

Article

An audit of diabetes self-management education programs in South Africa

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Significance for public health

Diabetes significantly contributes to the global burden of disease. This burden is especially felt in developing countries, where resources are limited and the health system simultaneously has to deal with communicable and non-communicable diseases. While there is a growing body of literature on the development and implementation of diabetes self-management education, nearly all programs originate from developed countries. Very little is known about the current state of diabetes self-management education in developing countries. By focusing on diabetes self-management education in Southern Africa, the current paper provides policy makers and decision makers in South Africa with information that will help decide on where and how to intervene with regard to diabetes self-management education. The paper also has relevance for decision makers from other developing countries by providing recommendations on diabetes policies and diabetes self-management education.

Abstract

Background: Diabetes is a significant contributor to the burden of disease worldwide. Since its treatment requires extensive self-care, self-management education is widely recommended, particularly in resource limited settings. This study aimed to review the current state of policies and implementation of diabetes self-management education (DSME) in South Africa, with a specific focus on cultural appropriateness.

Design and Methods: The audit involved a review of policy documents and semi-structured questionnaires with providers and experts in public and private health services. Forty-four respondents were interviewed. Documents were analysed with reference to the International Standards for Diabetes Education from the International Diabetes Federation. Data were entered and analysed in excel to give a description of the DSME programs and *ad hoc* interventions.

Results: Three guidelines for Type 2 diabetes and two for chronic diseases were retrieved, but none were specifically dedicated to DSME. Five structured programs and 22 *ad-hoc* interventions were identified. DSME is mostly provided by doctors, nurses and dieticians and not consistently linked to other initiatives such as support groups. Health education materials are mainly in English with limited availability.

Conclusions: DSME in South Africa is limited in scope, content and consistency, especially in the public services. A National curricula and materials for diabetes education need to be developed and adapted to the socio-economic context, culture and literacy levels of the target populations. It is recommended that DSME would be addressed in national policies and guidelines to guide the development and implementation of standardised programs.

Introduction

Diabetes mellitus (DM) is a significant contributor to the burden of disease worldwide, and its growing prevalence is a great concern for public health.¹ Recent estimates indicate that 382 million people are living with diabetes worldwide, and that by the year 2035 this number will rise to 592 million.² It is also estimated that about 77% of people with diabetes live in low- and middle-income countries where most deaths occur under the age of 60 years.^{2,3} As a result, many developing countries including South Africa are faced with the double burden of communicable and non-communicable diseases (NCDs).³

According to the International Diabetes Federation (IDF), there were nearly 3 million people with diabetes in South Africa in 2013, with a prevalence of 8.27% among the age group 20-79 years.² The rising prevalence of diabetes is largely due to economic development and urbanization which leads to changing lifestyles, thereby reducing physical activity and increasing the levels of obesity and the consumption of foods high in salt, fat and sugar.⁴ The prevalence of obesity is indeed very high in South Africa, where the rates of obesity and combined overweight and obesity (42% and 69.3%, respectively) are the highest in Sub-Saharan Africa.⁵

As diabetes requires extensive self-management related to diet, exercise and medication in order to prevent complications, self-management education and support are regarded as a critical element of treatment for all people with diabetes.⁶ As such, diabetes self-management education (DSME) is widely recommended and carried out where resources permit. However, despite the great variety of DSME programs that are currently available internationally, there is a paucity of information regarding educational interventions for the prevention of diabetes complications in developing countries.^{7,8}

The National Department of Health of South Africa has recently taken the initiative to re-engineer the organisation of Primary Health Care (PHC) in the country and to develop a National Health Insurance (NHI) system.⁹ A National Summit on the prevention and control of NCDs organized in 2011 resulted in the commitment to develop and implement different strategies to prevent and control NCDs through preventive, health promoting, curative, rehabilitative and palliative services at all levels.¹⁰ As such, it is important, to consider how DSME can be integrated in this new system, and to what extent the re-engineering of PHC provide a basis to develop and implement evidence-based programs for diabetes self-management.

