

**KNOWLEDGE AND PERCEPTIONS ABOUT DIABETES  
IN THE COMMUNITY: A SURVEY AMONG INDIVIDUALS  
ATTENDING A DIABETES-SCREENING PROGRAMME  
IN POKHARA CITY, WESTERN NEPAL**

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**Summary**

Diabetes prevalence has been steadily increasing in Nepal. Information on the knowledge about diabetes in the community is lacking in western Nepal. The present study was carried out to assess the respondents' knowledge about diabetes and note the association, if any, of the knowledge with demographic characteristics. Individuals attending a diabetes screening and education programme on 11<sup>th</sup> January 2003 were interviewed using a questionnaire and their responses recorded. 180 of the 521 individuals attending the programme consented to be interviewed. 67 were diabetics while 66 had a diabetic family member. The calculated median knowledge score was 5 (maximum possible score 16). The median score was higher among male respondents, diabetics, and respondents with a diabetic family member. Knowledge about diabetes was low. The results will be helpful in designing diabetes education and awareness programmes. Further studies with a larger sample size are required.

**Keywords:** Attitude, Diabetes, perception.

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## **Introduction**

The number of individuals with diabetes has been estimated by the World Health Organization (WHO) to be 135 million in 1995 and is expected to rise to 300 million by 2025 [1]. It has been estimated that 20% of the current global diabetic population resides in the Southeast Asian region and the number is expected to reach 79.5 million by 2025 [2]. Diabetes prevalence in Nepal was 2.2% in the year 1995 and is expected to rise to 2.6% by 2025 [3,4]. Continuous rural-to-urban population shifts, changes in dietary habit, decreasing physical activity and increasing life expectancy may be responsible [5]. Diabetes imposes a heavy burden due to medical costs, hospitalization, and time lost from work [6].

Treatment is costly and burdensome and a serious problem in Nepal with its limited resources [5]. Diabetes is a life-long disease and requires self-awareness and commitment for effective control and management [7].

Diabetes, if untreated, leads to various complications such as neuropathy, nephropathy, retinopathy, hyperlipidemia, foot ulcers, infections etc [8]. These complications develop over a long period of time and adversely affect the quality of life of the patients.<sup>10</sup> However, studies have confirmed that the complications of diabetes can be reduced by strict control of blood glucose [9,10]. Strict glycemic control can be achieved only if the patient takes the medicines as instructed by the doctor. Moreover, management of diabetes not only depends upon drug therapy, but also on physical exercise, diet and other life style modifications [11]. Diabetes patients may be more vulnerable to non-adherence as they need to take drugs regularly and also most of the time they suffer from other concurrent illnesses.

In general, it is well understood that the management of chronic diseases is strongly linked to life style modifications. Prevention of and effective treatment for these diseases requires behavioral changes. For patients with chronic illness, home is the central site of managing illness and these patients also require more knowledge regarding their illness [12].

Nepal is a socially and economically backward country with poor literacy standards. Information regarding the knowledge and perceptions of diabetic patients and general population towards diabetes are lacking in western Nepal. Hence, the present study was carried out to:

- 1) Obtain basic demographic information regarding the respondents
- 2) Assess the respondents' knowledge and perceptions regarding diabetes and
- 3) Note the association, if any, of the knowledge and perceptions with demographic variables.

## **Materials and Methods**

**Respondents and data collection:** The Manipal Teaching Hospital (the hospital of the Manipal College of Medical Sciences) carried out a one-day diabetes screening and education programme in association with a youth club at Nadipur, Pokhara on 11<sup>th</sup> January 2003. Around 500 people attended the camp.

Previously briefed seventh semester medical students and one of the authors (NS) interviewed respondents who were willing to be interviewed during the programme. Informed written consent was obtained from the respondents. The questionnaire shown in Table 1 was used for the data collection. The interviewers talked to the respondents in Nepalese and recorded their responses on the questionnaire.

**Demographic details:** The age, sex, family structure, occupation and level of education of the respondents were recorded. The average monthly family income and attitude towards complementary medicine were noted. Information was collected on whether the respondent or a member of the household (family members staying together with the respondent) was suffering from diabetes. Whether the respondent had previously attended a diabetes-screening programme and the factors, which motivated him/her to attend the present screening programme, were noted.

**Knowledge score:** The respondents' knowledge and perceptions regarding diabetes were studied using a questionnaire consisting of 16 questions. The answers were scored as follows: 0 for no response, 1 for a correct answer and -1 for an incorrect answer. The maximum possible total score was 16. The total score was calculated for each respondent separately.

