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Implementing Diabetes Self-Care Management Education in St Lucia: The Community Health Nurses' Perspectives

Henry[1], D, MSN & Onuoha[1], P PhD*
[1] *The UWI School of Nursing, The University of the West Indies, St. Augustine, Trinidad and Tobago.*

Abstract:
Aim: *The overall goal of this study was to explore the perception of the Community Health Nurses in Saint Lucia on implementing DSME as a strategy to manage T2DM and to identify the factors that might impact its use if it is implemented.*
Method: *A descriptive exploratory qualitative design was undertaken to elicit the perceptions of six (6) CHNs from the different Regions in the Island nation. Semi structuredin-depth interview was the instrument used after gaining the nurses' consents. Their CHNs' responses were organized in themes and described as narratives from the transcriptions of their responses.*
Results:*A number of themes emerged. They include that the clients and relatives would be educated and therefore empowered to take responsibility for the management of the chronic illness; clients will view themselves as partners in the care; less visits to the wellness centers; among others.Also the need to form diabetes support groups to promote compliance in patients were offered.*
Discussions:*The congruity of the responses were noted with other published data.*
Conclusion: *The perceptions of the CHNs in St. Lucia ware decidedly favourable to DSME. The CHNs also offered their opinions as to how the make the strategy efficacious in St. Lucia among others.*
Keywords: *Community Health Nurses', Caribbean, DSME.*

I. Introduction

The incidence of diabetes mellitus (DM) throughout the world is increasing at a rapid rate such that the World Health Organization (WHO) has predicted that DM will be the seventh leading cause of death by the year 2030 (World Health Organization [1]. In 2013, greater than a million deaths were attributable to DM that is believed to affect 347 million individuals throughout the world [2, 3]. In the United States, 21.1 million people or 9.3% of the population are diagnosed with DM and another 8.1 million people or 27.8% of people with diabetes are undiagnosed [4]. In Saint Lucia more has the fastest growing number of diabetics across the nine-member sub-regional Organization of Eastern Caribbean States (OECS) [5] with International Diabetes Federation projecting the number of cases at 13,300 cases of diabetes in an Island whose population is 185, 868 [6].

In the primary health care setting diabetes is being treated largely by the physician through medication. They see clients at the clinics and prescribe routine medication and sometimes laboratory investigations. The Community Health Nurse (CHN) however, assists the doctor during a clinic session and renders care as the need arises for the clients. They provide counseling, teaching and support for those affected with the disease. The Community Health Nurses are in charge of the wellness center's entire running. They are responsible for coordinating all the services of the wellness centers. They work in collaboration with other health care professionals.

The Community Health Nurse, the community health aide and the wellness center attendants comprise the core staff for the delivery of nursing services at the primary level. Many other health professionals have a visiting relationship at the wellness centers; these include the nutritionist, family nurse practitioner, pharmacist, public health nurse and the medical doctor all of whom provide valuable services as key members of the highly motivated wellness Center based team. In addition the dental team, the mental health officers, the dermatologist and the pediatrician conduct clinics at selected health centers. The other members of the community based primary health care team comprise the environmental health officer, the health educator and the family life educator based in the schools. It is the CHN however, who is responsible for the coordination of the different health services at the wellness centers.

Diabetes Mellitus is a destructive medical condition, Centers for Disease Control and Prevention [CDC], (2012), defines diabetes as a group of diseases marked by high levels of blood glucose resulting from problems in how insulin is produced, how insulin works, or both. The CDC made it known that people with diabetes may develop serious complications such as heart disease, stroke, kidney failure, blindness, and premature death. The CDC identified two types of diabetes. (1). Type 1 diabetes which was previously called insulin dependent diabetes mellitus or juvenile-onset diabetes. Although disease onset can occur at any age, the peak age for diagnosis is in the mid-teens. Type 1 diabetes develops when the cells that produce the hormone

insulin, known as the beta cells, in the pancreas are destroyed. (2). Type 2 diabetes which was previously called non–insulin dependent diabetes mellitus or adult-onset diabetes because the peak age of onset is usually later than type 1 diabetes. In adults, type 2 diabetes accounts for about 90% to 95% of all diagnosed cases of diabetes. DSME is now being advocated worldwide for the management of Type 11 Diabetes. A number of studies have documented the efficacy of this strategy [2, 7, 8, 9, 10, 11, 12, and 13].

