

Research Article

Study on use of Indigenous herbal product by diabetic patient visiting diabetic centre in Nepal

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ABSTRACT

Background and Objectives: Diabetes Mellitus (DM) is a chronic disease worldwide. With increasing trends towards sedentary lifestyle, the prevalence of diabetes mellitus is increasing in urban region of Nepal too.

Material and Methods: A quantitative descriptive study was conducted for a period of two months. One-to-one structured interviews were taken to fill the structured questionnaire prepared after proper literature review from the patients attending a diabetic clinic in Lalitpur. The questionnaire includes the socio-demographic details, lifestyle and questionnaires related to patients' perception and use of herbal remedies/product. Relevant information was also obtained from the patient medical files. Statistical analysis was performed by using SPSS version 20.

Results: Out of total population about 30 % of people were using the indigenous product for their treatment along with allopathic medication. Among them, 17 were male and 14 were female. Various indigenous herbal products were used by the patients. Among them fenugreek, aloe Vera, bitter guard, bottle guard, black berry are the common one. The frequencies of using these products are in fig 4.4. The total percentage of patient using fenugreek is 42%, Aleo-Vera 35%, Bittergaurd 29% and very few participants were using Bottle guard, Neem, and Hibiscus and Guava leaf too.

Conclusion: Participants have good faith on use of indigenous herbal products and are using it. Fenugreeks, Aloe-Vera, Bittergourd, Neem, Bottle gourd, Hibiscus and Guava leaf are commonly used. But no consistent data regarding fixed dose or method of preparation of such product was found. So, further researches are needed to confirm the effectiveness of those indigenous products.

Key Words: Herbal Products, Indigenous product, Diabetes Mellitus

INTRODUCTION

The prevalence of chronic non - communicable diseases are increasing day by

day in most countries, and for several reasons this trends is likely to increase. The impact of chronic diseases on the lives of people is serious when measured in terms of loss of

life, disablement, family hardship and poverty and economic loss to the country. According to the International Diabetes Federation (IDF), diabetes is one of the most common non-communicable diseases globally. IDF in 2013, reported 382 million people were suffering from diabetes and this number is estimated to incline almost 592 million by 2035 [1]. While it is the fourth leading cause of death in most high-income countries, 80% of current cases occur in low-and-middle income countries [1].

Traditional medicines derived from medicinal plants are used by more than 60% of world populations [2]. Different populations have their indigenous knowledge and use their own indigenous product for treatment of different diseases and same is true for diabetic cases too. In spite of various anti-diabetic regimens in pharmaceuticals market, herbal formulations are preferred due to its lesser side effects and low cost [3]. Even some fruits, vegetables, their leaves, roots and seeds are being used for therapeutic purpose for diabetic. In this study an attempt has been made to report the use of Indigenous herbal product by diabetic patients, their perception about those products. The findings of this study may provide crucial baseline information that can be used in the planning and implementation of prevention, control and treatment strategies for T2DM in Nepal [4]. The aim of the study was to determine the perception and use of herbal remedies among patients with T2DM who attend diabetes clinics in Kathmandu diabetes and thyroid center, in Jawlakhel.

MATERIALS AND METHODS

A quantitative descriptive study was conducted in a Endocrinology clinic (Diabetic and thyroid Centre) in Laitpur for a period of

two months. Interviews were conducted at the center on weekdays after approval of the endocrinologist practitioner/specialist doctor of the centre. Participants attending the center who satisfied the inclusion criteria were approached and invited to participate in the study. Males and females attending the center who had been formally diagnosed with T2DM by a health care professional; were between 30 to 69 years old; and received dietary and lifestyle treatment, hypoglycemic tablets and/or insulin; and who gave written informed consent were inclusion criteria for the study. Informed consent was obtained from the participants. Participants were interviewed by the researcher after the nurse in charge had checked weight and blood pressure. One-to-one structured interviews were taken to fill the structured questionnaire prepared after proper literature review. The questionnaire includes the socio-demographic details, lifestyle and questionnaires related to patients' perception and use of herbal remedies/product. Relevant information was also obtained from the patient medical files. Statistical analysis was performed by the Department of Biostatistics and was generated by SPSS version 20. The research was approved by Institution Review Board of College of food and Dairy technology, Minbhawan, Kathmandu, Nepal.