**Data analysis:** Descriptive statistics was used to analyze the demographic and personal characteristics of the respondents. The association between the demographic and personal characteristics and the total individual score was analyzed by the appropriate statistical tests depending on whether or not the total score was normally distributed. A p value of less than 0.05 was taken as statistically significant.

The total score was compared between diabetic and non-diabetic respondents and respondents with or without a family household member suffering from the disease. Individuals who were diabetic and had a diabetic family member were classified into a separate group and their score was compared with other respondents. The total score was compared between diabetic and non-diabetic respondents of different age groups and among different age groups of diabetic respondents.

## **Results**

One hundred and eighty persons out of the 521 (34.5%) attending the diabetes screening and education programme gave their consent to be interviewed and their responses were taken up for further analysis.

**Demographic information:** The demographic and personal characteristics of the respondents are shown in Table 2. Fifty-one respondents (28.3%) were between the ages of 15-30 years, 106 (58.9%) were between 30 to 60 years of age while 23 were above the age of 60 years. Forty-two respondents (23.3%) were illiterate, 37 (20.5%) had studied until class IV (primary school). The majority of respondents [143 (79.4%)] had a monthly family income greater than 3000 Nepalese rupees (1 US\$ = 74 Nepalese rupees).

The attitude of the respondents towards complementary medicine is shown in Table 2. Sixty-seven respondents (37.2%) were diabetic while 113 were either not diabetic or had not checked their blood sugar level. Sixty-six individuals (36.7%) had a household family member who was diabetic. Twenty-six respondents were both suffering from diabetes and had a household family member who was diabetic. With regard to the main factor, which motivated the respondent to attend the screening programme, 57

persons (31.7%) said that publicity by the organizing club as the reason while 37 (20.5%) attended as the programme was organized near their residence. Thirty-one individuals (17.2%) had come for a health check up, 28 (15.5%) were members of the organizing club while 19 respondents (10.5%) were motivated by health workers.

**Knowledge score and data analysis:** The total score was calculated for each individual respondent. The total score was not following a normal distribution. The median score was 5 and the inter-quartile range was also 5. The association of the total score with the demographic and personal characteristics was studied. Mann-Whitney U test was used for dichotomous variables and the Kruskal-Wallis test for the others. The association of the total score with the demographic characteristics is shown in Table 3. There was a significant association of the total score with the sex and occupation of the respondents. The score was higher among males, students and teachers. The diabetic patients had a significantly higher score compared to the non-diabetics. The respondents who were both diabetic and had a diabetic family member had a significantly higher score compared to those who were not diabetics or even if they were diabetics did not have a diabetic family member.

The knowledge score among diabetic and non-diabetic individuals in different age groups is shown in Table 4. In the age group of 30-60 years and greater than 60 years the diabetic respondents had a significantly higher score. There were no differences in the knowledge scores among different age groups of diabetics.

### **Discussion**

The past two decades have seen an explosive increase in the number of people diagnosed with diabetes. India in South Asia is the country with the largest number of diabetics in the world [1]. In urban Nepal diabetes prevalence was shown to be 14.6% in urban areas [3]. Among individuals older than 40 years the prevalence was 18.3% [3].

**About the study:** Mainly persons residing in Pokhara sub-metropolitan city attended the diabetes education and screening camp. However, information on the place of residence of the respondents was not recorded. The median knowledge score was low and the majority of the respondents were not aware of the symptoms of diabetes, the complications and management of the disease. In our study the median score was higher among male respondents. In a previous study, differences in attitudes towards diabetes were most evident between men and women with type 1 diabetes while no differences were found as regards type 2 diabetes [13]. We did not look at knowledge and perception specific to type 1 and type 2 diabetes in our study.

A study conducted in Tamil Nadu, India on diabetic patients' knowledge and beliefs regarding diabetes and their practices regarding diet, medication and self-monitoring revealed a large gap between knowledge and action and revealed a need for increased efforts towards patient education [14].

In our study the median score was higher among diabetics compared to non-diabetics. The score was higher among diabetic respondents with a diabetic family member compared to others. In an European study, the calculated 'knowledge index' was highest in Europeans, increased with increasing educational achievement and was lowest in non-diabetics without a family history of diabetes [15]. Information on the ethnic and caste composition of the respondents was not noted in the present study. No association

of the score with educational achievement was noted in our study. However, more educated individuals had higher median scores. In an American study age, years of schooling, duration of treatment and sex were among the independent determinants of the knowledge score [16]. In a study in Singapore, knowledge of diabetes was similar between diabetics and non-diabetics even though younger diabetics obtained higher scores [17].

