

Public Private Health Care Facility Utilization among Diabetic People in an Urban Area: A Descriptive Study

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ABSTRACT

INTRODUCTION: Diabetes was considered the disease of affluent and imposes a significant burden on the health services. The modalities of diabetes therapies are different in different parts of the world. However, studies regarding public or private healthcare utilization are lacking in Nepal. Therefore, this study was designed to assess public private health care facility utilization among diabetic people in an urban area of Itahari, Nepal. **MATERIALS AND METHODS:** A community based cross-sectional study was conducted in Itahari, Sub-metropolitan of Sunsari district in the Koshi zone of Nepal from September 2017 - September 2018. The study population included 221 participants of age 25 years and above, diagnosed with type 2 Diabetes. Multi-stage proportionate random sampling method was adopted to select the participants. Chi square test was applied to find out the association and $p < 0.05$ is considered significant. **RESULTS:** Out of the total (221) participants, 55.7% were aged 45-64 years with male of 50.2%. Higher proportion of participants above poverty line (79.7%) were used private healthcare facilities. Among the participants those reported less or equal to two hours waiting time, majority (90.8%) had gone to private healthcare facilities, whereas those reported more than two hours waiting time, majority (70.8%) had gone to public healthcare facilities for the treatment which was found statistically significant ($p = 0.0002$). **CONCLUSIONS:** Maximum participants prefer private health care services as compared to government health services for their treatment. Therefore, additional community based studies are needed to include larger study populations in order to help healthcare providers develop proper health care programs for these patients.

Keywords: Diabetes, Public Private, Healthcare, Utilization.

INTRODUCTION

Diabetes mellitus is a public health problem with serious medical and economic consequences. Urbanization has driven dramatic changes in lifestyle and in particular in developing countries. With these rapid transitions come accompanying increases in risk factors for non-communicable diseases like type 2 diabetes [1]. Diabetes mellitus is now emerging as a global epidemic. The problem is growing so rapidly that it is projected to be the seventh leading cause of death by 2030 [2]. The escalating burden of diabetes has already surfaced in low and middle income countries (LMICs) where four out of five people with diabetes are currently living [2]. Diabetes prevalence has been rising more rapidly in low and middle income countries. In South-east Asia, it is estimated that 75 million people are living with diabetes and this figure will rise 123 million by 2035. It has a prevalence of 8.3%

and more than 1.1 million people die annually in the region from the disorder. There were 700,700 cases of diabetes in Nepal in 2014. Prevalence of diabetes in adult in Nepal in 2014 for age group (20-79 years) was 4.6 % with more than 14,778 deaths that year [3]. Hypertension and abnormalities of lipoprotein metabolism are often found in people with diabetes. There is lack of public awareness regarding DM in Nepal where, medical services are poor. Diabetes was considered the disease of affluent, however there is paradoxical shift in low socioeconomic communities. Diabetes imposes a significant burden on the health services. Many patients especially those patients who are affected with chronic diseases such as diabetes are depending upon traditional, complementary and alternative medicines either alone or in combination with conventional medicines because of its

perceived safety, efficacy and low cost. The modalities of such therapies are different in different parts of the world. However, studies regarding public or private healthcare utilization are lacking in Nepal. Most of the studies in Nepal and foreign countries were modern medicine hospital based which were not representative of the diabetes population in the community. So there is a need for a comprehensive community based study to determine the correlates of patients who are using public or private healthcare. Thus, this study was designed to assess public private health care facility utilization among diabetic people in an urban area of Itahari, Nepal.

MATERIALS AND METHODS

Study design and setting

This A community based cross-sectional study was conducted in Itahari, Sub-metropolitan of Sunsari district in the Koshi zone of Nepal from September 2017 - September 2018. It is located at the main transportation junction of Eastern Nepal. It is the center of the east-west highway and south-north Koshi highway and thus is a town of emerging importance. Itahari consist of 20 wards. According to the census 2011, it had 33794 households and 140517 total populations. Out of which 66566 are male and 73951 are female. Itahari Primary Health Centre (PHC) is situated in ward number 8 of Itahari sub-metropolitan city [4].

