

Do Practice Nurses in the Caribbean have the Knowledge of the Principles and Concepts of Diabetes Self-Management Education?

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Abstract

Aim: To compare the knowledge of practice nurses on principles and concepts of diabetes self-management education (DSME) before and after a DSME training workshop.

Methods: All 150 practice nurses currently studying for a bachelor's degree were invited for a 2-day DSME training workshop. 88 practice nurses (59%) responded. Each participant was requested to complete and return self-assessment questionnaires before and after the training. The pre- and post-workshop knowledge of the nurses were compared using Wilcoxon Signed Rank Test for non-parametric tests in SPSS.

Results: The practice nurses were aged between 20 and 62 years and the majority (95.1%) were employed in the public sector. Before the training, 98-100% of the participants knew and agreed with the five articulated principles of DSME and these did not change after the workshop training (all, $p > 0.05$). Similarly, their understanding (96-100%) of the concepts of DSME before and after the training were similar (all, $p > 0.05$).

Conclusions: The practice nurses in Trinidad and Tobago have sufficient theoretical knowledge of the principles and concepts of DSME. The transfer of this knowledge to their patients in their care will depend on the educational infrastructure available to facilitate efficient DSME.

Keywords Diabetes self-management; Diabetes complications; Diabetes education; Developing countries

Introduction

Based on the reports of the International Diabetes Federation (IDF), the challenges of diabetes epidemic are more in the developing regions of the world [1]. Although there is considerable regional and international campaign initiatives aimed at preventing diabetes on the entire globe [1], the majority (80%) of diabetes-related deaths take place in the developing countries of the world [2]. Therefore there is the urgent need to focus more on preventing diabetes complications through intensified diabetes self-management education [3]. Although there are reports of low budgetary allocation for healthcare in some developing countries [4], training the patients on diabetes self-management practices would assist in reducing diabetes complications. There are several research studies that have confirmed that non-pharmacological interventions assisted in controlling glycemia in type 2 diabetes patients and subsequently prevent diabetes complications [5-7]. Furthermore, a culturally competent diabetes self-management education (DSME) has been demonstrated to assist in reducing blood glycemia and improve the patients' diabetes knowledge score [8]. It is well recognized that nurses are usually involved in the promotion of diabetes self-care [9], but nurses who have not had acquired the necessary diabetes education may lack the ability to provide such education. For instance, some research studies have shown that nurses' diabetes knowledge score are between 64.3% and

75% [10,11]. A more recent UK research report showed that practice nurses' knowledge score on diabetes increased from 66% pre-education to 86% post-education programme [12]. The previous reports that many patients do not usually get formal diabetes education or encouragement for diabetes self-care might be related to the practice nurses' insufficient diabetes knowledge [13,14]. Therefore, the present study aimed to compare the knowledge of practice nurses on principles and concepts of diabetes self-management education (DSME) before and after a DSME training workshop in a Caribbean Island.

Methods

Subjects recruitment

All the 150 practice nurses who enrolled in a bachelor's degree programme of the University of the West Indies, Trinidad and Tobago were invited (through posters and announcements during formal classes) for the 2-day diabetes self-management education (DSME) training workshop. Of the 150 available practice nurses, 88 (representing 59%) registered for the workshop and participated in the training exercise.

Study Protocol

A questionnaire tool consisting of three sections: (i) Bio-data with seven closed-ended questions, (ii) five questions on the principles of DSME and (iii) six questions on the concepts of DSME were used for the assessment. To preserve the anonymity of the practice nurses, the

questionnaires did not contain any personal identifiers except that the questionnaires were serially numbered in duplicate to facilitate matching the pre-workshop and post-workshop knowledge of each participant. During the registration for the workshop, each practice nurse was given two copies (pre- and post-workshop assessment questionnaires) bearing the same number but differentiated with a “pre-” and “post-workshop” mark on top right-hand side of the questionnaire. Each participant was asked to complete and submit the pre-workshop assessment questionnaire before the commencement of the workshop. Two DSME professionals facilitated the workshop using information contained in several published research reports on DSME [5-7,15,16]. The training focused on the principles (frequent and sustained patient contact, patient-healthcare provider’s joint decision-making via dialogue, continuous patient education and support, assisting patients in goal-setting etc) and concepts (need for daily/ weekly/monthly journal to record self-monitoring activities, patient understanding of physiological and laboratory data, patient self-monitoring of body weight, BP, blood glucose, diet and exercise activities, patient regular consultation with healthcare providers, emphasis on patient acquisition of self-care skills etc) of DSME. It also included the behaviour modification theories, how to enhance self-efficacy necessary skills of DSME and how to follow up evidence-based practice.

The two facilitators each gave 2-hour didactic lectures on DSME (total 4 hours) and subsequently there was small group brainstorming sessions of an hour in groups of 8 to 10 participants. During the small group discussions, the participants were asked to brainstorm (based on their experiences at their places of work) on the provision of DSME and the challenges of such education at their places of work. The two facilitators went from one group to another listening to each group’s brainstorming sessions. At the end of the small group discussions, all the groups converged at the large lecture theatre and one representative of each group made a presentation based on their brainstorming session. The presenters dwelled on what they considered as the benefits and challenges of DSME based on their experiences in their places of work. Feedbacks were taken from the facilitators as appropriate. After this large group session, the participants were requested to complete and return the post-workshop assessment questionnaire tool.