RESULTS

The socio-demographic results of the total sample recorded according to gender, age, marital status, level of education, employment status, and income level are presented in Table 1. Most participants were females (55.2%). The mean age of the total group was 57.8 ± 10.1 years (56.6 ± 8.4 years for the females and 47.0 ± 11.8 years for the males).

Table 1: Socio-demographics of the participants (N=105)

Variables	FREQUENCY/PERCENTAGES					
	Total group (n=105)		Females (n=58)		Males (n=47)	
	n	%	n	%	n	%
Age						
30-39 years	6	5.7	1	1.7	5	10.6
40-49 years	13	12.3	9	15.5	4	8.5
50-59 years	34	32.3	23	39.6	11	23.4
60-69 years	39	37.1	23	39.6	16	34.0
70-80 years	13	12.3	2	3.4	1	23.4
Marital status						
Married	71	67.6	40	68.9	31	65.9
Single	7	6.6	2	3.4	5	10.6
Divorced	2	1.9	1	1.7	1	2.1
Separated	1	0.9	1	1.7	0	0.0
Widowed	24	22.8	14	24.1	10	21.2
Employment Status						
Employed	20	19.0	3	5.1	17	36.1
Unemployed	4	3.8	0	0.0	4	8.9
Pensioner	24	22.8	4	6.8	20	42.5
Housewife	47	44.7	47	81.0	0	0.0
Self-employed	10	9.5	4	6.8	6	12.7
Level of Education						
Graduation	13	12.3	0	0	13	27.6
College	21	20	7	12.0	14	29.7
High school	22	20.9	16	27.5	6	12.7
Primary	28	26.6	20	34.4	8	17.0
None	21	20	15	25.8	6	12.7
Income level						
0-15K	15	14.2	11	18.9	4	8.5
15-25K	39	37.1	29	50	10	21.2
25-35K	34	32.3	15	25.8	19	40.4
35-45K	10	9.5	3	5.1	7	14.8
>45K	7	6.6	0	0	7	14.8

Figure 1: Percentage distribution of user and non- user of herbal product

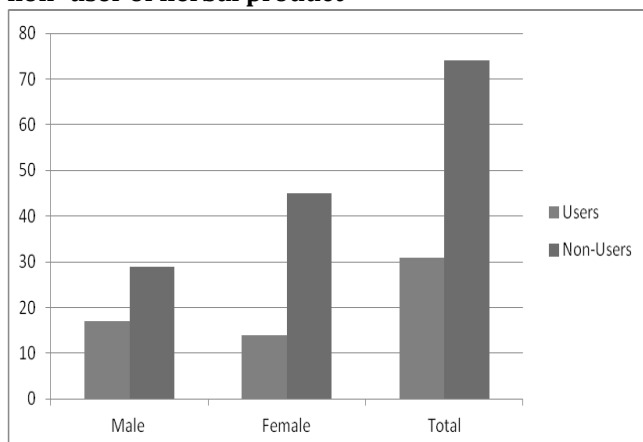


Table 2 illustrated that about one fourth of the total participants had been recently diagnosed with the diabetes. Maximum percentages of females (27.5%) were diagnosed diabetic for 15 years where as 30% of male lasts from in between six to ten years. Very few percentages of patients were under the dietary treatment. Seventy percent of people were relying on oral agents where 40% were female and 30% were male.

However 20% of total population depends on insulin only and 6.6% of total population depends on both- insulin as well as on oral medication. Hypertension was the most common co-morbid condition reported in the patient files.