Klein, Jackson, Street, Whitacre, and Klein[14], in their meta-analysis study, assessed how successfully Diabetes Self-Management Education (DSME) interventions help people with type 2 diabetes achieve and maintain healthy blood glucose levels.The overall results showed that the DSME interventions significantly reduced A1c levels

Leyva, Zagarins, Allen, and Welch[15] in their diabetes self-management education intervention analysis to examine the relative impact of change in diabetes distress and change in depressive symptoms on change in glycemic control in Hispanic patients following DSME intervention. In Oman, it is believed to be a cheaper method and the added advantages of having patient meet and discuss with each other among others[16 and 17].

However, Al-Maskari et al. claimed that although diabetes self-management education is a cornerstone of diabetes many diabetics in the United Arab Emirates (UAE) lack sufficient knowledge about their disease due to illiteracy [18]. Other challenges to implementing the programme include, lack of easily retrievable electronic patient health information, inadequate coordination with other health care providers when implementing guidelines, conflict between information in the guidelines and physicians' knowledge, and physician compensation by patient load rather than by quality of care. Two main opportunities identified were the use of health coaches or nurses trained in diabetes self-management and active collaboration between practicing providers and key stakeholders in the development and dissemination of guidelines. Their study concluded that there a need for involving front-line family physicians and other primary care providers as well as patients in the design and development of best practice guidelines to enhance implementation of diabetes self-management guidelines in primary care settings [19]. Furthermore, despite significant advances in diagnosis and treatment, the persistence of inadequate metabolic control continues. Poor glycemic control may be reflected by both the failure of diabetes self-management by patients as well as inadequate intervention strategies by clinicians [20].

Given the prevalence of diabetes, and the antecedent costs of its management in the small economy Island of St. Lucia, the need to be creative, cheaper and innovative ways of managing the condition is advocated. Accordingly, the evidence that Diabetes Self Care Management Education (DSME) is a strategy with worldwide acclaim, may play an important role in reducing unnecessary medical visits, decreasing hospitalizations, reducing microvascular and macro-vascular complications, and improving quality of life[21]. Realizing all these benefits attributed to DSME and the fact that CHNs are in the forefront of diabetic care management at the primary level, it is important for their views on diabetes care management strategies to be sourced and implemented in diabetes care management. Indeed, the Community Health Nurses in St. Lucia could play a major in this strategy, by providing their perception of this strategies in dealing with this research issue given their availability and closeness to the diabetic patients in this Island country. Further, they are responsible for the involvement of the individual family and community in the diagnostic process and in discussion of how problem should be approached [22]. As a results, the researchers envisaged that documenting the perceptions of these frontline health personnel will provide the needed data for polices related to the research issue.

II. PurposeOf The Study

The purpose of this study is to document the perceptions of the CHNs in St. Lucia with regard to the implementation of DSME in the Island nation.

Research Questions

The following are the research questions for study.

1. What are the views of CHNs in Saint Lucia about implementing DSME as a strategy in diabetes care?
2. What are the benefits stated by the CHNs of implementing DSME as a strategy for diabetes care in Saint Lucia?
3. Are there any impediments toimplementation of DSME in Saint Lucia?
4. Are there any facilitate needed for the effective DSME in Saint Lucia, what are requirements of the CHNs, the clients, and the community?

