

ORIGINAL RESEARCH ARTICLE (SURVEY STUDY)

Knowledge, Attitude, and Practice Related to Diabetes with Reference to Ayurveda and Yoga: An Institutional Survey

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ABSTRACT

Background: Diabetes mellitus has become a common disease among Indian population, with the rate of incidence of pre-diabetes increasing gradually. Their conversion to diabetes is rapid among Indians. This scenario is mainly due to unawareness of the condition. Hence, this study aims to evaluate the knowledge, attitude, and practice (KAP) related to diabetes in conjunction with the use of Ayurveda and Yoga for the same among visitors of Central Ayurveda Research Institute, Bengaluru.

Materials and Methods: An institutional-based, cross-sectional survey study was conducted with a sample size of 350 from October 2022 to January 2023. The data collected were analyzed statistically with a confidence interval of 95% and 5% error. Multivariate analysis with three separate ordinal logistic regressions was performed for KAP, keeping the background characteristics of the individual as independent variables.

Results: About 67.14%, 42.29%, and 74.57% had excellent knowledge, positive attitude, and good practice, respectively. Increase in age, female respondents, and mental stress had a significant association with knowledge. Rural residents and diabetic patients carried a positive attitude towards diabetes. Higher age was the only determinant of practice.

Conclusion: This study infers a satisfactory prevalence of knowledge and practice related to diabetes. However, there is a lack of a positive attitude. Proper education to refute the myths and strategies to provide appropriate guidance to make use of Ayurveda and Yoga for diabetes must be promoted.

1. INTRODUCTION

Diabetes has evolved as one of the most serious chronic diseases of the century, causing life-threatening, disabling, and expensive complications, reducing life expectancy.^[1] The 10th edition of the IDF Diabetes Atlas predicts that the prevalence of diabetes will be more prominent in middle-income countries or developing nations, where people with diabetes will live with it for a longer life, and major urbanization also occurs.^[3] It is estimated that in India, nearly 25 million people are pre-diabetics. More than 50% of the population is oblivious about their condition. This will lead to complications if

not detected early and treated.^[4] Karnataka is at 7th position among all states in India with a prevalence of 7.5% and Bengaluru is likely to be declared as the capital of diabetes in the state.

A considerable level of knowledge, attitude, and practice (KAP) has a major role in prevention, early detection, and halting the progression of the disease, and it differs depending on socio-economic conditions, cultural beliefs, and habits.^[5]

Very few KAP studies are taken up in South India, especially in Bengaluru and in an Ayurveda hospital. Hence, to understand the cognizance of diabetes among the general public (both diabetic and non-diabetic) and to create awareness about the right employment of Ayurveda/Yoga, a KAP survey was decided to be conducted.

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2. MATERIALS AND METHODS

A cross-sectional study of KAP related to diabetes was conducted from October 2022 to January 2023 with a sample size of 350, assuming 95% confidence interval and 5% error. Institutional Ethical Committee clearance (F.6-5/CARI/BNG/IEC Meet/2020-21/399[D]) for the study was obtained, and it was also registered in CTRI (CTRI/2022/07/043977 on July 13, 2022). People visiting the hospital were interviewed randomly, irrespective of their diabetic status. Sampling was done based on the following criteria: (1) above the age of 18 years (2) willing to give written consent to participate in the study.

2.1. Study Site

Central Ayurveda Research Institute (A peripheral unit of Central Council for Research in Ayurvedic Sciences, Ministry of AYUSH) was considered as it provides service to a diverse population of habitat, socio-economic, and educational background.

2.2. KAP Questionnaire

A set of 43 structured questions were designed, which was approved by the panels of the Expert Advisory Committee of Centre of Excellence in Madhumeha (Diabetes) and the Institutional Ethical Committee of Central Ayurveda Research Institute.