Participants, sample size and sampling technique

Isolation Two hundred twenty one diagnosed cases of type II diabetes mellitus residing in the study area aged 18 years and above were considered for this study. Sample size of 221 individuals were enrolled in this study by taking the reference of the prevalence of use of antidiabetic medicine i.e. 45.84% a study done by Upadhyaya et al. [5]. The sample size considered 95% CI and 85% power to estimate the sample size by using the universal formula $(n) = z^2pq/L^2$ by considering L as 15% of P at 85% power equals 6.88 and 10% of dropouts. Multi-stage proportionate random sampling method was adopted to select the participants. Acutely ill patient with mental illness, incapable of providing relevant information were excluded from the study.

Data collection procedure and study variables

Semi structured questionnaire containing socio-demographic and clinical questionnaire was used for the study. Fasting blood sugar was measured using a portable glucometer (BestCheck basic). Blood pressure was measured as per the standard guidelines using a calibrated aneroid sphygmomanometer after 15 minutes or more rest. Blood pressure was measured twice at 5 minute interval. Age, Sex, Marital status, ethnicity, education, occupation, and poverty were considered as independent variables.

Statistical analysis and data management

Collected data were entered in Microsoft Excel 2007 and after cleaning the data, it was converted into Statistical Package for Social Sciences (SPSS) 11.5 version for statistical analysis. Frequency and percentage were calculated. Chi square test was applied to find out the association between private or public healthcare facility utilization and $p < 0.05$ is considered significant.

Ethical considerations

This study was approved by the Institutional Review Committee (IRC) of BPKIHS, Dharan. (Ref. No.303/074/075) and the approval was also obtained from Nepal Health Research Council (NHRC) (Ref. No. 773).

RESULTS

Table 1 shows the demographic characteristics of the type 2 diabetes patients. Among 221 participants, more than half (55.7%) of them belonged to the age group of 45-64 years, followed by 29.9% in the age group of ≥ 65 years and 14.5% in the age group of 25-45 years.

The proportion of the male and female participants were almost equal i.e. 50.2% and 49.8% respectively. Among which 90.5% of the participants were married. More than half of the participants (54.3%) belonged to Brahmin/Chhetri ethnicity followed by Janajati (32.1%) and few were dalit or muslim (6.8%). Most of the participants (53.4%) were literate. Regarding the occupation, 32.1% were house maker, followed by Clerical/ shop owner/ farmer (24.9%), unemployed (18.1%), migrants (10%), skilled workers (4.1%) and semi-skilled (1.4%). The Participant involved in professional, semi-professional and unskilled were equal (3.2%). Most of the participants (71.0%) were below poverty line.

Table 1| Demographic profile of participants (n=221)

Characteristics	Frequency	Percentage
Age		
25-44 years	32	14.5
45-64 years	123	55.7
≥65 years	66	29.9
Gender		
Male	111	50.2
Female	110	49.8
Marital Status		
Married	200	90.5
Widow	21	9.5
Ethnicity		
Brahmin/Chhetri	120	54.3
Janajati	71	32.1
Madheshi	15	6.8
Others (Dalit, muslim)	15	6.8

Table 1| Continued...

Education Status		
Literate	118	53.4
Illiterate	103	46.6
Occupation		
Professional	7	3.2
Semi-professional	7	3.2
Clerical, shop, farmer	55	24.9
Skilled worker	9	4.1
Semi-skilled	3	1.4
Unskilled	7	3.2
Unemployed	40	18.1
Housewife	71	32.1
Others(migrants)	22	10.0
Poverty line		
<1.9\$/person/day	157	71.0
≥1.9\$/person/day	64	29.0

Blood pressure measurement among the participants showed 54.3% of hypertensive patients and pre-hypertension was 31.2% among the participants. Regarding fasting capillary blood

the participants nearest health facility was public one. Majority of the participants (77.4%) had waiting time for the doctor visit after reaching the health center was less than 1 hour (Table 2).

