were compared. Then by parsimony principle, the final model has been selected, which means that if two models were approximately similar then the simpler model with fewer parameters was selected. Based on these criteria, model 5 which included age, health insurance and distance to the health centre (with interaction between the latter two) was selected as the final model to predict outpatient healthcare utilisation in Udupi taluk, India.

Discussion

The present study found that in Udupi taluk, for NCDs, self-reported morbidity was highest for cardiovascular diseases. A finding consistent with that of the fourth district level household and family survey (DLHS-4), which reported that the prevalence of cardiovascular diseases was the highest in Udupi at 34%. Although the DLHS-4 data placed the prevalence of diabetes (15.5%) below respiratory diseases (28.1%); this study observed self-reported morbidity of diabetes and multi-morbidity to be more than chronic respiratory diseases and cancer, respectively.[7] However, this could be attributed to the differences in definition of chronic respiratory diseases used in both the studies. Nonetheless, this was consistent with the absolute number of cases in India as per the World Health Organisation report of 2011, which stated that India has 62.4 million diabetic patients, much higher than the 30

million chronic respiratory diseases and 0.95 million incidents of cancer cases.[8] Another significant finding of this study was the presence of multi-morbidity in about 17% of the respondents. A study done by Pati et al.[9] in 2014 found that 8.9% of the Indian adult population had multi-morbidity with the presence of two or more NCDs.

Financing for health care is a major issue in India with 80% of health care provided by the private sector. This study found that the health care preference for private hospitals is much lower than the national average at 60%. This can be attributed to the better government health facilities in Udupi taluk. Despite that however, the actual visits to government facilities (PHC/CHC/District Hospitals) is only 25%; similar to the findings of a study done by the Ministry of Health and Family Welfare (MOHFW) of India in 2005, which observed that government facilities provide only 30% of the health care services in the country.[10] More significance could be attributed with the observation that financing for NCD treatment is still mainly done by out of pocket expenses, a trend also observed by the present study, which found that the overall out of pocket expenditure in Udupi taluk for NCDs treatment is 86.4% (*N*=343) which is exactly similar to the national average of 86%. The major chunk of out of pocket expenditure was by household income and savings (57.1%) while contribution by friends and relatives came next with 17.8%. This was consistent with the findings of Engelgau et al.[11] who analyzed 2004 NSSO data and found that OOPE for NCDs was mainly financed by household income and savings (45.1%) and by friends and relatives (10–15%).

About 55% of the respondents said that they had some form of health insurance cover. This was significantly high when compared to the other parts of the country. A study done by Selvaraj et al.[12] revealed that the health insurance cover of the country is only 25%. This difference can be attributed to the target oriented schemes specific to Manipal University (Manipal Health Card) and community insurance

like 'Sampurna Suraksha'. However, the evidence that out of pocket expenses were still high with about 45% respondents lacking any form of health insurance indicates that there might be a gap in knowledge and information. A study done in 2010 by Kasturba Medical College and Hospital showed that around 62% inpatients had no knowledge about medical insurance. This reveals a need for improving the public knowledge about health insurance.[13]

The outpatient health care utilization for NCDs was 74.1%. Private health care was utilized by 82.8% patients in contrast to only 62.8% of public health care utilization. This is consistent with the findings of the NSSO 60th round. Additionally, this assumes significance because the MOHFW has a vertical NCD programme called National programme for prevention and control of cancer, diabetes, cardiovascular diseases and stroke (NPCDCS) and its success is paramount for tackling the burden of NCDs in India.[14] Greater emphases must be placed on better integration of this program with the public health facilities so that health care utilization increases in government health centres.

Regression analysis reveals that health insurance and distance to the health centre are the main two predictors for outpatient health care utilisation for NCDs in Udupi taluk (adjusted for age). In fact, this analysis showed that there is an interaction between the two predictors which may mean that people with health insurance tend to access health care nearby. Girma et al.[15] showed similar findings in a study done in 2007. A 2011 research paper of Thakur et al.[16] said that fee-for service makes it financially harder for people to access health care and so health insurance is a better option to increase utilisation rate.

Recommendations

The study reiterates the fact that for tackling the ever increasing burden of non-communicable diseases public health system must be strengthened. Primary level health care needs more importance for preventive care of non-communicable diseases. Finally, even for private health care, health insurance is a better way to increase utilization rate for NCDs treatment.

Conclusion

There was no significant difference in the need characteristics of the rural and urban areas for non-communicable diseases, with both actual and perceived needs of health care being similar across both these places. The predisposing factors like age, gender and marital status also did not show any significant association with healthcare utilization for NCD treatment. Further research is required to conclude if Udupi's high literacy rate is responsible for non-existence of inequities in utilisation of health care for chronic diseases in urban and rural areas.

However, certain enabling factors were found to influence access to health care treatment, irrespective of the socio-economic status of the patient. Health insurance and distance to the health centre were seen to be important factors, which influenced the decision to access outpatient healthcare to seek treatment. Self-medication was observed to be common, indicating a gap in information about the importance of getting early diagnosis and proper treatment for NCDs.

Acknowledgement

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