The knowledge section was related to basic understanding of diabetes, impact of external factors, symptoms, diagnostic methods, prevention, and role of Yoga in diabetes. They were assessed based on 5 5-point Likert scale with agree, disagree, and do not know options.

The attitude section included questions related to the temperament of diabetic and non-diabetic towards maintenance/prevention of the disease, individual's perspective on Ayurveda and Yoga intervention in the management of diabetes, myth-busting statements such as influence of sweets, jaggery, and honey on blood sugar levels. It comprised of agree-disagree-neutral options.

The practice section consisted of compliance and follow-ups, home remedies, diabetes accessories, and other product usage to maintain blood sugar levels. Participants were asked about their adherence to Yoga as a part of their routine to note the level of awareness about it. It contained a "yes" and "no" option to label.

2.3. Data Collection

The study was field-tested on few participants to identify the amount of time consumed per subject, acceptability, and understandability of the questions. Proper training pertaining to the constituted questionnaires and surveys was given to the social workers. Eligible candidates were recruited into the study after giving their written consent. Respondents, who were willing to read and answer the questions, were handed the survey form to fill in. Others were asked questions verbally, and the answers obtained were promptly written down by the social workers in the survey report form. The E-format of the responses was digitally maintained in spreadsheets.

2.4. Statistical Methods

Univariate analysis was done to obtain the frequencies and percentages of all the variables used in the study. Further, the variables were divided into 4 categories, namely "background characteristics," "knowledge," "attitude" and "practice."

KAP scores were performed after individually scoring each variable. For questions with positive (correct answer is a positive affirmation), a response of "no" was scored as 0, "don't know/not sure/neutral" was scored as 1 and "yes" was scored as 2. For negative questions (correct answer is a negative affirmation), a score of 0 was given to "yes," 1 to "don't know/not sure/neutral" and 2 to "no." After giving the individual scores, total scores of every individual were computed separately for KAP, and the ranges were analyzed. Considering the wider range of knowledge scores, a 5-point scale was used to categorize the individuals. As the attitude and practice scores had a significantly narrow range compared to knowledge scores, a 3-point scale was used. After categorizing the respondents into respective categories of KAP scales, the bivariate and multivariate analyses were carried out.

The study used ordinal logistic regression for the multivariate analysis, since the dependent variables were non-binary and ordinal.

$$\text{logit}(P(Y \leq j)) = \beta_j 0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \dots \dots \dots (1)$$

Where X_i 's are covariates ($i = 1, 2, 3 \dots n$), β_i 's are coefficients, Y is the ordinal outcome variable with $j = 1, 2, 3 \dots m$ categories and $P(Y \leq j)$ is the cumulative probability of Y less than or equal to a specific category $j = 1, 2, 3 \dots m-1$. The exponential of the coefficients β_i 's gives the adjusted odds ratios between the categories of the outcome variables, which is an important estimate in logistic regression and was used to answer our research question.

Three separate ordinal logistic regressions were performed for KAP keeping the background characteristics of the individual as independent variables. The background characteristics included age, sex, education, occupation, habitat, mental stress, diet, body mass index, family history, and a known case of diabetes. Regressions were performed after controlling the multicollinearity by ensuring that all pairwise Pearson correlation coefficients were <0.5 in the correlation matrix of covariates. Results were interpreted using adjusted odds ratios on the basis of P -values.

3. RESULTS

3.1. Demographic Characteristics of Respondents

Among 350 participants, majority was in the age group of 50–59 years (25.43%), male (52.86%), and had secondary education (27.14%). They were mainly into desk work jobs (46.57%), experienced less stress (46%), were of normal weight (40.86%), and followed a mixed diet (71.14%). 55.71% of the respondents did not have a history of DM, and 55.71% were non-diabetic [Graph 1].

3.2. KAP Scoring of Respondents

The results of the knowledge of participants were found to be 67.14% excellent, 28% good, 4% average, 0.57% inadequate, and 0.29% poor. Similarly, 54.57% participants exhibited neutral, 42.29% positive, and 3.14% negative attitudes. In the case of practice, 74.57% followed good, 23.71% neutral, and only 1.701% bad practice [Graph 2].