Table 2| Blood Pressure and others status of participants (n= 221)

Characteristics	Frequency	Percentage
Hypertension status		
Normotensive	32	14.5
Pre-Hypertensive	69	31.2
Hypertensive	120	54.3
Fasting capillary blood sugar		
<110mg/dl	21	9.5
≥110mg/dl	200	90.5
Time to reach health facility		
<30minutes	199	90.0
≥30minutes	22	10.0
Nearest health facility		
Public hospital	70	31.6
Private clinic/hospital	151	68.4
Waiting time		
<1 hours	171	77.4
1-2 hours	2	0.9

sugar (FCBS) level, more than two third (90.5%) of participants had 110gm/dl and above fasting capillary blood sugar. We found that 90% of the participants have to walk for the nearest health facility for less than 30 minutes. For majority of the participants (68.4%) nearest health facility was private health center, meanwhile for only 31.6% of

Table 3| Association of socio-demographic characters and types of healthcare facilities utilizations (n=221)

socio-demographic characters	Utilization of health care facility		P-value
	Public n (%)	Private n (%)	
Age category			
25-44 years	8(25.0)	24(75.0)	0.270
45-64 years	23(18.7)	100(81.3)	
≥65 years	19(28.8)	47(71.2)	
Gender			
Male	28(25.2)	83(74.8)	0.353
Female	22(20.0)	88(80.0)	
Marital status			
Married	45(22.5)	155(77.5)	0.891
Widow	5(23.8)	16(76.2)	
Ethnicity			
Brahmin/chhetri	24(20.0)	96(80.0)	0.309
Other caste	26(25.7)	75(74.3)	
Education			
Illiterate	20(19.4)	83(80.6)	0.287
literate	30(25.4)	88(74.6)	
Occupation			
Earning	21(19.1)	89(80.9)	0.221
Not earning	29(26.1)	82(73.9)	
Poverty line			
<1.9\$/person/day	37(23.6)	120(76.4)	0.600
≥1.9\$/person/day	13(20.3)	51(79.7)	

Table 4 Association of co-morbid condition and types of healthcare facilities utilizations (n=221)

Morbid condition	Utilization of health care facility			P-value
	Public n (%)	Private n (%)	Total n (%)	
HTN Status				
Normal	10(31.3)	22(68.8)	32	0.290
Pre-HTN	12(17.4)	57(82.6)	69	
HTN	28(23.3)	92(76.7)	120	
Fasting blood sugar level				
<110mg/dl	7(33.3)	14(66.7)	21	0.218
≥110mg/dl	43(21.5)	157(78.5)	200	

Association of public or private healthcare facility utilization among diabetic people with various socio-demographic characteristics is shown in Table 3. In this study, most participants of age group 45-64 years (81.3%) utilized private healthcare facilities for treatment of diabetes followed by age group 25-44 years (75%) and age group ≥65 years (71.2%) which was not found statistically significant. Slightly higher proportion of female (80%) utilized private healthcare facilities than male (74.8%). Gender was not found statistically significant with health care utilization. Regarding marital status, slightly higher proportion of married (77.5%) utilized private healthcare facilities than widow (76.2%) which was not found statistically significant. Similarly, there was no significant association of ethnicity with healthcare utilization ($p>0.05$), however, higher proportion of Brahmin/chhetri (80%) were found to utilize private healthcare facilities than the other castes (74.3%) concluding that most of the participants was utilizing private health facilities.

Regarding education, slightly more illiterate participants (80.6%) than the literate participants (74.6%) had gone to private healthcare facilities in comparison to public healthcare facilities which was not found statistically significant ($p=0.287$). Even though there was not showing association, education play important role in any disease management. Similarly healthcare facility utilization was not statistically significant with occupation ($p=0.221$) and poverty line ($p=0.600$). However, higher proportion of those earning (80.9%) utilized private healthcare facilities than those not earning (73.9%) in comparison to public health facilities. In this study, higher proportion of

Table 5 Association of time to reach to nearest health facilities and waiting time with types of healthcare facilities utilizations (n=221)

Characteristics	Utilization of health care facility			
	Public n (%)	Private n (%)	Total n (%)	p-value
Time to reach health facility				
≥30 minutes	7(31.8)	15(68.2)	22(100)	0.277
<30 min	43(21.6)	156(78.4)	199(100)	
Waiting time				
≤2 hours	16(9.2)	157(90.8)	173	0.0002
>2 hours	34(70.8)	14(29.2)	48	

participants above poverty line (79.7%) were used private healthcare facilities than participant below the poverty line (76.4%) in comparison to public healthcare facilities. There were equal proportion of respondents visited public and private healthcare facilities for the treatment of all morbid condition like hypertension and diabetes. There were no significant association of hypertension status ($p=0.290$) and fasting blood sugar ($p=0.218$) with the types of healthcare facility utilization (Table 4).