Moreover, for DSME to be effective in a multicultural society like South Africa, it is required that both the educators and the content of programs be culturally sensitive.¹¹ Cultural sensitivity can be considered at two levels: surface structure and deep structure.⁷ Surface structure refers to matching the intervention materials and messages to observable *superficial* characteristics of a target population, such as familiar people, places, language, music, food and locations. Deep

structure requires an understanding of the cultural, social, historical and psychological forces that influence the target population.

This study sought to review the policies and guidelines presently available in South Africa with regard to DSME, and to characterise the existing DSME offered in both the private and the public health care services. The questions addressed in the audit were to establish what types of DSME programs are currently offered in different settings across the country, who implements them, what educational approaches are used, how the programs are structured, how accessible they are, what challenges are faced, and to what extent they are culturally sensitive. As such, the audit provides a snapshot of the current state of DSME policies and guidelines and of the implementation of DSME programs in South Africa.

Design and Methods

Study design and setting

An audit was conducted from March to June 2014 to explore DSME policies and programs across the seven Provinces of South Africa. The audit involved a document review of DSME policy and guidelines as well as interviews with health service providers and experts involved in diabetes service provision, management and research, in order to describe current DSME interventions.

Definition of terms

An intervention is referred to as a structured *program* when it has a clear definition, a specific target group, a planned structure, a clear objective, a defined timeframe, and a person/unit with formal program responsibility (Röthlin *et al.* Unpublished). For the purpose of this study, *ad-hoc* interventions were regarded as those interventions which include educational talks in the waiting area or spontaneous sharing of information during individual medical consultations without planned structure and defined time frame. A public health service is one that is provided by the national government, whereas a private health service is one provided by the private sector and is for profit making. Providers include nurses, doctors, health educators and experts refer to either researchers or people involved in the field of diabetes in government, universities or private services.

Sampling

Purposive, convenience and snowball sampling were used to select respondents aiming for diversity between public and private providers. Purposive sampling was used to include respondents from different health sectors, as differences were expected between private and public services. Convenience sampling was applied by asking the organisers of the 49th Congress of the Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) the permission to recruit participants attending this congress. Furthermore, respondents were recruited from different settings, including selected public and private facilities and non-governmental organisations (NGO) using snowball sampling. The first author (LD) contacted Heads of the Provincial Health Departments of all provinces of South Africa and asked to be referred to a focal person for chronic diseases in each Province. Provincial focal persons were interviewed and referred the researchers to relevant facilities and other NGO focal people in the area. Data were only collected from Provinces who gave approval and from individuals who gave informed consent to participate.

Data collection

Policy and guideline documents for the review were accessed via the

website of the National Department of Health.¹¹ To avoid missing relevant documents, respondents were asked for any available documents and copies were collected if available. Only documents relating to Type 2 diabetes were included for document analysis.

For the data collection from service providers, experts and researchers, two questionnaires were used. The questionnaires were adapted from the Global Diabetes Survey (GDS), which is a tool to collect data on diabetes care quality on a yearly basis, developed and validated via a multiple Delphi process.^{12,13} The provider questionnaire collected information about existing DSME programs in terms of the type of programs, providers, target groups, educational approach, and challenges faced. The expert questionnaire collected information regarding DSME policy, accreditation of DSME interventions by accrediting bodies (standardising bodies) and suggestions for policies and guidelines. The questionnaires were mostly self-administered but in a few cases (5 interviews) they were interviewer administered. Additional notes were taken during the interviews.

Data management and analysis

Data from the documents were extracted using the International Standards for Diabetes Education (ISDE) developed by the International Diabetes Federation. These standards have been developed and revised based on experiences from diabetes educators in both developing and developed countries, and aim to support policy makers worldwide to develop diabetes education. They provide a benchmark against which the quality of education delivered can be evaluated.¹⁴ The ISDE were used by two authors (LD and MH) to independently extract information on the content of DSME in the national guidelines in order to establish the adequacy of these documents in South Africa in terms of structure, process and outcome standards. An agreement of 90% was achieved between the authors and through further discussion a consensus (100% agreement) was reached. Questionnaire data were entered and analysed in excel to give an overview of the current status of DSME in private and public services of South Africa.