3.3. Knowledge Related to Diabetes of Respondents

Participants responded correctly to various questions in knowledge, which are as follows: 80.86% were aware of the term diabetes. The main causes of diabetes are hereditary (70.57%), mental stress (84%), obesity (69.14%), and for the statement that diabetes occurs after 40 years, 71.14% opined it is untrue. They believed pregnant ladies are at risk (69.43%), and 77.71% disagreed that it is a communicable disease. They reported that diabetes can be diagnosed through a blood

test (94.57%) and it can affect different organs such as the eyes, heart, and nerves (86%). Regarding symptoms, excessive urination (85.14%), delayed wound healing (90%), tiredness without physical activity (85.71%), and at the same time, it may not show any symptoms at all (50.29%) were stated. However, diabetes can be prevented by adopting a healthy diet and lifestyle (92.86%), but cannot be reversed or cured (37.71%). Yoga can prevent (86.57%) and manage diabetes (83.43%) and has psychological benefits (92%). Most of the subjects believed that Ayurveda had a treatment for diabetes (86.86%) [Table 1].

3.4. Attitude Related to Diabetes of Respondents

Majority of them stated that immediate care is crucial once diabetes is confirmed (90.86%), and to maintain it, regular medical care and follow-ups were essential (87.14%). They believed that if glucose is kept under control regularly, complications could be prevented (75.71%). Most of the participants were of the opinion that consuming sweets affected sugar levels (71.43%). However, 46.57% of them disagreed that consumption of jaggery and honey (45.71%) can also affect their sugar levels. Addictions such as smoking and alcohol were reported to have an impact on diabetes (78.57%). Considering the treatment aspect, participants were ambivalent about the intake of hypoglycemic agents while practicing Yoga (38.86%), and the same proportion of them proclaimed that medication could be discontinued (38.86%). Only 22.29% were confident about the fact that regular medicines must not be altered even if practicing Yoga. Likewise, majority of them were uncertain if their regular Allopathic medicine should be stopped or continued while using Ayurveda medicines (49.43%) [Table 2].

3.5. Practice Related to Diabetes of Respondents

When participants were asked what they would do or had done when first diagnosed with diabetes, most of them opted for “visit a doctor” option (91.14%) and 70.29% for lab investigations. Only 6.86% felt self-medication was enough initially to conquer diabetes. Subsequently, a greater portion of the subjects got their health check-up down regularly (88.29%) and consulted their doctors’ periodically (88%). They are prompt in taking their medicines (91.14%), but only a few are using additional accessories such as diabetic footwear (7.71%). Nonetheless, they follow diet restrictions (60.86%) and do not blindly use products based on media or advertisement (95.43%). 83.43% of them reported practicing physical exercise regularly, but only 28.29% performed Yoga regularly [Table 3].

Table 4 shows the adjusted log odds ratios obtained from three different ordinal logistic regressions of Background characteristics on Knowledge, attitude, and practice. From the table, the statistically significant determinants of KAP were identified on the basis of *P*-values.

3.5.1. Knowledge

Compared to 18–39 years of age group, 40–59 years of age group had 2.67 and 60 and above age group had 3.72 times the odds of having an excellent knowledge about diabetes. For females, the odds of having excellent knowledge were 3.56 times that of males. Compared to illiterates, intermediate/diploma and graduation/higher education people had 5.34 and 4.80 times odds, respectively, to show an excellent knowledge. For individuals with mental stress of medium level and high/extreme level, the odds of possessing excellent knowledge were 2.32 and 2.20 times, respectively, that of those with no/less stress.

