

Study of Knowledge, Attitudes, Practices, and Perceptions of Primary Care Physicians in India towards Dietary Intervention in Management of Patients with Type 2 Diabetes Mellitus

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Abstract

Background: Family physicians have a primary role in detecting, diagnosing, and managing diseases especially in a country burdened with Type 2 Diabetes mellitus (T2DM) cases. Unfortunately, the data on their knowledge about nutrition; one of the cornerstones for T2DM management, is missing from India

Aims: We aimed to assess the knowledge (K), attitude (A), practices (P), and perceptions (Pr) (KAPP) of Primary Care Physicians (PCPs) in India on nutrition management in patients with T2DM.

Method: A self-administered 7 questions-based survey was conducted amongst PCPs to gather from the period of December 2018- January 2019.

Findings: A total of 496 PCPs from metros (47%) and non-metro (57%) cities shared their responses. More than 90% (n=488) of the PCPs recommend dietary changes for patients on the diagnosis of T2DM with similar trends across regions. 402 PCPs (81%) recommended ≥ 2 dietary modifications which include; avoidance of sugars (83%), avoidance of foods with high carbohydrates (81%), and increase protein intake (58%), being the common ones. About 93% (n=463) PCPs actively discussed dietary recommendations even during follow-up visits. In terms of knowledge, Glycemic Index (GI)/ Glycemic Load (GL), n=429; was the most familiar nutrition-related term known by the PCPs followed by soluble fibre and Glucagon Like Peptide- 1 (GLP-1). Products promoted as Diabetes Specific Nutrition (DSN) and multivitamins came as the most preferred nutritional supplements with almost 70% and 47% PCPs recommendations, respectively. While majority of the PCPs (>50%) reported giddiness (a symptom of hypoglycaemia) as a complaint in <10% of their patients on oral anti-diabetic drugs, almost 90% PCPs felt DSN could help manage such cases if occurred.

Conclusion: PCPs in India do believe strongly in recommending dietary modifications and are keen to implement lifestyle interventions for patients with T2DM, however, they face challenges in doing so. The observed inclination of PCPs towards nutrition calls for further continuous and evidence-based awareness programs on nutrition to empower them on the way of better outcomes among patients with T2DM.

Keywords: Diabetes mellitus, Diabetes Management, Medical Nutrition Therapy, Lifestyle Intervention, Diabetes Nutrition

Conflict of Interest: The authors are full-time salaried employees of Abbott Nutrition International.

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Introduction

India is projected as the world's capital of diabetes mellitus ⁽¹⁾. The prevalence of T2DM in India was 73 million in 2017 and the numbers are expected to rise to 134 million by 2045 witnessing a swift surge of this non-communicable disease ⁽²⁾.

One can correlate a rapid lifestyle evolution to modernization, "unhealthy" diets with refined foods, low physical activity and associated stress with the rise of this non-communicable disease ^(3,4). What makes this condition of great concern globally is its association with various micro and macrovascular disease especially renal failure and heart ailments impacting overall health as well as economic aspect of India ⁽⁵⁾.

While lifestyle management including Medical Nutrition Therapy (MNT) remains the cornerstone in the management of type 2 diabetes ⁽⁶⁾, principles of nutritional management are often poorly understood by both clinicians and their patients. Briefly, MNT is defined as a "nutrition-based treatment provided by a registered dietitian or nutritionist." It includes "a nutrition diagnosis as well as therapeutic and counselling services to help manage diabetes ⁽⁷⁾.

While there are multiple studies from countries around determining knowledge and practice of physicians on role of nutrition in patient management (8-13); there have been none from India to the best of our knowledge. Thus, we conducted this survey to understand the knowledge (K), attitude (A), practices (P) and perceptions (Pr) (KAPP) of Primary Care Physicians (PCPs) on nutrition management for patients with T2DM.

Study Design and Methods

A brief 7-questions based survey form (Fig 1) was developed determining each K, A, P & P aspects about nutrition from PCPs standpoint as described in Table 1.