III. Research Methodology

Research approach and design

A descriptive exploratory qualitative design was undertaken. This method gives authentic insight into people's experiences and is particularly appropriate in areas where nurses have little theoretical or factual

known knowledge. Qualitative research is designed to explore and interpret meanings of experience [23]. The current research focus was to explore CHN's perception of implementing DSME as a management strategy in the care of clients with T2DM. Qualitative studies allow for exploration or identification of problems or issues of concern. Creswell [24] concurs that problems are discovered and defined in detail in qualitative study. Furthermore, Boundless [25] postulates that the qualitative researcher aims at gathering in-depth understanding of human behavior and the reasons that govern such behavior. This design is based on the general principles of naturalistic inquiry with the results offering much information to apply and consider in the practice context but the disadvantage as some critiques put it is that the findings are not as rich in insight to the human experience as a true phenomenological approach [26].

Population/ Sampling

The study was conducted using community health nurses (CHNs) from the wellness centers around the island as the sole participants. Saint Lucia has thirty one (31) functioning wellness centers and two local district hospitals where CHNs work as primary health care providers; these wellness centers function as wellness centers and not hospitals however they are still referred to as hospitals when spoken about. There are approximately thirty two (32) CHNs to manage thirty one (31) wellness centers and the two local district hospitals. Some CHNs manage more than one wellness center. Majority of the wellness centers have one CHN, a few have two CHNs and some have none, but a CHN is assigned to manage those wellness centers without a CHN for identified clinics. The wellness centers in Saint Lucia are organized into regions and vary from three (3) to five (5) wellness centers per region. The following are the regions in Saint Lucia; Regions 1, 2, 3, 4, 5, 6, 7, 8A and 8B.

All the wellness centers on the island are within walking distance from the people living in the community. These wellness centers are government owned and services provided there are free or community members may pay a small fee for certain services. Each community in Saint Lucia has one wellness center.

A purposive sampling method was used to explore the perception of six (6) CHNs. The main goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best enable the researcher to answer the research questions [27]. Nine (9) wellness centers from each of the regions were telephoned. Six (6) of the CHNs responded favorably to participate in the study. The six (6) wellness centers were visited on the following day of the telephone call and an interview guide and consent form was hand delivered to each CHNs. Thereafter a date and venue for the in-depth interview was set with each one of them.

Ethical consideration

Ethical approval was granted by University of the West Indies St Augustin Trinidad and Tobago, West Indies Faculty of Medical Sciences Campus Ethic Committee. Interview was carried out only with full consent of the CHN being interviewed. They were assured anonymity and confidentiality. No names were entered on the interview guide used during the interview. No participant suffered harm by taking part in this study. They were free to discontinue from the study if they did not wish to continue no matter at what point they were at in the study. If they decide to discontinue from the study, they were assured that they would suffer no consequences. They were informed that they will not be paid to stay or be manipulated to participate if they decide to opt out of the study at any point during the investigation.

Selection and development of instrument

A semi structured interview guide was developed to appropriately explore the perception of the CHNs on implementing DSME as a diabetes care management strategy. Construction of this semi structured interview guide was done based on the purviews of nurses' perception on DSME, DSME benefits and DSME challenges. Steps adopted in the development of the tool were as follows:

- Review of literature, which provided sufficient information for the tool's groundwork.
- Consultation with colleague's experts who have knowledge on diabetes and DSME.
- Past and current knowledge of the researcher based on previous educational workshops provided relevant data necessary to construct the tool to explore after which a modified validated interview guide was developed for the purpose of the current study.

Description of the tool

The interview guide consisted of two sections which focused on different variables of the research.

Section A: Subjects' demographic characteristics = 8 items.
Section B: Interview questions on CHNs' perception of DSME= 14 items.
Some of the questions included were;

1. How old are you?
2. What region do you serve?
3. How long have you been a CHN?
4. What factors do you foresee may hinder the introduction of DSME in Saint Lucia?
5. What benefits do you attribute towards introducing DSME at your wellness center?

Pre-testing of the tool

Pretesting of the semi structured interview guide was done using a small sample of three CHNs who were similar in characteristics to those of the subjects under study, to check the clarity of the items, their feasibility and their practicality. These CHNs were selected using a purposeful sampling technique and they did not form part of the current study sample.

