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Original Research Article

Educational booklet for elders with type 2 diabetes mellitus

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ABSTRACT

Background: Consistently following and practicing the instructions given in the educational booklets helps in the disease awareness and its management.
Methods: The study was developed by formulating the booklet content; content selection and source reference; framing the content; artfully crafting the pictures; booklet layout; approval by the specialist and audience; modifying and proofreading. For content validation, the item-level content validity index (I-CVI) score and scale level content validity index (S-CVI) score of minimum 0.80 was considered.
Results: The booklet was created by focusing on 5 main aspects namely information about the disease and the importance about the lifestyle changes, exercises, advices that needs to be considered while exercising, footcare and fall prevention techniques. The recommendations made by the experts and the participants were accepted and incorporated in the booklet. The mean I-CVI and S-CVI scores are >0.90. The booklet was easy to read, understand and apply by the experts and participants.
Conclusions: The results indicated that validated booklet can be considered as a useful educational tool for promoting the wellness among the elders with type 2 diabetes mellitus.

Keywords: Booklet, Diabetes mellitus, Health education, Hyperglycaemia, Pamphlets, Type 2 diabetes mellitus

INTRODUCTION

Diabetes is among the four major noncommunicable diseases (NCD's) warranting immediate attention.[1] Economical changes, urbanisation and nutritional shift have spiked up the incidence of type 2 diabetes mellitus.[2] By the year 2025, the patients with diabetes mellitus will be six times more than the reported figures of 2016.[3,4] The complications associated with diabetes is seen to affect the physical and mental functioning and quality of life.[5,6] Unregulated diabetes mellitus (DM) results in serious short- and long-term consequences posing a threat to one's health, quality of life, healthcare cost and economic system.[7-12] The average spending on diabetes is 912 INR per visit, the direct cost of healthcare for diabetic individuals was 553 INR and indirect cost was 359 INR.[13] The diabetes is an expensive disease due to its chronic nature, the severity of its complications and the means required to control them. Studies done on Indians belonging to low income families report that they spend about one fourth of their income on the care of the individual with diabetes.[14] The cost is borne out of pocket by the individual or family income.[15]

Management of blood glucose levels are mainly evaluated with the help of hemoglobin A1c (HbA1c) test, which was experimentally shown to depict the glucose control. Testing the HbA1c levels in patients with diabetes shows the patients average glucose levels in blood during the last 2-3 months.[16] The American Diabetes Association has recently recommended HbA1c level with a cut point ≥ 6.5% for diagnosing diabetes as an alternative to fasting plasma glucose (FPG≥7.0 mmol/l) based criteria.[17] The International Diabetes Federation emphasises a proper

diet and adherence to medication, exercise and glucose monitoring for keeping diabetes under check.[18] For proper glycaemic control, patients usually follow self-management system involving diet management, exercise, drug administration, insulin administration and education regarding the condition and self-monitoring of blood glucose levels. Poor adherence to the exercise and diet recommendations by type 2 diabetes mellitus patients itself causes frequent hospitalisation, further increasing the financial burden on the patients.[19]

Regular use of educational materials and instructions helps the patients to gain overall knowledge about DM and forms basis for a new self-care regimen regarding disease process, and management, while information inadequacy affects the patient's compliance to management in a negative way.[20-22] Knowledge about diabetes was seen to play an important role in self-care management among diabetic patients.[23] A review done on 12 studies showed that selfcare education programs were helpful in increasing the patient's knowledge of diabetes; improving glycemic control, lipid profile, BMI, and BP control; reduce the risks of developing diabetes complications; improving adherence to medications, behaviour modifications, and quality of life.[24] Numerous studies have reported that health education for T_2DM has shown reduction in the cardiovascular risk factors and diabetes level, and improvement in the self-care behaviour.[25-28] A study done among 120 diabetic patients who were randomly assigned to either an educational program (N=60) or a control group who received the routine care (N=60) found that educational program group showed a significant reduction in the diabetic complications, symptoms and glycemic test scores.[29] A review of the literature shows the importance of the use of educational booklet in order to control the glucose levels among diabetic patients. However there arises a need for providing a comprehensive booklet addressing the foot care, fall prevention tips and home-based exercise for elders with type 2 diabetes.

This study aimed to construct and validate a booklet giving an overview about diabetes and its negative impact, importance of healthy eating and regular exercise, foot care practices, fall prevention techniques for home, safety advices and multicomponent home exercises for improving the flexibility, strength, endurance and postural balance. The aim of the study was to develop and validate a booklet for elders with type 2 diabetes mellitus.

METHODS

The booklet was developed in 3 steps.

Step 1: Development and designing of the booklet material for elders with type 2 diabetes mellitus (ET_2DM). Step 2: Validation of the booklet material by experts. Step 3: Evaluating the utilitarian value of the booklet material by elders with type 2 diabetes mellitus.