The self-administered pen-paper style survey form was then provided to 497 PCPs, representing their opinions from across 65 cities (4 metropolitan and 61 non-metropolitan cities) of India. After explaining the purpose of study briefly

Table 1. A 7-questions questionnaire with closed ended questions was developed with an intention to gather information on:

Attributes	Description	Questions from the form
Attitude	Attitude towards nutrition management and its follow up	Questions 1 and 5
Knowledge	Nutrition interventions recommended based on knowledge and understanding	Question 2 and 6
Practice	Current situational nutritional practices	Question 3 and 4
Perception	Perceptions about available options	Question 7

1- Do you recommend change in routine food habits, once a patient is diagnosed with type 2 diabetes mellitus? Yes No

2- What dietary changes do you recommend in such patients (Select all that apply)?

- No need to modify regular diet and comply with the prescribed medicines
- Reduce food intake
- Avoid sugar
- Cut down on carbohydrates (chapati/ rice/ potatoes)
- Cut down on fruits
- Increase in protein intake

3- Do you actively discuss the above dietary recommendations with your patients during the follow-up visits? Yes No

4- Do your patients on OADs (oral anti-diabetic drugs) complain giddiness, (excluding the ones on insulin)

- None
- <10%
- 10-25%
- Above 25%

5- Do you recommend any diabetes specific nutrition formula in such cases?

- Not required
- In all cases
- As & when required

6- Which of the terms seem familiar (select all that apply)?

- Carbohydrate counting
- Glycemic Index & load
- Carbohydrate quality
- Soluble fiber
- Insoluble fiber
- GLP-1

7- Which nutrition supplement you routinely recommend in type 2 (select all that apply)?

- Multi-vitamin capsules/tablets
- Protein Supplement
- Sugar free formula
- Diabetes specific formula

Fig 1

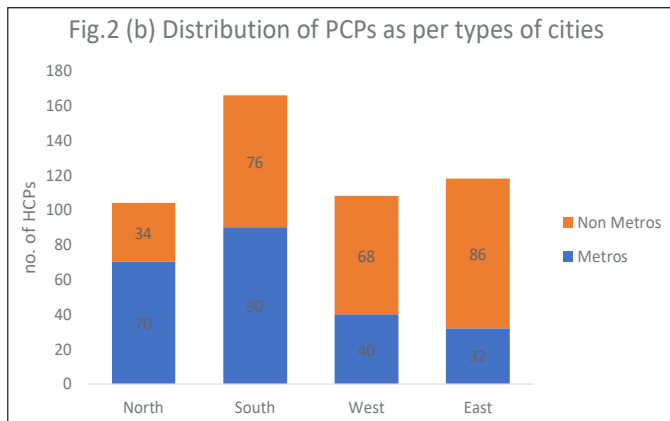
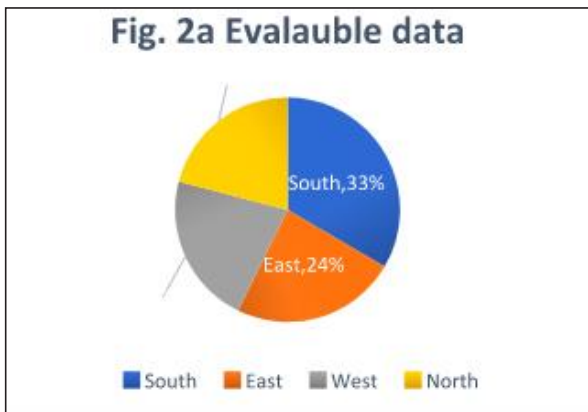
and a consent, PCPs were requested to fill in the questionnaire. The data was collected in a period of 60 days i.e. from December 2018 to January 2019. Data entry and evaluation was completed by April 2019.

Results

The questionnaire-based responses were collected from 497 PCPs from across India. However, due to incompleteness of one form, 496 forms were included for analysis. PCPs responded from metro cities and non-metro cities were 47% (n=232) and 53% (n= 264) respectively (Fig. 2a).

Region-wise data is shown in fig.2a, 2b.