Table 2: Duration of diabetes and treatment taken by patients (N=105)

VARIABLES	FREQUENCY/PERCENTAGES					
	Total group (n=105)		Females (n=58)		Males (n=47)	
	n	%	n	%	n	%
Duration of diabetes						
0 – 5 years	26	24.7	15	25.8	11	23.4
6 – 10 years	27	25.7	13	22.4	14	29.7
11 – 15 years	26	24.7	16	27.5	10	21.2
16 – 20 years	14	13.3	6	10.3	8	17.0
21 – 25 years	6	5.7	3	5.1	3	6.3
26 – 30 years	6	5.7	5	8.6	1	2.1
Treatment/ medication						
Diet only	5	4.7	2	3.4	3	6.3
Oral agents	71	67.6	39	67.2	32	68.0
Insulin	22	20.9	12	20.6	10	21.2
Combination	7	6.6	5	8.6	2	4.2

Table 3: Glycemic control of participants (N=105)

VARIABLES	FREQUENCY/PERCENTAGES					
	Total group (n=105)		Female (n=58)		Male (n=47)	
	n	%	n	%	n	%
Fasting blood glucose levels (N=105)						
Lower than 100 mg/dl (Normal)	22	20.9	13	22.4	9	19.1
100-125 mg/dl (IGT)	32	30.4	15	25.8	17	36.1
Higher or equal than 126 mg/dl (DM)	51	48.5	30	51.7	21	44.6
HbA_{1c} levels (N=105)		(n=105)		(n=58)		(n=47)
<5.7 % Normal	3	2.8	3	5.1	0	0
5.7- 6.4 IGT	11	10.4	7	12	4	8.5
> 6.5% DM	91	86.6	48	82.7	43	91.4

Results for fasting blood glucose levels and the HbA_{1c} levels are summarized in Table 3. Assessment of blood glucose control over the previous three to four months by means of HbA_{1c} measurements confirmed that most participants (86.6%) had high level of HbA_{1c}.

Perception and use of herbal remedies

Out of total population only 29.5% of people are using the indigenous product for their treatment. Among them, 17 were male and 14 were female (figure 1). The frequencies of using these products are in fig 2. The total percentage of using fenugreek is 42% , aloe Vera 35%, bittergaurd 29% and so on. However, very little percentages of people were using bottle guard, neem, and hibiscus and guava leaf. Various indigenous herbal products were used by the patients. Among them fenugreek, Aloe Vera, bitter guard, bottle guard, black berry are the common one (figure 2).

Regarding the source of information for the use of indigenous product, the total 48.3% of the people were taking the advice by their friends and family whereas; both internet

and neighbor contribute 22.5% individually. As it can be seen in fig 3, 32.2% (10) of the participants were using the indigenous product from less than 1 year, whereas 25.8% (8) of participants are relying on that from last three to four years. A very little percentage of 16.1% (5) depends on that from last five years of time.

The effectiveness of the product according to the subjects view, 16% (5) of the people agree for bitter guard and 6.4 % (2) for both blackberry and fenugreek. Nearly 32.2% (10) of people has no idea regarding the effectiveness of the herbal product.

Lastly the effectiveness of the product is summarized by score of five. The full score is given by only one female whereas each 32.2% of people scores two and three out of five. The score of one is given by 12.9% of people. Regarding beliefs of controlling blood glucose, 67.7% of people have faith on that and 10% do not have. Less than 10% do not have any proper idea whether the product is useful or not for controlling their blood glucose level.