Step 1: Development and designing of the booklet material for elders with type 2 diabetes mellitus

An expertly and straightforwardly written educational instrument is essential for a patient's holistic treatment. The informative booklet was developed based on the experts' knowledge, skill sets and experience and a literature review. In the process of developing the educational material, a literature review was conducted using the keywords as "diabetes", "type 2 diabetes mellitus", "diabetes mellitus", "exercise", "rehabilitation", "multicomponent", "footcare practices", "fall prevention", "booklet", "information", in Google scholar, Pubmed, Science direct, Research gate, Pedro, and Cochrane data bases. The booklet concentrated on 2 major aspects; providing essential information and offering exercise regimen for the elders with type 2 diabetes mellitus. The exercise regimen focused on the improving the aerobic capacity, strength, flexibility and functional balance.

Step 2: Validation of the booklet material by experts

The members of a multidisciplinary team of 11 experts validated the contents of the booklet's preliminary version. The content validity and format of the draft booklet were read by experts in the field to ensure the messages were right and could be understood easily. The researcher met experts for the content validation process and handed them directly a direction sheet, booklet and checklist. The experts were asked to read the material and suggest changes in relation to the content, clarity and language of each of the items. A choice of "agree" or "disagree" was given indicating an item in the scale as acceptable or unacceptable respectively. The acceptable implies that an item on the scale is acceptable and valid for these populations. The experts were given the free will to give comments and suggestions on the items of the instruments. The experts were required to sign the terms of free consent and informed consent form. At the end of the evaluation and after discussion with the research team, the recommendations of the experts were accepted and incorporated in the booklet.

Step 3: Evaluating the utilitarian value of the booklet material by elders with type 2 diabetes mellitus

Once consensus was achieved among the experts, the booklet's final version, was then evaluated by elders with type 2 diabetes mellitus. Patients were requested to read the booklet thoroughly, analyse figures and texts and give suggestions for improvement of the booklet. The patients were asked to read the instructions and perform the home exercises presented in the booklet and to comment on the comprehensibility and practicability of the exercise.

The study was examined and approved by the institutional ethics committee and the patients signed the terms of free will and informed consent. For statistical analysis, data were analysed using the Statistical Package

for the Social Sciences (SPSS), version 23. A content validation index >0.80 was considered as adequate for the experts. Statistical analysis of agreement among the participants for understanding and practicing were analysed using the Binominal test with a relevant p-value of <0.05.

RESULTS

The booklet was divided into 5 sections- information, footcare, fall prevention techniques, exercises and safety advices (Figure 1).

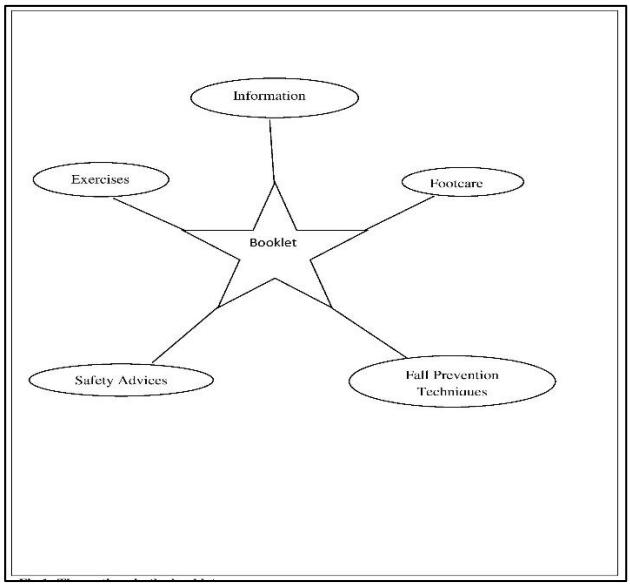

Figure 1: The sections in the booklet.

The safety advice section clearly indicated the do's and don'ts for the exercise regime like not exercising immediately after eating, avoiding over-exercise, adjusting the exercise considering the weather. An exercise self-evaluation form was included with booklet so that the patients can monitor their progress. The booklet avoided medical terminology and used short and simple words with the pictorial presentation. Highlighting techniques like enclosing text with a box to help the reader quickly identify the topic being addressed which is appropriated to the readers, particularly the older adult. The titles and headings were printed in a large size font and set apart from the text so as to attract more attention.

Table 1: Distribution of the content validation index.

Experts	Variance	Mean±SD	Cronbach's alpha
11	10.61	12.27±3.25	0.97

The experts included a team of 11 members belonging to department of medicine (n=2), cardiology (n=1), diabetology (n=2), orthopaedics (n=1) and physiotherapy (n=5) having immense knowledge and experience in clinical and research area. The I-CVI and S-CVI of the score above 0.80 were accepted (Table 1, Figure 2). At the end of the evaluation and after discussion with the research team, the recommendations of the experts were accepted and incorporated (Table 2).