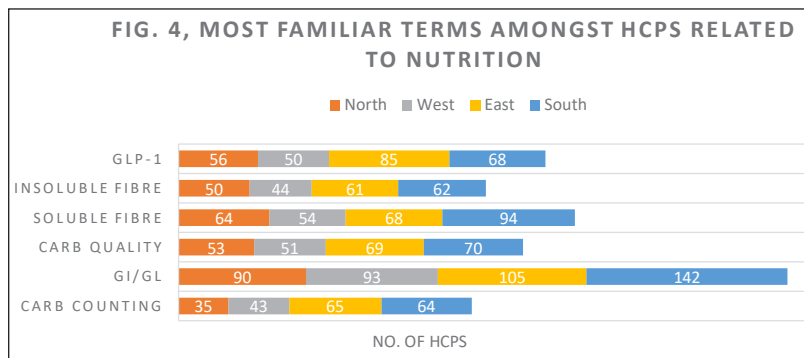
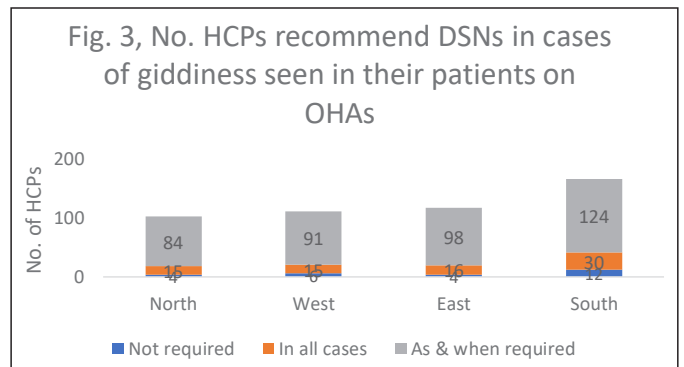
Of the 496 HCPs, 98% of the HCPs recommend

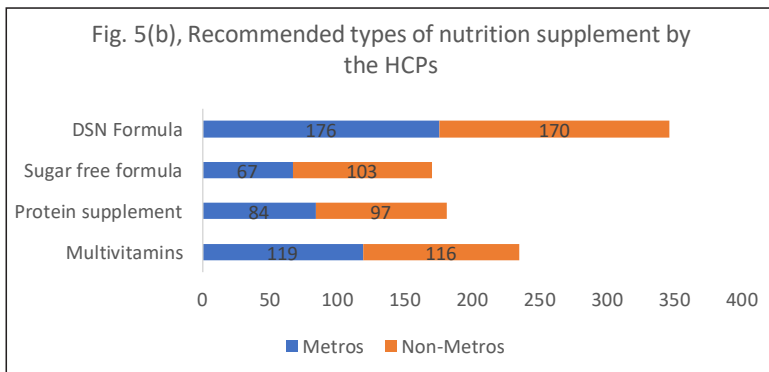
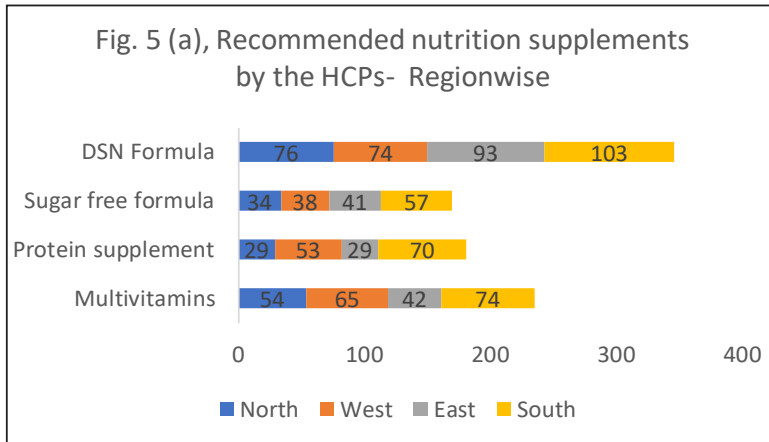


changes in routine food habits during the first visit of a newly diagnosed patient with T2DM. Avoidance of sugar (83%) and limiting foods with high carbohydrates (81%) were the most common recommendations. This was followed by increasing protein intake (58%) and reducing and overall food intake (39%). A total of 402 PCPs (81%) recommended ≥ 2 dietary modifications and almost 93% (n=463) PCPs actively discussed dietary recommendations even during follow-up visits.