3.5.2. Attitude

The odds of having a positive attitude towards the management of diabetes were 0.54 times among urban residents compared to

rural residents. Known cases of diabetes had 1.20 times the odds of carrying a positive attitude than those who were not diabetic. No other covariates showed a statistically significant relation with attitude towards diabetes management.

3.5.3. Practice

The odds of having good diabetes-related practices were 1.72 times higher among individuals aged 40–59 years and 2.13 times higher among those aged 60 years and above, compared to individuals aged 18–39 years. Age was the only variable that showed a statistically significant relation with practice related to diabetes.

4. DISCUSSION

According to this study, age, sex, and mental stress were identified as the determinants of knowledge about diabetes. An increase in age showed a corresponding increase in knowledge. Females had better knowledge about diabetes than males. Individuals with an increased level of mental stress had more knowledge. The determinants of attitude were habitat and sufferance from diabetes. Compared to urban residents, rural residents had a positive attitude. The known cases of diabetes were more likely to carry a positive attitude. Age was the only determinant of practice related to diabetes. A higher age influenced on developing a better practice among individuals.

Excellent knowledge of diabetes in this study is similar to few previous studies from Saudi women and Bangladesh, which also showed a good level of knowledge.^[5,6] However, studies from Asia, Africa, and the Middle East have shown a poor level of knowledge.^[7-10] However, comparison to these studies is difficult since the nature of population (diabetic and non-diabetic) and Likert scale (five-point scales) are dissimilar. This study also revealed variation in KAP results. Increase in knowledge increased the level of practice but decreased the attitude to neutral. This could be because of the prevalence of a lack of willingness to accept change in their food habits and ambiguity in following multi-disciplinary (Conventional, Ayurveda, and Yoga) treatment for the management of diabetes. Most of them knew about diabetes and its causative factor. They were aware of the general clinical features of diabetes, but fewer mass knew that diabetes could occur without any signs and symptoms. Majority of them believed that Yoga could prevent and manage diabetes. However, a little more than half of the mass considered diabetes to be a reversible or curable disease.

The study showed that an increase in age corresponds to increase in knowledge, which was similar to the studies from Saudi Arabia and Austria.^[11,12] Females had better knowledge and practice compared to males, but males had a better attitude in our study. The result of knowledge pertaining to gender is similar to the studies carried out in southern India and China, contrary to the studies from Bangladesh and Pakistan, where males had better knowledge on diabetes.^[13-16] This could be due to a lesser gender gap in education in Bengaluru, where the female literacy rate is 84.01%.^[17]

There was no significant association of education and knowledge in this study. Intermediate or diploma holders had better knowledge and attitude towards diabetes than other levels of education. However, all had a good practice with illiterates showing a remarkable frequency than others. One possible reason for this may be that people with no education are likely to follow only verbal instructions given by the physician and get less exposed to other influences. However, previous studies from Bangladesh, UAE, and Nepal have shown a significant association between the two.^[18-20] Individuals with an increased level of mental stress had more knowledge and good level of practice.

As stress is a predominant contributor to hyperglycemia, this was a favorable response from them. However, they maintained a neutral attitude towards diabetes.

Type-2 diabetes is more closely interlinked with obesity and has given rise to a new terminology called “diabesity.”^[21] In spite of this alarming health concern, 33.71% were overweight and 20.86% were obese. In the present finding, obese people had better knowledge on diabetes compared to other categories and also had a good practice. However, they had a neutral level of attitude towards diabetes.

As prevalence and propagation of diabetes is substantial in urban region, they had higher frequency in knowledge entity. Unexpectedly, rural residents showed a positive attitude and better practice towards the disease than urban dwellers. This may be due to a positive temperament towards physician’s advice and a healthy way of life they are adapted to. In this study, non-vegetarians had excellent knowledge and good practice than vegetarians but vegetarians had a positive attitude towards diabetes. Similar to the study from Nepal, there was significant association with the level of knowledge and practice to people having family history of diabetes.^[24] As a consequence of any illness prevalent in a family, the members directly and indirectly learn about the disease and their complications. Nevertheless the attitude towards diabetes was neutral. Retired people and diabetic patients exhibited better KAP when compared to working class and non-diabetic participants as more awareness and concern reign among this mass of population to protect their health and prevent complications.