Association of time to reach to nearest health facilities and waiting time with types of healthcare facilities utilizations are shown in Table 5. Participants who reported either ≥30 minutes or <30 minutes to reach health facilities, majority were availed private healthcare facilities in both the situations as 68.2% and 78.4% respectively. It was found that among the participants those reported less or equal to two hours waiting time, majority (90.8%) had gone to private healthcare facilities, whereas those reported more than two hours waiting time, majority (70.8%) had gone to public healthcare facilities for the treatment which was found statistically significant ($p=0.0002$)(Table 5).

DISCUSSION

As the prevalence of diabetes is increasing day by day, its associated complications, economic cost of treatment and various health care practice. In our study most of the participants (70.1%) are used private health system for treatment of diabetes rather than public hospital even the government increase health facilities in the peripheral level. Age is one of the most important risk factors for type 2 diabetes and the burden of the disease is very high

in older age groups. In this study, Among 221 participants, more than half (55.7%) of them belonged to the age group of 45-64 years, followed by 29.9% in the age group of ≥ 65 years and 14.5% in the age group of 25-45 years. The finding was similar with the study done in Koshi Zonal hospital, Biratnagar, Nepal. The highest numbers of respondent i.e. 58% were in the age group of 40-60 years, 26% of age group > 60 years and lowest number i.e. 16% was in the age group of 20-40 years [6]. Finding of this study is also similar to a study done in the USA, aged 65 or older, the prevalence of diagnosed diabetes in 2011 was 20% [7]. The similar finding with the study done in BPKIHS, Dharan, 58.9% of the participants belong to the age group of 41-60 years, followed by 61-80 years (27.4%) and 13.7% of age group 20-40 years [8]. This finding is comparable with the study done among the diabetic patients recruited from three refugees camps in the Gaza strip where, 58.4% of the study participants were in the age group of 40 -60 years followed by 24.9% of more than 60 years [9]. In contrast to our study a study done in Dhaka in 2017, Most of the diabetic participants were between age group of 26-45 years 54.4% [10] but in our study age group 25-44 years was only 14.5%. it may be due to small sample size in our study. This all finding contributes that with increase age diabetes risk also increases. This could be due to the reason that, with advancing years, the body gradually becomes less adapt at taking up and using glucose from the bloodstream leading people's body tissues become less sensitive to insulin. Male and female were almost equally participated in this study i.e. 50.2% and 49.8% respectively. This is comparable with the study done in Pakistan, where 51.70% were male and 48.30% were female [11]. This was also consistent with hospital based study done in Biratnagar, Nepal [6]. However, a study was done among patients with diabetes attending the outpatient department of National Ayurveda Research and Training Center (NARTC) in 2014. There were 66.7% male and 33.3% female [12]. This signifies equal participants in the community but male are seeking more health care. In our study majority of participants were married (90.5%) and 9.5% were widow. Similar finding were found in a study done in NARTC in 2014 where 97% of the participants were married [12]. The similar finding with the study done in BPKIHS, Dharan, majority of the participants (84.8%) were married and 11.5%