Figure 2: Types of herbal product used

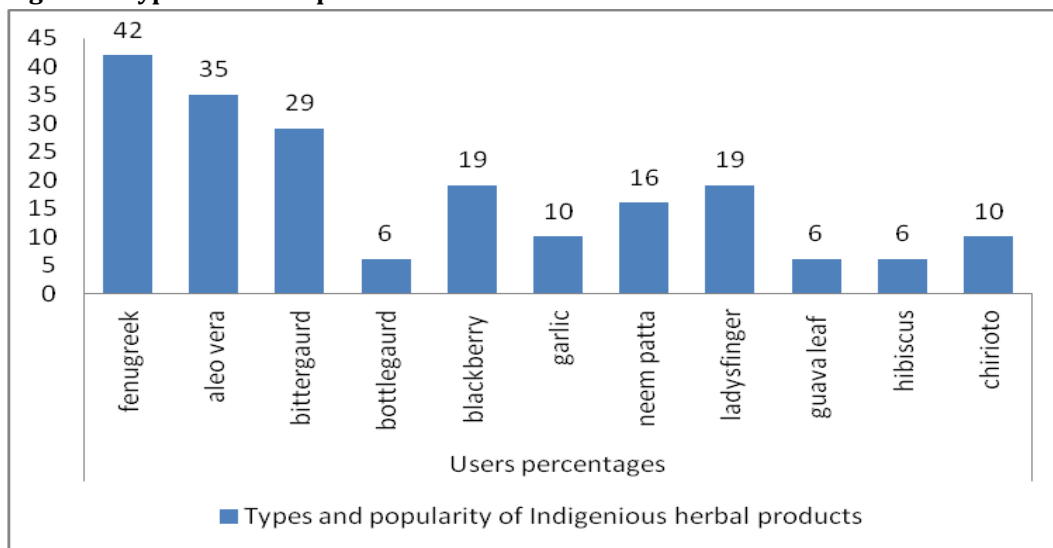
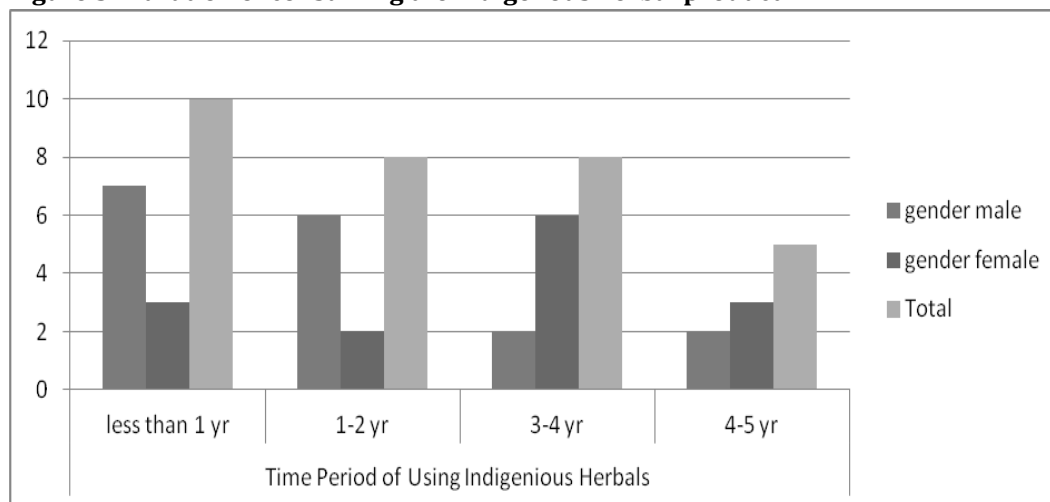


Figure 3: Duration of consuming the indigenous herbal product



DISCUSSION

The results of the study indicated that the majority of patients with T2DM who participated in the study, were between the ages of 60 and 69 years and are married. 42.5% of male participants were pensioner and 81% of the female were housewife. Most females (50%) had a monthly salary of 15-25 thousands whereas 40.4% of the male participants were earning 25 to 35 thousands per month. It is clear from those figures that most of the participants are spending

sedentary life style and earning properly. Low physical activity increases the risk of developing diabetes mellitus [5, 6].

Many patients in south east Asian region of the world are motivated to use several alternative system of medicines like ayurveda, homeopathy, unani or they uses some indigenous product for controlling their blood glucose level [7]. The use of such product is popular in this region due to their easy availability, low cost and lesser or no side effects [8]. About 30% of the total study

patients were using herbal treatment along with their allopathic medication. Among the participants using indigenous herbal products, more than half of them were happy with the effectiveness of the product. Less than 10% do not have any proper idea regarding whether the product is useful or not for controlling their blood glucose level. Twelve percent of participants said they simply don't trust the indigenous product. Sixteen percent of participants are using these products from at least 5 years and most of them believe on the effectiveness of bitter gourd, black berry and fenugreek has really worked well among all the products for controlling blood glucose level.