A study in the United Kingdom (UK) among South Asians and Caucasians had shown a lower awareness of diabetes and its complications among South Asians [18]. The adherence to treatment was also less strict among South Asians. In Pakistan, a study had shown that the overall awareness about the risk of complications was satisfactory but misconceptions regarding diet, insulin and diabetes were quite common [19]. We did not investigate the adherence to treatment guidelines in the present study.

In contrast to an Indian study, our study had shown an association of occupation with the knowledge score. The Indian study had shown a positive impact of education on overall knowledge levels [20]. Among South Asians in the UK diabetes presents at a younger age and complications, especially cardiovascular and renal disease are more common [21,22]. Early screening for diabetes and effective interventions such as improving glycaemic control, early treatment of hypertension and correction of dyslipidemia appear to be especially important among South Asians [23]. The cornerstone of any intervention should be improved education of the community regarding a healthy lifestyle, improved diet, increased physical activity and prevention of obesity [24].

**Need for educational programmes:** Astha Nepal, a non-governmental organization (NGO) has designed a pilot intervention which aims to train local health care providers and involve NGOs, the local community, students and youth groups to increase diabetes awareness in the community [25]. Educational programmes in the Pokhara valley to sensitize people regarding the different aspects of diabetes and its prevention and management are required. The Drug Information Center (DIC) of our hospital runs a Medication Counseling Center (MCC) which provides counseling to the selected out patients regarding their disease, medications and lifestyle modifications. In this center the diabetes patients are also being provided counseling. The preliminary evaluation of the center concluded that the MCC can play a definite role in enhancing patients' understanding about medications and disease pattern, which in turn may improve patient compliance [26]. There is a huge scope for this center in providing counseling to the diabetes patients.

The Departments of Internal Medicine, Community Medicine, Hospital and Clinical Pharmacy, Pharmacology of our institution aim to have more diabetes screening and awareness programmes in the future. However, due to logistical and other reasons only two more diabetes screening and education programmes were organized in the two years following the data collection.

#### **Limitations of the study:**

Our study had a number of limitations. Only 34.5% of the 521 persons attending the diabetes-screening programme consented to be interviewed. The number of male respondents was less and the ethnic and caste groups of the respondents were not noted. The place of residence (urban or rural) was not noted. We had used a mixture of

questions requiring a simple yes or no response and those requiring factual information in the questionnaire. The number of diabetic patients and individuals with family members suffering from diabetes was low. The respondents were not selected randomly and information on the respondents' awareness regarding the management of diabetes was not noted.

### **Conclusions**

Further studies in the various wards of Pokhara sub-metropolitan city and the surrounding villages with a larger sample size are required. These studies may confirm or refute the low median score observed in our study. Studies on prevalence of diabetes and impaired glucose tolerance in the community are required and will be helpful when combined with the knowledge and perception data in planning diabetes education and awareness programmes.

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**Table 1: Questionnaire used to conduct the study**