Procedure for data collection

Data was collected by means of semi structured in depth interviews. Semi-structured interviews are described as being conducted with a broad list of questions or topics to be discussed during the course of an interview [26]. The semi-structured in-depth interview provided the data necessary for this qualitative investigation. This was done using face to face means. Semi structured interview for the current study gave room for probing during the interview. Open-ended questions were used to allow the participants to elaborate on their responses on their views on implementing DSME in Saint Lucia.In qualitative study, data is collected through a number of source and highlights in-depth interview as a suitable strategy and explains that interview is used to get an understanding to experiences and meanings regarding the research problem [24]. Schneider, Whitehead, LoBiondo-Wood and Haber [23] explain that interview is a prime method of collecting qualitative data. These authors explain that interviews allow an interpersonal contact between the researcher and participant as it can be easier to gauge reactions to questions and non-verbal body language. Also, it allows the opportunity to give time for participants to expand on answers to the semi-structured questions.

The interviews were conducted at the CHNs' designated wellness centers at different dates and times previously agreed upon by them. Any participant who decided to discontinue from the interview was allowed to do so without suffering any harm. Consent forms which were previously distributed were collected prior to starting the interview. They were informed to utilize the interview guide which was given to them previously if they so desired. The researcher ensured highest respect and confidentiality during the interview and used appropriate intonation throughout the interviews. She demonstrated interest in the responses from the participants and maintained adequate eye contact since she was writing while participants gave their responses. She ensured to ask participants to repeat statement which was not clear and paraphrased to ascertain correct understanding and interpretation of responses. She assured anonymity as no names were placed on the interview guides. The interview lasted about twenty to thirty minutes each. After the interviews were completed, the researcher thanked the participants and asked them if they had any questions regarding the research. All of the participants expressed interest in the findings of the study. They were informed that once completed they will be informed of the results. The data collected were kept in a sealed, confidential folder that was opened and viewed only by the researchers. No participant suffered harm during the study and all of them completed the interview and commended the researcher for the conducting the research.

Data analysis

Data was analyzed for content that would be used to support other findings from the study therefore content thematic analysis was used. The information was grouped into broad themes, organized, summarized and presented in charts, descriptions and direct quotations of relevant verbatim responses and selected comments. Thematic analysis analyses the content of narrative data to identify prominent themes and relationships between these themes using selected styles [26]. The general inductive approach was chosen as a guide to assist the evaluation of the results of the study as raw data is condensed into brief summaries, establishing well-defined links between the objectives outlined in the research and the brief summaries [24, 25, and 26].

IV. Results

Demographics:

The following are the demographic data of the 6 participants with whom in-depth interviews were conducted.

Of the 6 interviewees, 1 was less than 30 years old, 2 were between the ages of 30 and 39 years, 2 were between the ages of 40 and 50 years and 1 was over 50 years old. Two of the 6 interviewees were employed as CHNs for less than a year, while 3 were employed as CHNs for 1 to 10 years and 1 was employed as a CHN for

over 30 years. Each of the 6 interviewees were stationed at different regions; represented were Regions 2, 5, 3, 6, 7 and 8A (Table1).

Table I showing Summary of Demographics for the 6 Interviewees

Participants	Age group	Nationality	Region/ Health Centre	How long have you been a CHN?
A	40	SLU	2	5 Years
B	28	SLU	5	4 months
C	57	SLU	3	31 Years
D	36	SLU	6	11 Months
E	38	SLU	7	6 Years
F	44	SLU	8A	7 Years

Responses for research questions

1. What are the views of the Community Health Nurses (CHNs) of implementing Diabetes Self-Management Education (DSME)?

Of the 6 interviewees only 1 indicated that she only knew of DSME somewhat. She articulated that she knew of diabetic self-care management but did not know that a program called DSME existed. The remaining 5 stated that they had knowledge of it. They described it as a program put in place to ensure that diabetic clients and their support systems are adequately educated along with the help of their health care providers to self-manage their diabetes condition well.