Statistics

The Statistical Package for the Social Sciences (SPSS) was used for the statistical analysis. The participants’ knowledge of the principles and concepts of DSME pre- and post-workshop were compared using Wilcoxon Signed Rank Test for non-parametric tests for two related samples. The data were presented as absolute number and percentages (in parenthesis). A p-value less than 0.05 was considered statistically significant.

Limitations

The workshop participants might show some selection/participant bias given that participants were part of practicing nurses who were undergoing some continuing professional development programme and so may not necessarily represent a typical practicing nurse in

Trinidad and Tobago. Also, the authors suspect that many of the nurses might have been exposed to other forms of chronic disease management education programmes in an Island country that is small. Further, many of the question items required a simple Yes/No response. Perhaps it was possible for many of the responses to be responded to correctly through common sense. However, we believe that any information garnered would go a long way in understanding the extent of need of DSME in the Island state.

Results

Table 1 shows the background characteristics of the participants. Of the 150 practice nurses were invited for the workshop, 88 (representing 59% response rate) registered and participated. Of the 88 participants, eight (10%) did not return their post-workshop assessment questionnaire and were thus excluded in the data analysis. The participants were aged between 20 and 62 years and the majority (95.1%) were employed in the public sector. The majority (60%) of the practice nurses were people of African descent while 17.7% were of mixed ethnicity (Table 1). The participants’ knowledge of the principles of DSME before and after the workshop are shown on Table 2. Almost all the participants (98-100%) knew and agreed with the five articulated principles of DSME and these did not change after the workshop (all, p > 0.05). Table 3 shows the participants’ understanding of the concepts of DSME before and after the workshop. There were no significant differences in their understanding of the concepts of DSME before and after the workshop (Table 3, all, p>0.05).

Parameters	participants		
	Male	female	Total
Qualifications			
Registered Nurses, N (%)	4 (4.5)	69 (78.4)	69 (78.4)
Registered Nurse and Midwife, N (%)	-	15 (17.0)	15 (17.0)
Employment			
Employed, N (%)	4 (4.5)	75 (85.2)	79 (89.8)
Not employed, N (%)	-	9 (10.2)	9 (10.2)
Work place			
Public, N (%)	4 (4.9)	74 (90.2)	78 (95.1)
Private, N (%)	-	4 (4.9)	4 (4.9)
Ethnicity			
African descent, N (%)	2 (2.4)	49 (57.6)	51 (60.0)
Indian descent, N (%)	2 (2.4)	17 (20.0)	19 (22.4)
Mixed ethnicity, N (%)	-	15 (17.7)	15 (17.7)

Table 1 : Background characteristics of the participants of the DSME training workshop.

Parameters	Responses of the participants			
	Agree	Don't agree	Not sure	p-value

The principles of diabetes self-management education encourage frequent and sustained patient contact with diabetes healthcare providers to facilitate behavioral changes.				
Pre-workshop, N (%)	79 (98.8)	1(1.3)	-	0.120
Post-workshop, N (%)	79 (98.8)	1(1.3)	-	
The principles of diabetes self-management education emphasis patient's-healthcare provider's joint decision-making process through dialogue.				
Pre-workshop, N (%)	79 (98.8)	1(1.3)	-	0.375
Post-workshop, N (%)	79 (98.8)	1(1.3)	-	
The principles of diabetes self-management education emphasis continuous patient education and support initiatives to produce positive effects.				
Pre-workshop, N (%)	77 (97.5)	2(2.5)	-	0.453
Post-workshop, N (%)	77 (97.5)	-	2(2.5)	
The principles of diabetes self-management education include assisting patients in goal-setting to facilitate achievement of the self-care effects.				
Pre-workshop, N (%)	79 (100)	-	-	1.000
Post-workshop, N (%)	79 (100)	-	-	
Diabetes self-management education includes results in improved physiological data, the patient's quality of life and reduced diabetes complications.				
Pre-workshop, N (%)	79 (100)	-	-	0.630
Post-workshop, N (%)	79 (100)	-	-	

Table 2: Assessment of the participants' knowledge of the principles of diabetes self-management education (DSME).