Even though this study show cased excellent knowledge, there was a knowledge gap observed about reversibility and asymptomatic diabetes. People had a major misconception that jaggery and honey does not affect their glucose levels. They did not have clarity about usage of anti-diabetic drugs while practicing Yoga and Ayurveda. Majority of them did not indulge in extra self care measures like special footwear and other diabetic accessories. But the satisfactory part was in the fact that majority of them did not blindly indulge in media products for control or preventive aspect. Despite people believing in Yoga, the percentage of them performing it for their health benefit was minimal.

The limitation of this study is that the sample size is small and it is confined to a single Ayurveda hospital situated in semi-urban area of Bangalore. Hence this data cannot be a representative of the entire Bangalore population. A scope of extending this survey to institutes of other systems of medicine and including different areas of Bangalore has been realized from this survey which will give a better picture of KAP related to diabetes in terms of Ayurveda and Yoga among the population of Bangalore.

5. CONCLUSION

Although the awareness of diabetes is adequate, there exist few misconceptions and confusion in the public. The temperament of the population is not satisfactory. Since there is correlation between attitude and forming habits in the long run, it is crucial to adopt strategies or education pertaining to myths on diabetes and focus on inculcating appropriate usage of Ayurveda medicines and Yoga. Policies to encourage practice of Yoga should also be a prime target for better management and prevention of diabetes.

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7. AUTHOR’S CONTRIBUTIONS

All authors have contributed equally to conception, design, data collection, analysis, drafting, and final approval of the manuscript.

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9. ETHICAL APPROVALS

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10. CONFLICTS OF INTEREST

Nil.