All interviewees agreed that implementing DSME was an excellent idea and were all excited to discuss the possibility of its implementation. When probed about why they responded in the affirmative, most respondents mentioned the fact that clients and relatives would be educated and therefore empowered to take responsibility for the management of the chronic illness, in how to eat, exercise and monitor blood sugars at home, taking ownership of the diabetes care management. Participant A stated:*"In terms of diabetes self-management, I believe to some extent the primary health care settings have been doing a fairly good job in empowering patients, but more can be done if there was enough time to conduct these sessions. Furthermore, a more structured program such as DSME would be more effective."*

The interviewees also indicated how prepared they were to implement DSME. Three of them enthusiastically exclaimed that they were ready to go, while the other 3 indicated that they would need training regarding DSME in order to be adequately prepared.

2. What are the benefits stated by CHNs of implementing DSME?

The interviewees all displayed physical excitement in discussing the possible benefits of implementing DSME. They flashed large smiles and had welcoming postures as they pondered and gave their responses. They stated that implementing DSME would be a good imitative for the island diabetic population. One of the stated benefits of implementing DSME was the fact that it would result in more educated and empowered clients and relatives who would be better able to manage their diabetes. Participant A stated: *"DSME would foster compliance; empower patients with information to engage in effective lifestyle modification".* Participant B reiterated by stating:

"DSME would result in better management of disease being reflected in lower sugar readings". It was further suggested that with patients feeling empowered they would also view themselves as partners in the care of their health and therefore be more responsive to their treatment. Participant C aptly stated:*"DSME would create empowerment of clients as partners in their care with the involvement of family and community members in providing care".* Participant D shared similar sentiments: *"There would be a decrease in the amount of unresponsive diabetic patients coming to our unit and an increase in lifestyle changes such as weight loss, and proper dieting".*

It was also stated that the DSME would educate the relatives of patients about the role of family history in the development of diabetes. Participant C indicated: *"DSME would create awareness in relatives about the genetic component of diabetes".*

Another benefit that was highlighted was that with DSME there would be a delay in the development of diabetes complications, if any, such as neuropathy, nephropathy, retinopathy, and cardiovascular diseases. Participant B indicated:

"With DSME there would be decreased morbidity and level of amputations".

Participant C stated:

"There would be "minimizing/delayed onset of complications with DSME".

Participant D hoped for complete elimination of diabetes complications:

"DSME would decrease, and in the long term eradicate the number of diabetic foot ulcers; decrease or eradicate incompliancy".

Some interviewees highlighted the financial and other benefits towards the clients in implementing DSME and state that it would upshot with the implementation of DSME. Participant B stated:

"DSME would increase productivity, decrease expenses on medication and supplies in the long term".
Participant E thought:
"DSME would decrease the number of times clients visit the wellness centre"
Patient F pointed out that:
"DSME would "increase years of life expectancy of diabetics, because of better management of condition with the increased knowledge; better adherence to medication, and less medical visits".
The final benefit was that DSME would facilitate training of health care staff, which would result in modernized and better quality of care to clients.
Participant F stated:*"DSME would be an opportunity to increase the knowledge of the staff members".*

3. What are the limitations stated by CHNs of implementing DSME?

When asked about the limitations of implementing DSME, the interviewees were a little less gun-ho and much more contemplative. They were observed twisting their bodies in their chairs and contorting their faces while they thought of their responses. However, after some thought, they were just as vocal in stating the limitations of implementing DSME.