Parameters	Responses of the participants			
	Agree	Don't agree	Not sure	p-value
A programme of diabetes self-management education includes patient's daily or weekly or monthly journal to record self-monitoring activities.				
Pre-workshop, N (%)	80(100)	-	-	0.250
Post-workshop, N (%)	80(100)	-	-	
A programme of diabetes self-management education includes teaching and interpretation of laboratory and physiological data.				
Pre-workshop, N (%)	77(96.3)	1 (1.3)	2(2.5)	0.219
Post-workshop, N (%)	77(96.2)	1 (1.2)	2(2.5)	
A programme of diabetes self-management education includes self-monitoring skills in measuring indices such as weight, BP, blood glucose, diet and physical exercise activities.				
Pre-workshop, N (%)	80 (100)	-	-	1.000
Post-workshop, N (%)	80 (100)	-	-	
A programme of diabetes self-management education includes emphasis on regular consultations with physicians/nurses to assist in goal setting and decision making.				
Pre-workshop, N (%)	80 (100)	-	-	0.250
Post-workshop, N (%)	80 (100)	-	-	
A programme of diabetes self-management education employs theoretical strategies such as cognitive behavior therapy, social skills training and cognitive reconstruction method.				
Pre-workshop, N (%)	77(97.5)	1 (1.3)	1 (1.3)	0.390
Post-workshop, N (%)	77(97.5)	1 (1.3)	1 (1.3)	

The overall objective of diabetes self-management education is for the patient acquisition of self-care skills.				
Pre-workshop, N (%)	75(98.7)	1 (1.3)	-	0.219
Post-workshop, N (%)	75(98.7)	1 (1.3)	-	

Table 3 : Assessment of the participants' knowledge of the concepts of diabetes self-management education (DSME).

Discussion

This study compared the knowledge of practice nurses on the principles and concepts of diabetes self-management education (DSME) before and after a DSME training workshop. The analysis of the data showed that the majority (96-100%) of the practice nurses knew the theoretical principles and concepts of DSME before the training. These findings are very encouraging especially coming from a developing high-income country [17]. These findings are discussed in relation to provision of DSME in work places in developing countries.

The current findings from an acute research study showed that practice nurses who are doing a bachelor's degree programme have the theoretical knowledge of the principles and concept of diabetes self-management education (DSME). On the basis of these findings, it could be argued that the practice nurses studied are theoretically well equipped to provide DSME to the patients in their work places. This interpretation is made in the context of a previous research report which showed that diabetes patients were poorly managed due to insufficient knowledge of DSME among nurses [18]. Indeed, other workers have also argued that nurses who have not had a specialized training in diabetes education may lack the ability to provide DSME [19]. The preceding argument put together, it is unclear if theoretical knowledge of the principles and concepts of DSME amongst practice nurses would translate to provision of DSME to the diabetes patients in their care. Nurses and dietitians in Trinidad and Tobago have previously opined that inadequate healthcare personnel, economic resources and educational facilities constituted significant barriers to provision of DSME in their places of work [4]. Although Trinidad and Tobago is classified as a high-income economy [17], diabetes education at the primary care clinics does not meet the requirements for effective DSME [15]. In most clinics at the primary care settings (where most patients reside), practice nurses usually conduct generalized diabetes education in non-structured format within a short time frame within the crowded chronic disease clinics. The clinic education class is not tailored to meet individual patient's needs/challenges or set goals for lifestyle modifications or made provision for feedback from the patients in the next clinic (Personal experience). The IDF advisory on DSME emphasized the importance of both DSME and diabetes self-management support (DSMS) in preparing diabetes patients in making well informed decision, coping with the challenges of living with diabetes and assisting in lifestyle modifications that support the patient's self-management efforts [1].

In view of the foregoing, we argue that the knowledge of the principles and concepts of DSME may not necessarily translate to provision of such education to the patients given that the quality of a healthcare system is largely dependent on its healthcare personnel and available economic resources. Diabetes self-management was described as a union between expert clinical care and expert self-care [20]. For a patient in a developing country to acquire the expertise for self-care, the healthcare system must provide educational and material support. For instance, it has been demonstrated that type 2 diabetes

patients who were provided with blood glucose monitoring facilities (glucometer, test strips, lancets, alcohol swabs etc) were able to self-monitor their blood glucose levels and subsequently had improved blood glycemia and reduced coronary heart disease risk profile [19]. Thus, the importance of diabetes self-management support (DSMS) is critical in the provision of DSME. For example while 94% of type 2 diabetes patients that participated in a research study on home blood glucose monitoring acknowledged that self-monitoring of blood glucose assisted in their blood glucose control, 70% indicated that self-monitoring of their blood glucose levels was a very expensive practice [21]. This would suggest that if there is no diabetes self-management support, the application of the theoretical knowledge from DSME will be ineffective. Previous studies have shown that many patients in developing countries have high theoretical knowledge score on the benefits of healthy lifestyle, yet there are high prevalence rates of the risk factors for cardiovascular disease and the metabolic syndrome amongst the same type 2 diabetes patients [22-28].

Thus DSME in developing countries need real material support to be successful. Given the low budgetary allocation to the healthcare sector in developing countries [4], it would appear that many health care systems may not be prepared for DSME [3]. It is recommended that governments of the developing countries should allocate adequate economic resources to the public health sectors to intensify DSME [4]. We therefore conclude that the practice nurses in Trinidad and Tobago have sufficient theoretical knowledge of the principles and concepts of DSME. The transfer of this knowledge to the patients in their care will require adequate educational infrastructure to facilitate the provision of diabetes self-management education.

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