11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

12. PUBLISHERS NOTE

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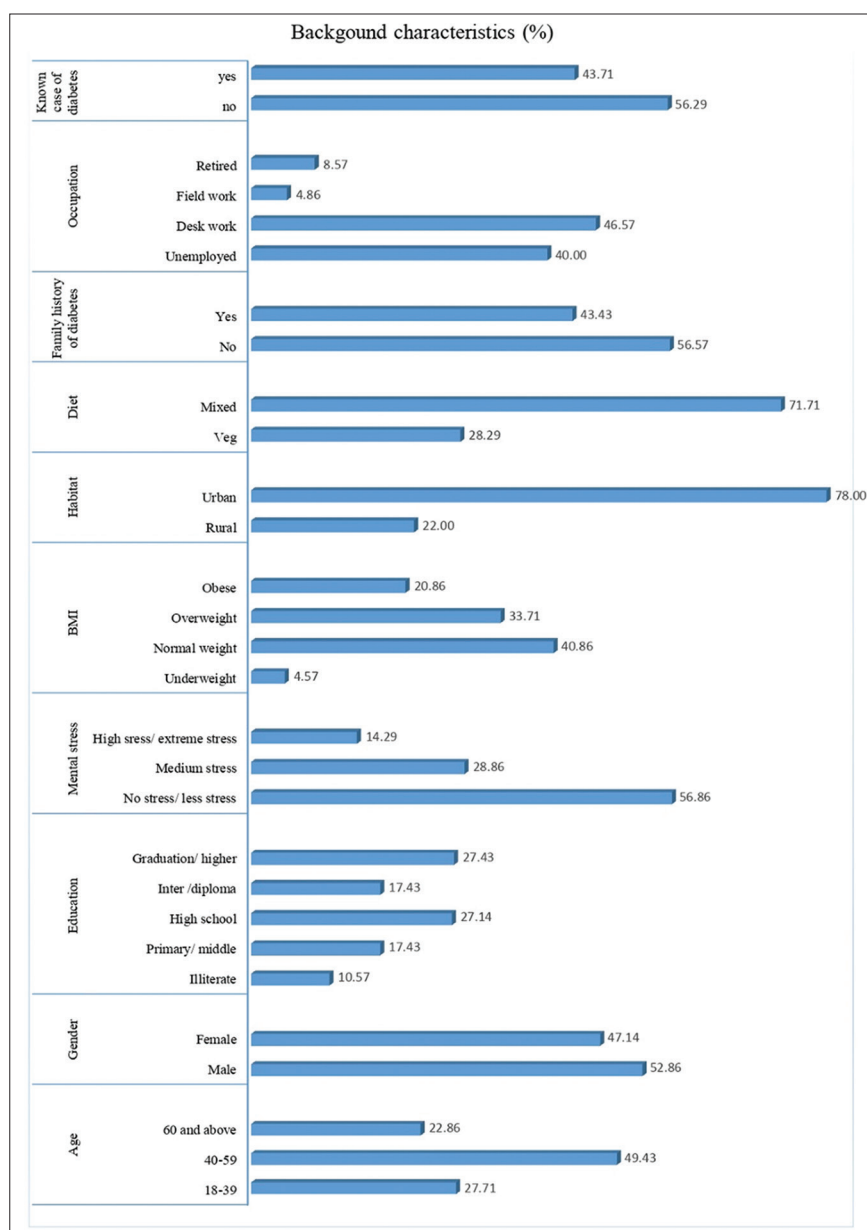
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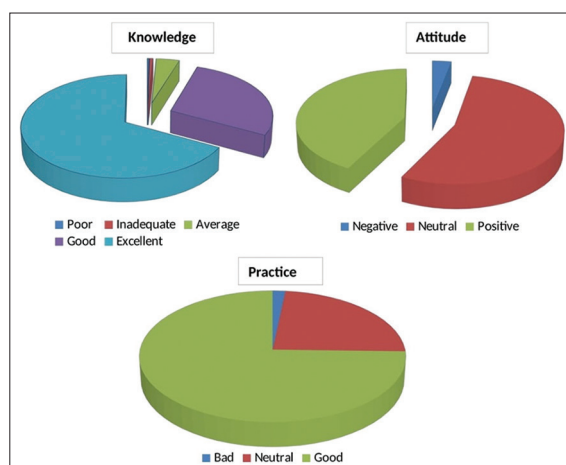
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Graph 1: Socio-demographic data



Graph 2: Knowledge, attitude and practice scoring of respondents

Table 1: Knowledge related to diabetes

Variable	Sample (n)	Percentage
Do you know what is diabetes?		
No	58	16.57
Don't know	9	2.57
Yes	283	80.86
Is diabetes hereditary?		
No	69	19.71
Don't know	34	9.71
Yes	247	70.57
Do you think diabetes occurs only in people older than 40 years?		
No	89	25.43
Don't know	12	3.43
Yes	249	71.14
Do you think mental stress level influences diabetes?		
No	26	7.43
Don't know	30	8.57
Yes	294	84.00
Can obesity have an impact on diabetes?		
No	53	15.14
Don't know	55	15.71
Yes	242	69.14
Are the pregnant ladies at risk of developing diabetes?		
No	42	12.00
Don't know	65	18.57
Yes	243	69.43
Do you think diabetes spreads from person to person?		
No	57	16.29
Don't know	21	6.00
Yes	272	77.71
Can diabetes be diagnosed through blood tests?		
No	11	3.14
Don't know	8	2.29
Yes	331	94.57
Excessive urination can be suggestive of diabetes?		
No	28	8.00
Don't know	298	85.14
Yes	24	6.86
Delayed wound healing is a common symptom of diabetes?		
No	15	4.29
Don't know	20	5.71
Yes	315	90.00
Tiredness without physical activity can indicate diabetes?		
No	21	6.00

(Contd...)