One limitation was the fact that clients, relatives and health care workers may not be interested in participating in the educational programs for various reasons. Participant B stated:*"There may be a lack of interest by patients, and lack of cooperation between staff and patients".* Participant C agreed with the possible lack of interest, but added:*"There may be a lack of interest in health care providers, clients and family, because there was deficient support mechanism for continuity of care".* Participant D went further to state:*"There may be a lack of interest of clients, because of knowledge deficit of the condition, and possibly, denial of being diagnosed with diabetes".*Another limitation was the inadequate human, financial and medical resources within the wellness centres. Participant A stated:*"The lack of human resource may pose a barrier to the effective implementation of DSME, as the primary health care settings have inadequate staff. The quota of patients and overbearing responsibilities leave little time to properly implement and maintain this programme".*
Participant D pointed aptly stated:
"There is an unequipped medical team and limited resources to carry out programmes".
And Participant F reiterated:
"There was a lack of finances, and lack of support of key persons or groups for DSME to be implemented."
Another limitation was the lack of resources available to clients and relatives to be able to follow through with developed treatment plans. Participant D stated:
"Some clients were from low socioeconomic backgrounds and may not be able to afford all that is required for proper self-management"
Low educational level of clients and relatives was another limitation highlighted in the in-depth interviews. Participant E stated:
"Clients may be unable to understand the importance of the program and todemonstrate interest and willingness to better understand their illness".
Participant D further pointed out:
"Language may be a barrier, programs should be taught in creole".
The final limitation that was pointed out was that generally there was resistance to change and therefore health care staff and clients may not want to change how things are currently done.

4. To facilitate effective implementation of DSME, what are the requirements of:
a. The CHN

Interviewees seemed to become elated once again as they eagerly listed the perceived requirements of CHNs, clients and community.
Each interviewee indicated the need for training for themselves and others. Participant E stated:
"We need a continued education course on DSME".
The interviewees also required more staff who would be dedicated to the implementation of DSME. Participant C stated:
"We need more staff to complement the existing number of staff members for effective implementation of DSME. CHNs are already overwhelmed with the required responsibilities. Therefore, I need trained, dedicated personnel to conduct and manage training of clients and staff for implementation of DSME".
Another requirement indicated was consistent medical supplies, equipment and educational materials. Participant B stated:
"I would need adequate and readily available supplies and equipment".
Participant D stated:
"There must be funding to maintain the consistency of the DSME program".
Participant F continued:

"We need resources for community workshops, and health promotion talks".
Another requirement was support of other health professions. Participant A explained:
"We need adequate time and required resources; committed support staff such as podiatrist; fitness instructor, nutritionist, psychiatrist".
Participant F continued with:
"We require support from pharmacy service …support from Ministry of Health and private sectors".
Interviewees were also in agreement that the final requirement would be committed, compliant clients for DSME to be effectively implemented. Participant B stated:
"Clients must be willing to come to the educational programs … they must be compliant".

b. The Client
Family support and support groups were the first responses interviewees listed are requirements of the diabetic clients in the implementation of DSME. Participant B said about the client's needs:
"They need support of the family and support groups to provide support and keep them motivated".
Participant F went further to point out:
"They need family support … support from key persons in the family … like those who they listen to the most".
Interviewees also highlighted supplies as major requirements for diabetic clinics. Participant A stated:
"The diabetic need the necessary resources such as glucometers, glucose strips, and lancets".
Participant C went further to state:
"They need easy access to materials and supplies for everyday care".
Interviewees also stated that diabetic clients would need the support of other professions and possibly the involvement of other agencies. Participant D stated:
"The clients would need the support from institutions, government agencies and other team players like themselves to navigate through the challenges".
When probed to indicate which institutions and government agencies she thought would be most helpful she stated:
"Well the clients would need help with getting the glucometers and stuff like that. They need help to get food. So maybe they could help in those areas".
Reluctantly, and with a shrug of the shoulders and head tilt, Participant D continued:
"Maybe give discount on fruits and vegetables and diabetic supplies".