**Knowledge and perception of diabetes in the community**

**Age:**

**Sex:** M/F

**Family structure:** Living alone/Nuclear/Joint      **Occupation:**

**Level of education:** Illiterate/Primary/Class X/Graduate/Postgraduate/Professional

**Average monthly family income** (Nepalese rupees): <1000/1000-3000/>3000

**Whether you are suffering from diabetes:** Yes/No or not checked

**Whether any household family member is suffering from diabetes:** Yes/No or not checked

**Have you attended a diabetes screening and education programme before:**

Yes/No

**What motivated you to attend this programme?**

**Knowledge and perception regarding diabetes:**

**What is diabetes?**

**How can you know that you are suffering from diabetes?**

**What is the test to confirm diabetes?**

**What do you know about insulin?**

**How is insulin taken? Oral/Injections**

**Do you know any side effects of insulin?**

**Exercise is helpful in diabetes: Yes/No**

**Diabetes affects mainly middle-aged people: Yes/No/Don't know**

**Diabetes can affect young children: Yes/No/Don't know**

**In diabetes sugar intake has to be reduced: Yes/No/Don't know**

**Fat intake has to be reduced in diabetes: Yes/No/Don't know**

**Can you name two medicines other than insulin used to treat diabetes?**

**Care of the foot is important in diabetes: Yes/No/Don't know**

**Diabetes increases the risk of having a heart attack: Yes/No/Don't know**

**What will you do if you find a diabetic patient lying unconscious by the roadside?**

**If properly treated a diabetic can lead a normal life: Yes/No/Don't know**

**Table 2: Demographic and personal characteristics of the respondents**

<b>Characteristic</b>	<b>Categories</b>	<b>Number of respondents (%)</b>
<b>Age (in years)</b>	15-30	51 (28.3)
	30-60	106 (58.9)
	> 60	23 (12.8)
<b>Sex</b>	Male	69 (38.3)
	Female	111 (61.7)
<b>Family structure</b>	Living alone	12 (6.7)
	Nuclear	80 (44.4)
	Joint	88 (48.9)
<b>Occupation</b>	Agriculture	11 (6.1)
	Housewife	55 (30.5)
	Business	51 (28.3)
	Labourer	14 (7.8)
	Teacher	9 (5)
	Student	16 (8.9)
	Health related	10 (5.5)
	Others	14 (7.9)
<b>Level of education</b>	Illiterate	42 (23.4)
	Primary school	37 (20.5)
	Class X	69 (38.3)
	Graduate	26 (14.4)
	Postgraduate	6 (3.4)
	Professional	0
<b>Average monthly family income (Nepalese rupees)</b>	<1000	0
	1000-3000	37 (20.5)
	>3000	143 (79.5)
<b>Whether you are suffering from diabetes</b>	Yes	67 (37.2)
	No/Not checked	113 (62.8)
<b>Whether a household member suffers from diabetes</b>	Yes	66 (37.2)
	No/Not checked	114 (63.3)
<b>Diabetic respondents who had a family member suffering from the disease</b>	Yes	26 ( )
	No	154 ( )
<b>Whether you had attended a screening programme previously</b>	Yes	45 (25)
	No	135 (75)

**Table 3: Relationship of total score with demographic and personal characteristics**

Characteristic		Total score Median (interquartile range)	P value
<b>Age</b>	15-30	5 (6)	0.111
	30-60	5 (6)	
	>60	4 (7)	
<b>Sex</b>	Male	5 (5)	0.022
	Female	4 (6)	
<b>Family Structure</b>	Living alone	6 (6.75)	0.452
	Nuclear	5 (5.75)	
	Joint	4 (5)	
<b>Occupation</b>	Agriculture	3 (8)	0.019
	Housewife	4 (6)	
	Business	3 (4)	
	Labourer	7 (4.25)	
	Teacher	6 (4)	
	Student	6.5 (7.5)	
	Health related	3.5 (7.5)	
	Others	5 (6)	
<b>Education Level</b>	Illiterate	4 (5.25)	0.487
	Primary	4 (7.5)	
	Class X	5 (7)	
	Graduate	6 (6)	
	Postgraduate	5.5 (2.5)	
<b>Family Income</b>	< 1000	0	0.817
	1000-3000	5 (7)	
	>3000	5 (5)	
<b>Diabetes Sufferer</b>	Yes	7 (7)	0.006
	No/Not checked	4 (5)	
<b>Household Members Suffering from Diabetes</b>	Yes	7 (6.5)	0.195
	No/Not checked	4.5 (5.75)	
<b>Diabetic respondents with a family member suffering from the disease</b>	Yes	7 (5.5)	0.019
	No	4 (5.25)	
<b>Attended screening Programmes Previously</b>	Yes	4.5 (6.5)	0.886
	No	5(5)	

**Table 4: Knowledge score among different age groups of diabetics and non-diabetics**

<b>Age groups</b>	<b>Diabetic</b>	<b>Non-diabetic</b>	<b>P-value</b>
<b>15-30</b>			
<b>Median score</b>	<b>5.5</b>	<b>4</b>	<b>0.464</b>
<b>Interquartile range</b>	<b>8.75</b>	<b>5.5</b>	
<b>30-60</b>			
<b>Median Score</b>	<b>7</b>	<b>4</b>	<b>0.041</b>
<b>Interquartile range</b>	<b>6</b>	<b>5</b>	
<b>&gt;60</b>			
<b>Median score</b>	<b>4</b>	<b>2</b>	<b>0.012</b>
<b>Interquartile range</b>	<b>5.5</b>	<b>4.5</b>	