When being asked about prevalence of giddiness, a potential symptom of hypoglycemia, amongst their patients on Oral Hypoglycemic Agents (OHAs); 52% (n=260) of them said <10% followed by 24% of PCPs stating 10-25% of their patient's complaint about it. About 18% PCPs stating that none of their patients' complaint of giddiness and only 5% said giddiness was noticed in >25% of the cases who were on OHAs. Responses related to nutrition interventions for patients experiencing giddiness, almost 80% recommended the use of Diabetes Specific Nutrition (DSN) formulas for patients fig. 3. The responses had similar trends in metro and non-metros cities across regions.

To gain deeper insights of the participants on their knowledge about carbohydrates and familiar terms related to it, almost 85% of them said GI/GL seems most familiar term followed by soluble fiber (57%) and GLP-1 (52%), fig. 4





When asked about their preference in recommending the type of nutrition supplement for T2DM patients, almost 70% (n=346) preferred diabetes specific nutrition (DSN) followed by multivitamins (47%, n=235); fig. 5a and 5b. The trend remained similar region wise and across metro and non-metro cities

Discussion

Nutrition counselling has the potential to play a key role in the nation's health promotion and disease prevention efforts in the 21st century⁽¹⁴⁾. This survey helped us determine the common perspectives of PCPs towards nutrition management of their T2DM patients. Overall, our data suggests that 98% of the PCPs across India recommend change in routine food habits as soon as they are diagnosed with the condition and 95% of them continue to emphasize on the suggested nutritional recommendation even during follow up visits.

Similar finding was shown by Nicholas L *et al*⁽¹⁵⁾ where 97% of Australian General Physicians provided some nutrition counselling either by assessing patients diet (66%) or by patient's willingness to change their diet (59%)⁽¹⁴⁾. Also, Eaton *et al*⁽¹³⁾ found similar responses in their cross-sectional study where only 2% (n=3) physicians did not provide nutrition counselling

in the 2-day study period. This is contrary to the findings by Kushner R.⁽¹²⁾ that, only 40% of the patients coming to the physicians were counseled on nutrition. Studies from different countries have established the fact that health professionals spend little time on dietary and physical activity counselling with diabetes patients⁽¹⁶⁾.

Silagy *et al*, 1992 indicated that one can help minimize the burden of chronic disease following simple two-step approach. Firstly, identification of the at-risk individuals and, secondly, wherever possible lifestyle modification advise with thorough follow-up should be given to manage the associated risk factors⁽¹⁵⁾. PCPs in this survey also tried mapping the dietary guidelines as majority recommended to avoid sugars or carbohydrates followed by increasing protein intake or reducing overall food intake. Research indicates that low-moderate carbohydrate meals may result in improved glycemic control, weight loss and which in turn may reduce medications for individuals with type 2 diabetes⁽¹⁸⁻²¹⁾.

Another commonly prescribed intervention was avoidance of sugar. Dietary sugar (sucrose) contributes a variable, usually small, proportion of blood glucose, from glucose directly and from fructose after metabolism in the liver. A widespread misunderstanding is that blood glucose is derived directly from the diet, and that sugars are particularly potent at elevating blood glucose. In fact, while pure glucose does cause a rapid rise in blood glucose, owing to its high glycemic index, other saccharides do not. Sucrose and fructose have medium-low glycemic indices respectively. However, a high consumption of extra calories as sugar can obviously contribute to weight gain and T2DM development⁽²²⁾.