Table 1: (Continued)

Variable	Sample (n)	Percentage
Don't know	29	8.29
Yes	300	85.71
Do you think diabetes may not show any symptoms?		
No	115	32.86
Don't know	59	16.86
Yes	176	50.29
Diabetes can affect the different organs of the body such as eyes, heart, nerves, and kidney?		
No	21	6.00
Don't know	28	8.00
Yes	301	86.00
Diabetes can be prevented by adopting a healthy diet and lifestyle?		
No	11	3.14
Don't know	14	4.00
Yes	325	92.86
Can yoga prevent diabetes?		
No	25	7.14
Don't know	22	6.29
Yes	303	86.57
Can diabetes be cured or reversed?		
No	182	52.00
Don't know	36	10.29
Yes	132	37.71
There is treatment for diabetes in Ayurveda?		
No	7	2.00
Don't know	39	11.14
Yes	304	86.86
Yoga therapy can help in managing diabetes		
No	20	5.71
Don't know	38	10.86
Yes	292	83.43
Yoga has psychological benefits along with physical benefits?		
No	8	2.29
Don't know	20	5.71
Yes	322	92.00
Do you think that the diet can influence in causing diabetes?		
No	52	14.86
Don't know	25	7.14
Yes	273	78.00
Do you think sedentary lifestyle is a major cause of diabetes?		
No	46	13.14
Don't know	32	9.14
Yes	272	77.71

Table 2: Attitude related to diabetes

Variable	Sample (n)	Percentage
Do you believe that immediate care is necessary after diagnosis of diabetes?		
Disagree	20	5.71
Neutral	12	3.43
Agree	318	90.86
Do you believe that continuous medical care and follow up is necessary in diabetes?		
Disagree	21	6.00
Neutral	24	6.86
Agree	305	87.14
Do you believe keeping sugar control regularly can help to prevent the complications of diabetes?		
Disagree	14	4.00
Neutral	71	20.29
Agree	265	75.71
Do you believe sugar levels are affected by consuming sweets?		
Disagree	56	16.00
Neutral	44	12.57
Agree	250	71.43
Do you believe sugar levels are affected by consuming jaggery?		
Disagree	163	46.57
Neutral	76	21.71
Agree	111	31.71
Do you believe sugar levels are affected by consuming honey?		
Disagree	160	45.71
Neutral	73	20.86
Agree	117	33.43
Do you believe that addictions like alcohol and smoking can affect your sugar levels?		
Disagree	24	6.86
Neutral	51	14.57
Agree	275	78.57
Do you believe that you can stop the medication if you are practicing yoga?		
Yes	136	38.86
Don't know	136	38.86
No	78	22.29
Do you believe that you can stop the medication if you are using Ayurveda?		
Yes	120	34.29
Don't know	173	49.43
No	57	16.29

Table 3: Practice related to diabetes

Variable	Sample (n)	Percentage
What would you do if you notice any symptoms of diabetes/what did you do when you noticed symptoms of diabetes?		
Self-medication		
Yes	24	6.86
No	326	93.14
Visit a doctor		
Yes	31	8.86
No	319	91.14
Laboratory investigations		
Yes	104	29.71
No	246	70.29
Do you regularly get your health check-up done?		
Yes	41	11.71
No	309	88.29
Do you consult your doctor in regular intervals?		
Yes	42	12.00
No	308	88.00
Do you take your medications promptly?		
Yes	31	8.86
No	319	91.14
Do you follow diet restrictions?		
Yes	137	39.14
No	213	60.86
Are you using any products based on media advertisements for the control or prevention of diabetes?		
Yes	16	4.57
No	334	95.43
Do you use accessories like special footwear, etc.?		
Yes	323	92.29
No	27	7.71
Do you practice physical exercises such as walking, running, aerobics, cycling, and swimming?		
Yes	58	16.57
No	292	83.43
Are you practicing yoga therapy for the prevention or management of diabetes?		
No	251	71.71
Yes	99	28.29