c. The Community
Of the 6 interviewees, 4 participants felt that the primary community-related requirement was to implement diabetes support groups to promote compliance in patients. Participant A stated:
"There needs to be more support at community level, like a diabetes support group ".
And Participant D stated:
"The community needs diabetic rehabilitation centres where clients would get programs to assist a diabetic support group in the community, like diabetics anonymous. Also a committee so clients could voice their concerns; and a switchboard for diabetics on the local radio station once a week".
Interviewees also stated that information on DSME would be useful to the community. Participant B stated
"They need a clear understanding of the program and what it entails because the community can also benefit from DSME as way of life".
Participant C indicated that:
"The community needs meaningful health education/ promotion programs".
The last requirement stated by participants was to have more resource persons in the community. According to Participant C:
"The community definitely needs substantially trained and qualified health care providers in diabetes care, like diabetes educators, physicians, nutritionists, podiatrists, fitness persons and social workers and others".

V. Discussion: Findings And Implications

The purpose of this study was to explore the perception of the CHNs in Saint Lucia on implementing DSME as a strategy to manage T2DM and to identify the factors that might impact its use if it is implemented.

As such, this study explored the CHNs' perception on implementing DSME on the island and it identified the CHNs' perceived benefits and perceived limitations on implementing this care modality. It also investigated whether they are willing to participate in DSME if it is implemented in diabetes care management in Saint Lucia.

The result from previous studies and other literature within this study are the yardstick against which the results of the current study are measured. This section explains in detail conclusions drawn from the study's results obtained from the interview. The findings of this study will be discussed based on the literature discussed

in the review and other literature within this study. The discussion will be done under the four research questions for this study.

Section A: Discussion related to CHNs' Perception of DSME

In this study all the six participants thought that implementing DSME was an excellent idea. They all reported that they will participate in DSME if it is implemented in Saint Lucia. They described it as a program that ensures that diabetics and health care providers are adequately educated to combat diabetes condition well. Although out of the six (6) participants one of them did indicate that she was not aware of a program called DSME but she has knowledge of diabetes self- management. The other five participants where very knowledgeable about DSME and were excited about the thought of implementing it in diabetes care management.

Further, although the CHNs thought that DSME was an excellent idea, however three (3) (50%) of them thought that preparation for providing DSME care was important and therefore they articulated that they need to be trained in order to be successful in DSME management strategies. Whereas the other three (3) (50) reported having sufficient knowledge to commence DSME. This finding is consistent with that of Tschannen et al. [2] where nurses also expressed how effective and efficient they would be at implementing DSME once they completed their multifaceted simulated training. They indicated that this type of training provided practical knowledge for their respective work settings and facilitated engaged learning for clients in a safe and relaxed environment. Additionally, the finding regarding the need for training in DSME where the participants reported that lack of preparation and technical knowledge among the health professionals on some aspects of diabetes mellitus and the health professionals' patient education practices along with work conditions and organization coupled with issues related or attributed to the clientele themselves and diabetes care model are all vital components in DSME. These findings undoubtedly climax the perspective of this study. This is supported by Torres et al. [13]

Moreover the CHNs in the current study, although they believe that DSME was a vital aspect of diabetes care and thought that there were many benefits attributed to it, they stated that their facilities were not adequately prepared with the necessary resources for DSME implementation. These affirmations are in keeping with nurses in other regions. In Nigeria, Nwankwo et al. [10] showed in their research study where majority of the nurses indicated that they believed that DSME would reduce diabetes complications. Less than half believed their establishment was prepared to implement same. They cited inadequate qualified health personnel, educational facilities and economic resources as the major causes of unpreparedness. A suggestion of "strategic investment in human and material resources" was made by the authors. This was supported by Ezenwaka et al.[14] .

Section B: Discussion related to benefits of DSME

In this study, the CHNs were able to list a number of benefits of implementing DSME. Benefits such as clients would be more educated and empowered and better able to manage their disease. It would result in lowering blood sugars, encourage lifestyle changes where clients would participate in exercise activities, encourage proper dieting and increase compliance. These were reflected in the findings of the Power et al [29] which showed the DSME resulted in self-efficacy and empowerment, which increased health coping skills and simultaneously decreased diabetes-related distress and depression. Participants also indicated that the programme could reduce the stress of Diabetes in the country, a revelation which mimics a finding in a Hispanic and non-Hispanic community in another country. [15, 23]

Again in support of the findings of the current study regarding benefits of DSME, Klein [14] found that DSME resulted in significantly reduced A1c levels and life style changes and observe that most DSME programs relied heavily on rules and procedures to guide decisions about diet, exercise, and weight loss. These results are all in keeping with the CHNs postulate that DSME would result in more educated and empowered clients who will be able to better manage their diabetes.