Ethics

The study was approved by the Health Sciences Research Ethics Committee of the University of Pretoria (54/2014) and the Provincial Research Ethics Committees of each province in the public sector. Respondents gave written informed consent and anonymity and confidentiality of their responses was assured.

Results

Distribution of participants across provinces

Forty-four respondents completed the questionnaires; 27 providers (7 from private, 4 from NGOs and 16 public) and 17 experts. Data was collected in all provinces except for Eastern Cape and Limpopo's public sector where no permission was granted. Table 1 shows number of respondents per province with Gauteng having the highest number of respondents.

Policies and guidelines with regard to diabetes self-management education

No policy documents were identified with regards to DSME specifically. Three guideline documents on Type 2 diabetes were found: The Updated Management of Type 2 Diabetes in Adults at Primary Care Level, released in 2014;¹⁵ The National Guidelines for the Management of Diabetes Type 1 and 2 in Adults at Hospital Level, released in 2005;¹⁶ and *The 2012 SEMDSA Guideline for the Management of Type 2 Diabetes (Revised)*.¹⁷ The first two documents were obtained from the National

Department of Health. In these three documents, diabetes education was minimally covered. The guidelines included information on structure and process standards; however, this information was not comprehensive. As shown in Table 2, it appears that the 2014 document from the National Department of Health was derived using the 2012 SEMDSA guidelines as the information included is almost the same. The 2005 document covered the least amount of information on DSME compared to the other two guidelines.

To understand DSME in the context of chronic disease management in South Africa, the *Integrated Chronic Disease Management (ICDM) Manual (undated)*¹⁸ and the *Primary Care 101* guidelines were also taken into consideration.¹⁹ The ICDM is a model of care for chronic diseases that is being implemented by the National Department of Health of South Africa. The Primary care 101 is currently being implemented as part of the ICDM in primary care. The disease categories currently being addressed in this model are hypertension, diabetes, chronic obstructive pulmonary disease, asthma, epilepsy, mental health HIV/AIDS, tuberculosis (TB) and multi-drug resistant TB. The model contains a self-management component which aims to empower individuals to take responsibility for their illness through understanding the necessary preventive and promotional actions required to decrease complications and multiple visits to the facilities. The expected outcome is to create an informed, motivated and adherent patient.

According to this model, trained Community Health Workers (CHWs) are mandated to provide health education to patients during home visits. Health education and promotion strategies are applied at the individual, family and community level to reduce the risk factors for developing chronic diseases and prevent complications from the existing condition(s). The health education sessions include, but are not limited to: healthy eating, active living through appropriate exercises, decrease in alcohol intake, reduction in tobacco, snuff, alcohol, salt and risky sexual behaviour.

The primary care 101 guideline document is designed in such a way that for each chronic disease,¹⁹ it gives some educational information which the provider should give to the patient. For diabetes the provider is advised to encourage the patient to adhere to medication, educate patient on recognising and managing hypoglycaemia, and to care for their feet.

In their responses to the questionnaires, experts and providers made recommendations that could be included in policies and guidelines for implementation of DSME. These include environment related policies such as subsidization of healthy foods and support for people with diabetes in the work place. To support patient adherence to insulin use, policies could mandate patients to bring back an empty insulin pen to qualify for renewal of insulin prescription. Furthermore, guidelines could also include dietary recommendations appropriate for poor communities in order to support patients to adhere to dietary recommendations. Guidelines could consider more attention to the actual implementation of DSME, support for educational programs, establishment of one standard-assuring body for diabetes education and also consider recognition of the training of providers in DSME.