Table 4: Multivariate analysis

Background characteristics	Knowledge		Attitude		Practice	
	AOR*	95% CI [†]	AOR	95% CI	AOR	95% CI
Age						
18–39 [‡]	1.00		1.00		1.00	
40–59	2.67 [§]	(1.44, 4.95)	1.01	(0.57, 1.79)	2.72 [§]	(1.45, 5.1)
60 and above	3.72 [§]	(1.5, 9.2)	0.93	(0.41, 2.12)	3.13 [§]	(1.17, 8.33)
Sex						
Male [‡]	1.00		1.00		1.00	
Female	3.56 [§]	(1.78, 7.11)	0.83	(0.45, 1.53)	1.95	(0.97, 3.9)
Education						
Illiterate [‡]	1.00		1.00		1.00	
Primary/middle school	1.56	(0.65, 3.76)	0.97	(0.41, 2.29)	0.50	(0.18, 1.44)
High school	1.81	(0.79, 4.14)	1.59	(0.7, 3.65)	1.00	(0.35, 2.82)
Inter/diploma	5.34 [§]	(1.99, 14.37)	1.92	(0.78, 4.73)	0.68	(0.23, 2)
Graduation/higher	4.80 [§]	(1.93, 11.93)	1.61	(0.68, 3.82)	1.03	(0.36, 2.97)
Occupation						
Unemployed [‡]	1.00		1.00		1.00	
Desk	1.72	(0.86, 3.45)	0.84	(0.44, 1.57)	1.21	(0.6, 2.47)
Field	1.24	(0.36, 4.28)	0.70	(0.21, 2.32)	0.75	(0.2, 2.79)
Retired	1.39	(0.45, 4.28)	0.79	(0.28, 2.2)	4.67	(0.88, 24.82)
Habitat						
Rural [‡]	1.00		1.00		1.00	
Urban	1.23	(0.69, 2.19)	0.5 [§]	(0.31, 0.94)	0.75	(0.39, 1.44)
Family size						
1–2 [‡]	1.00		1.00		1.00	
3 or 4	0.94	(0.44, 2.03)	0.84	(0.43, 1.65)	0.81	(0.34, 1.94)
5 or above	0.96	(0.43, 2.17)	0.70	(0.33, 1.45)	1.01	(0.4, 2.56)
Mental stress						
Nil/less [‡]	1.00		1.00		1.00	
Medium stress	2.32 [§]	(1.3, 4.15)	0.92	(0.55, 1.54)	0.98	(0.54, 1.77)
High/extreme stress	2.20 [§]	(1.04, 4.66)	0.81	(0.42, 1.58)	1.53	(0.69, 3.43)
Diet						
Veg [‡]	1.00		1.00		1.00	
Mixed	1.37	(0.79, 2.38)	0.75	(0.45, 1.26)	1.21	(0.67, 2.19)
Body mass index						
Underweight [‡]	1.00		1.00		1.00	
Normal weight	1.77	(0.61, 5.14)	1.54	(0.5, 4.74)	1.51	(0.46, 4.91)
Overweight	1.18	(0.4, 3.46)	1.47	(0.47, 4.57)	1.53	(0.46, 5.08)
Obese	1.80	(0.56, 5.74)	0.73	(0.22, 2.43)	1.51	(0.42, 5.41)
Family history of diabetes						
No [‡]	1.00		1.00		1.00	
Yes	1.48	(0.9, 2.44)	1.07	(0.68, 1.67)	1.37	(0.8, 2.32)
Known case of diabetes						
No [‡]	1.00		1.00		1.00	
Yes	1.11	(0.65, 1.9)	2.2 [§]	(1.35, 3.59)	1.36	(0.76, 2.43)

*AOR: Adjusted odds ratio, [†]CI: Confidence interval, [‡]Reference category, [§]Significant at $P < 0.05$