There was only one study that supported the CHNs' views that DSME would result in financial benefits towards the clients and the state. Power et al (2015) indicated that DSME resulted in less hospital admissions and readmissions, which resulted in reduced health care costs due to lowered HbA1c. This would directly benefit the client and the state.

Section C: Discussion relating to limitation of DSME

In this current study the CHNs identified a number of limitations regarding implementing DSME. They reported that clients, relatives and health care workers may not be interested in participating in the educational programs for various reasons; they further articulated that a lack of cooperation between staff and patients can also hinder DSME. Furthermore, thy reported that there may be a lack of interest in health care providers, clients and family, because of deficiency in a good support mechanism for continuity of care [20].Further limitations that

were reported were that of unequipped medical team, lack of resources to follow through with DSME plans, low level of education on the part of the client to comprehend DSME requirements and language barrier. These findings are directly supported in the Nam et al. [20] when they found out in their study that culture and language capabilities influence the patient's health literacy and further highlights patient's financial resources, co-morbidities, and social support as affecting diabetes self-management.

Section D: Discussion related to the needs of the CHN, the client and community to facilitate effective DSME

In the current study, CHN reported that they will require a dedicated well trained staff, sufficient time to carry out DSME requirement, adequate medical supplies and equipment, educational material, funding to maintain the program, support staff such as podiatrist, nutritionist, psychiatrist, fitness instructor and pharmacy service for DSME implementation. They reported that the client will need family support, group support, supplies to care for self, access to educational material and food supplies. These findings are consistent with that of Steinsbekk et al. [17] which concluded that patients may need ongoing reinforcement to achieve lasting behavioral change and glucose control to more fully realize the full impact of diabetes education and to yield sustainable improvements in nutrition, exercise, and blood sugar control. The findings of the current study were further supported by Klein et al. [14]; Powers et al [29] and Sperl-Hillen et al. [31] .

In addition the CHN reported that the community will need diabetic support group, diabetic rehabilitation center, a clear understanding of DSME and what it entails, health education programs and trained personnel for DSME implementation.

Further the findings of the current study regarding time factor are supported in Krallet al. [30] where they found that time was a factor needed to provide the requirements of DSME, along with resources and guidance on expectations of DSME. In addition the nurses' shared their lack of confidence in providing accurate information on current therapies/tools and fear that patients will ask questions that they cannot answer, thus jeopardizing patient trust. They agreed that education was important and should be designed to assure safety after discharge of their client, focusing on "survival skills" related to hypoglycemia, medication, nutrition and blood glucose monitoring, and directing patients to outpatient DSME. With regard to education for clients they highlighted a number of ways that can be done and thought it should be patient centered.

Additionally, they advised that DSME be patient-centered, targeted, assessment-based and user-friendly to accommodate sicker patients and health literacy. The nurses recommended developing brief videos with iPads or similar technology to facilitate delivery of survival skill education. They gave ideas for supporting staff nurses as being, access to a dietitian, resource nurse and/or centralized diabetes educator for more complex cases, easily accessible, routinely updated, to-the-point web-based information and incentives for maintaining diabetes-related competencies.

In conclusion, the findings of this current research highlighted the perception of CHNs in Saint Lucia regarding implementing DSME in diabetes care management. It is clear that they appraised DSME as an effective strategy to care for T2DM clients. However in order for this Program to be implemented successfully they have identified perceived barriers and requirements that should be addressed before DSME can be implemented. The literature supported the findings of the current research.

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