According to a survey by Barnes et al released in 2004, herbal therapy or use of natural products other than vitamin and minerals are the most commonly used Complementary and alternative medicines (CAMs) [9]. WHO estimates that 80 percent of the worlds population presently uses herbal medicines for some aspects of primary health care [10].

In present study most of the participants (42%) were using fenugreek for complimentary treatment of DM. It is one of the oldest most commonly used medicinal plants that have special place in traditional Indian, Greek and Egyptian medicine for its wide therapeutic use. Fenugreek contains a diverse number of constituents like steroids, amino acids, vitamins, polyphenolic compounds which can act as anti-diabetic, anti-inflammatory, wound healing and gastro protective properties. Out of these properties anti-hyperglycemic property has long been used in effective control of diabetes mellitus [11].

The total of 35.4% of the participants of the study uses Aloe-Vera as herbal product in

DM. It has been reported that Aloe vera gel and its derived phytosterols have a long term blood glucose lowering effect and can be useful for type 2 DM patients [12]. Bergfield (2007) strongly presented Aloe vera as a herbal having hypoglycemic effect which is less expensive treatment of DM and have fewer side effects [13]. High molecular weight Aloe Vera gel (AHM) fraction obtained from water washed gel part results in significant decrease in fasting blood glucose level after 12 weeks concurrent use, 3 times daily [14].

Twenty-nine percentages of the participants were using bitter gourd in the present study as indigenous product for treating DM. The fruit also known as bitter melon, *Karela*, balsam pear contains high amount of Vitamin C, A, E, B1, B2, B3 and Folate. This fruit is rich in minerals including potassium, calcium. Zinc, magnesium, phosphorus and iron. It is a good source of dietary fibres [15]. Charantin, polypeptide-p and vicine are the major compounds that have been isolated and identified as hypoglycemic agents from bitter melon/gourd [3, 15].

Okra, commonly called lady's finger and Black berry also known as Jambul, Black Plum, Jamun etc is the next common (used by 19.3%) indigenous herbal product used by participants of the study as blood glucose level lowering agent in DM.

Okra (*Abelmoschus esculentus*) is a Popular health food due to its high fiber, vitamin, and folate content. It is good source of potassium and calcium. Okra contains high fibres which helps to lower blood sugar level simply by slowing down sugar assimilation through intestine [16]. Lengersfeld et al in 2004 reported that those who consumed okra everyday decreased clinical indication of kidney damage a lot more than the ones that

simply consumed a diabetic diet which implies frequent usage of okra might help to avoid nephropathy- one of the major complication of diabetes. It has high antioxidant activity and has several health benefits in human disease like diabetes, cardiovascular and renal diseases [17, 18].

Jamun (*Syzygium cumini*) seeds are reported to have ellagitannins (ETs) including corilagin, 3-6 hexhydroxyl diphenyl glucose and its isomer 4,6- hexahydroxy diphenyl glucose which has anti-diabetic activity [19].

Other herbal products used by the participants of the study are bottle gourd, hibiscus, guava leaf, garlic, neem etc. The therapeutic effect of those plants for DM and its complication are also reported in literatures [2, 3, 20-22]

CONCLUSION

Participants have good faith on use of indigenous herbal products and are using it. Fenugreek, Aloe-Vera, Okra, Black berry, Bittergourd, Neem, Bottle gourd, Garlic, Hibiscus and Guava leaf are commonly used herbal products by participants of this study. Above section shows various scientific researches showing the therapeutic uses of those products for blood glucose lowering and for avoiding complication of DM. But no consistent data regarding parts of plants being used, fixed dose or method of preparation of such product were found. So, further researches are needed to confirm the effectiveness of those indigenous products, including useful parts for therapy, dose and method of preparation.

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