were widow [8]. A study done in outpatient department of BIRDEM hospital, a referral hospital in Dhaka, Bangladesh in diabetic patients in 2016, 86.1% of participant were married and 13.9% were unmarried but in our study there were not unmarried participant was found it may be due to small sample size [10]. Similar finding was found a study done in North West Ethiopia where was 79% married and 9.5% widow [13]. Regarding ethnicity, most of the participants were Brahmin/Chhetri (54.3%) and Janajati (32.1%) ethnicity .This finding was comparable with the study done in Nepal, 37.7 % were from Brahman ethnicity [14]. and also similar finding where Brahmin/chhetri were 49.7% and Janajati were 48.8% [15]. In our study more than half (53.4%) of the participants was literate and 46.6% was illiterate. A study done in Thyroid and Endocrinology center at Kathmandu metropolitan city of Nepal among diabetic Patients in 2014 where 18 % of the respondents were illiterate [14]. This result contrast with the finding of study in Sullia Taluk, Karnataka, India , where 9.5% were illiterate [16]. On socioeconomic characteristics, 49.77% of the participants were engaged in some form of productive activities while 50.23% had no any form of employment. This was comparable with the finding of study done in Nepal 64% was earning and 32% was not earning. Most of the participants (71%), in this study belongs below poverty line. This was contrast with the finding of cross sectional study conducted among diabetic patients in urban region of eastern Nepal; where, 77.4% participants were above poverty line [8]. Regarding fasting capillary blood sugar (FCBS) level, in our study more than two third (90.5%) of participants had poor (110gm/dl) glycemic control, a study done in southern Brazil, showed that 50.5% had poor glycemic control which was due to my blood sugar measured by glucometer [17]. A contrary of the our finding a study done at Dhulikhel Hospital, Kathmandu University Hospital, Dhulikhel where 50.50% patients who had uncontrolled FBG (>130 mg/dl) level in our study prevalence of uncontrolled blood sugar level was high it was due to our reference value for controlled blood sugar level less than 110mg/dl [18]. Many of the participants 54.3%, in this study were found to be hypertensive on measurement. This finding was in comparable with the hospital based study done in Riyadh, Saudi Arabia where 64.1% participants was hypertensive [19]. Hypertension was found to be

the most common comorbidity (47.5%) in this study. One of the study done in Manimal teaching Hospital, Pokhara, Nepal in 2006 where 70.62% of the participants were Hypertensive [5]. Treatment from private health sector was sought by 77.4% diabetic patients and from the public health facilities 22.6%. A contrary finding found in a study done at Jhapa is the eastern plain (Terai) district of Nepal where 68% respondents sought treatment from public health care facilities in the first instance [20]. It may be due to we consider only diabetic patients so participants went to public health facilities for diabetes management. A similar finding in a study done in Ilam district of Eastern Nepal where 79.3% participants used the private health facilities [21]. One of the study done in Mumbai India among urban slums found 81% participants seek treatment from private health sector [22]. This could be linked with dissatisfaction of public hospital services and also easy access to the private health center. In our study most participants of age group was 45-64 years 81.3%, age group 25-44 years 75% and age group ≥ 65 years were going to private hospital/clinic. In our study age, educational status, ethnicity was not associated with the health facilities. However, a study done in eastern plain (terai) district of Nepal where age, educational status and ethnicity appeared to be associated with health facilities [20]. Nearest health facilities and waiting time was significantly associated with the health care utilizations in bivariate analysis. A study was done in Ilam district of Eastern Nepal where Nearest health facilities are also associated with the health care utilizations [21]. Gender, marital status, occupation and poverty

index was not associated with health facilities. Similar finding was found in a study done in Nepal where gender, marital status, occupation also not associated with the health facilities [20]. Hypertension status and fasting blood sugar level were not associated with the healthcare facilities utilization. Being a self-reported data in study may lead to participants' underestimation or overestimation of use of healthcare facility and comorbidity, which may affect the study findings. In our study there was small number of sample size so it may not be generalize. The less studies for health care facilities and comorbidity using which would enable the scope of understanding of use of public and private healthcare facility for diabetic patients.

CONCLUSIONS

Maximum participants prefer private health care services as compared to government health services for their treatment. The study found significant association between healthcare facility utilizations for diabetes and waiting time at the health facility. Even though in our study there was not found significant association of various variable with healthcare facility utilization, majority of participants utilized private health facilities than public health facilities.

Therefore, additional community based studies are needed to include larger study populations in order to help healthcare providers develop proper health care programs for these patients. Health care professionals should emphasize the impact of the chronic illness on patients.

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Data Availability: Data will be available upon request to corresponding authors after valid reason.

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