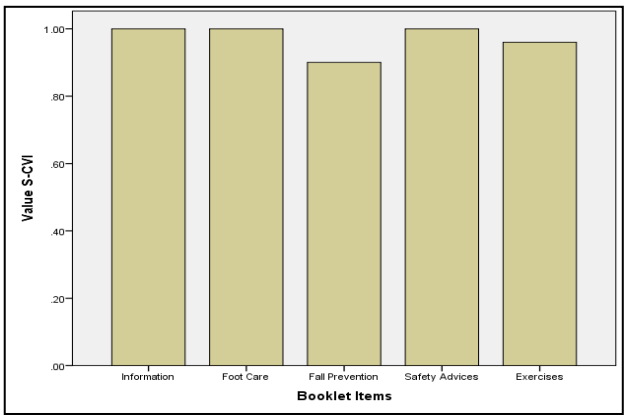

Figure 2: Distribution of the scale content validity index.

Table 2: Summary of analysis of the expert's recommendations.

Recommendations from the experts
Simple language, Reframe the sentence
Do not go barefoot or without wearing slippers. Use comfortable footwear (Slippers with straps/shoes)
Too strenuous exercises- Modify or opt for another exercise.
Add few exercises like sitting weight shifts, reach out and standing weight shifts, reach out in standing (can be goal directed or task related activity) walking with narrow base of support.
Test your glucose levels and when to resume the exercise was informed.
Subject could be made to sit on a chair with back rest
"cotton" socks
Photographs
Place the switch next to bed or lamp.
Use "R"/ "L"/ both sides
Break for 2 minutes as 1+1 minutes
Static marching could be considered
Position- standing/walking

The mean duration of the type 2 diabetes mellitus since onset was 2.4±1 years. Out of the 10 participants, majority of the participants were less than 60 years of age (70%); males predominated (80%). The educational qualification of the participants ranged from minimum of 5th standard and maximum of 8th standard. All the participants were married (Table 3). The participants positively assessed the booklet and indicated that they were able to understand and follow the instructions for practicing (p=0.002) (Table 4). The suggestions of participants were considered in the final version.

Table 3: Characteristics of the participants interviewed (n=10).

Characteristics	Group	N (%)
Age (in years)	50-59	7 (70)
	60-69	3 (30)
Gender	Females	2 (20)
	Males	8 (80)
Education	5th std.	2 (20)
	6th std.	3 (30)
	7th std.	1 (10)
	8th std.	4 (40)
Diabetes duration	<5 years	2 (20)
	5- 10 years	4 (40)
	10-15 years	2(20)
	15-20 years	2 (20)

Table 4: Evaluation of agreement of the participants (n=10).

	Response	N	Observed prop.	Test prop.	Exact sig. (2-tailed)
Practice Group	Agree	10	1.00	0.50	0.002
Understand Group	Agree	10	1.00	0.50	0.002

DISCUSSION

Health based education is useful in promoting awareness about good health, wellness, and beneficial in promoting health, self-reliance and improving effectiveness of the treatment.[30] Written information is widely accepted by the masses with positive changes noted in their knowledge, memory, mindset and behaviour towards their disease.[31] The construction of educational materials requires scholarly background to deliver the knowledge to make the masses understand the message clearly and easily.[32] We incorporated the directives along photographs for this purpose. This booklet was designed to guide and direct patients to engage in self-care and physical exercise at home. The inclusion or exclusion of certain materials originally used was based on the literature, opinions by experts and feedback from patients.

The health information materials must include methodological knowledge, professional expertise and participants choices allowing the material to be adopted as per preferences and culture of participants and the experts experience.[32-37] Following the content validation process the results of the current study revealed a high level of agreement among experts (S-CVI>0.80).[33,37,38] It means that the experts considered the content, language, layout and design, and illustrations appropriate to elders with type 2 diabetes mellitus. The formulation of the content of the informative booklet should be in line with the belief and priorities of patients. A well-developed material should help the patient to easily grasp the contents of the booklet material and helps to improve the knowledge of their diseases and increases the level of contentment.[39,40]

The evaluation of the booklet by the participants demonstrated that its written content was easily understandable and practicable. The suggestions participants referred to was included in the final draft. The active contribution of patient's opinion in evaluating the booklet's contents helps to satisfy and consider their demands. The first limitation was that the sampling was done conveniently, which makes the generalization of results limited to some extent. Secondly for evaluation, we provided different assessment tool for experts and the participants which made it impractical to correlate between the insights of the two groups.

CONCLUSION

The objective of the present study to develop and validate a booklet for elders with type 2 diabetes mellitus was fully met in the process. The results of the validation study showed satisfactory acceptance of the booklet by the experts and the patients. A clinical trial is being developed to evaluate the effectiveness of the booklet for elders with type 2 diabetes mellitus.

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