Giddiness or dizziness, a classical sign of hypoglycemia understood by patients well, which is often overlooked, is the most common and serious side effect of glucose-lowering therapies⁽²³⁾. In a study including 366 T2DM patients on oral hypoglycemic agents, dizziness was the most commonly reported symptom (81.4%) followed by weakness and drowsiness⁽²⁴⁾. The same study reported, satisfactory level of patient-awareness (~66%) about hypoglycemia⁽²⁴⁾. Repeated episodes of hypoglycemia can result in significant morbidity and mortality and thus, a cause of concern. Timely recognition of risk factors for hypoglycemia, self-monitoring

of blood glucose levels, selection of appropriate treatment regimen and educational programs for healthcare professionals and patients with diabetes can help to maintain good glycemic control, minimize the risk of hypoglycemia and thereby prevent long-term complications^(23,24). In our survey, majority of the respondents suggested that giddiness is not common in their patients with T2DM on OHAs and only 5% of the PCPs reported that >25% of their patients experienced giddiness.

Hypoglycemia prevention is the preference for any healthcare provider and diabetes specific nutrition which contains slowly digested modified carbohydrates with high fiber and MUFA content have shown to reduce episodes of glycemic variability in T2DM patients⁽²⁵⁻²⁹⁾. Our findings are on similar lines where 80% of the respondents believe in recommending DSN as and when required for cases of hypoglycemia.

In a 1995 pivotal study, Kushner described the attitudes, practice behaviors, and barriers to the delivery of nutrition counselling by primary care physicians and called for a multifaceted approach to change physicians' counselling^(12,30) practices. The barriers cited in recent years continue to be those listed by Kushner: lack of time and compensation and, to a lesser extent, lack of knowledge and resources⁽¹²⁾. Also, in recent study by Parker *et al*⁽³¹⁾, where they evaluated the knowledge and practices of primary-care HCPs and final-year students regarding the role of nutrition, physical activity and smoking cessation (lifestyle modification) in the management of chronic diseases of lifestyle found less than 10% achieving the desired scores of 80% or higher⁽³¹⁾. However, in our study PCPs were found to be well versed with the carbohydrate-specific terms and 85% of them knew Glycemic Index/ Glycemic Load followed by dietary fiber. This is in line with the carbohydrates recommendations given by American Diabetes association and Indian doctors suggesting the importance of low-moderate GI/GL and high fiber diet in managing blood glucose levels better^(3,32,33).

GLP-1 though not a pure nutrition-related term, was known by more than 50% of the PCPs. Glucagon-like peptide 1 commonly known as GLP-1, is an incretin that has the potential to reduce blood sugar levels in a glucose-dependent manner by enhancing the secretion of insulin. GLP-1 is also known as satiety hormone. DSNs has shown to increase GLP-1 secretion, thereby resulting in improved glycemic control. The slowly digesting, low glycemic carbohydrate blend and monounsaturated fat blend in DSN plays a key

role for GLP-1 response⁽³⁴⁻³⁶⁾. Multivitamins followed PCPs preferred dietary modality after DSN in nutrition management of T2DM cases. Sugar-free formulas and only protein supplements were not recommended much comparatively.

We found similar trend of responses for almost all 7-questions across metropolitan vs non-metropolitan towns, highlighting a strong percolation of uniform nutrition related understanding in PCPs located at different regions.

Medical Nutrition therapy is an effective and affordable therapeutic approach that should be made an indispensable component of T2DM prevention and management⁽³⁾. An estimated 300,000 to 800,000 deaths per year are due to preventable nutrition-related diseases, such as coronary heart disease, stroke, hypertension, diabetes mellitus, obesity, and certain cancers⁽¹⁴⁾. The Academy of Nutrition and Dietetics systematic review of cost effectiveness of MNT reported: "Based on six cost effectiveness analyses, lifestyle interventions for diabetes prevention were cost effective in terms of cost per quality-adjusted life years gained compared to pharmacotherapy or no intervention"⁽³⁷⁾. Previous research has shown that the majority (72%) of primary care physicians consider nutrition counselling to be their responsibility⁽¹⁴⁾.

We conclude that, PCPs in India do believe strongly in recommending dietary modifications and are keen to implement lifestyle interventions for T2DM, however more exclusive than inclusive. The observed inclination of PCPs towards nutrition calls for further continuous awareness programs on nutrition to empower them on the way of better T2DM patient outcomes.

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