Description of diabetes self-management education programs

Of the 27 respondents who answered the questionnaire on interventions, 5 reported on structured programs and 22 reported on *ad-hoc* education interventions. Sixteen of the 27 programs are in the public services whilst 11 are in the private services and NGOs. Respondents reported that few interventions (37%) are accredited by a professional body [Diabetes Education Society of South Africa (DESSA), the International Diabetes Federation (IDF), the United Kingdom Diabetes Association and Center for Diabetes Education (CDE), the Provincial Department of Health and SEMDSA].

Of the 5 programs that are structured, three are in the public services

and two in the private services. All the programs are offered as initial education interventions and have a clear start and an end with a duration of two days to eight months (Table 3). At two facilities the same program is offered. Twenty-two services offer *ad-hoc* education. Of these, 13 are in the public services and nine in the private sector. Most DSME interventions (15 of 22) are incorporated into the ICDM, whereby the diabetes patients are grouped with those with other chronic illnesses for educational purposes. This education mostly takes place in the facility waiting area or club rooms, or, in the case of individual counselling, sometimes during medical consultations with the providers. DSME interventions in the public sector are free of charge. In the private sector they are included in the consultation fee.

Providers

For both structured programs and *ad-hoc* education, different combinations of providers are employed. Most providers are health professionals, with physicians and dietitians being the most common. Health promoters are the only non-professional category mentioned (Figure 1). Respondents also mentioned that training is essential for providers and that specific diabetes-related training courses are necessary, including the ones provided by DESSA or CDE.

Target population

In structured programs, the target population are patients with either Type 1 or 2 diabetes and other chronic diseases. Only one program addressed children and adolescents with Type 1 diabetes. The *ad-hoc* interventions in the public services mostly target adult patients, while children are referred to specific facilities. In the private service all age groups are addressed. Educational interventions offered in the private services also address gestational diabetes, while in the public service these patients are immediately referred to the special maternity care clinics. In both structured and *ad-hoc* interventions, education is designed for patients and their families or their peers. The majority of the *ad-hoc* interventions were done in community based primary care, diabetes special care and hospital settings. Of the structured programs, 3 were offered in community based primary care, one in diabetes special care, and one in a non-clinical setting.

Program content

Content analysis of the structured and *ad-hoc* interventions was done based on the self-care behaviour topics included in the American Association of Diabetes Education (AADE)²⁰ (*i.e.*, healthy eating, staying active, taking medication, monitoring of blood glucose, problem solving, reducing risks and living with diabetes). In both the structured programs and *ad-hoc* interventions, the content of the educational

Table 1. Number of respondents from each province.

Province	Provider questionnaire	Expert questionnaire	Total respondents
Gauteng	8	9	17
Mpumalanga	4	1	5
North West	3	1	4
Northern Cape	1	1	7
Free State	3	1	4
Western Cape	4	0	5
KwaZulu Natal	2	3	7
Limpopo	2	1	3
Eastern Cape	0	0	0
Total	27	17	44

activities varied considerably. Table 4 shows the different contents of education for both structured and *ad-hoc* interventions. As this table shows, across programs healthy eating, physical activity and self-monitoring of blood glucose were most often addressed, while glucagon administrations, self-measurement of blood pressure and dealing with the legal aspects of the disease were least often addressed.

Educational approaches

In the structured programs, education is offered in planned group sessions with professional facilitation and sometimes with additional individual and self-help sessions for patients with poorly controlled diabetes. A structured written curriculum for each program is available and two of the programs use the *I change 4 Health* lifestyle change materials developed for patients with non-communicable diseases.²¹ One program has a website available for patients. The *ad-hoc* educational interventions are offered in groups in the waiting area and during individual consultation sessions with the provider. Some *ad-hoc* educational interventions had written guidelines to which provider could refer for information. Respondents reported using pamphlets and booklets which are mainly written in English. In most cases these materials are supplied by pharmaceutical companies free of charge but are not always available. According to the respondents (93%) from both structured and *ad-hoc* interventions, education is accessible to people with low levels of literacy through the use of the local language, practical demonstrations, pictures and visual aids and the encouragement of family involvement. However, deep structural aspects of culture including individual needs assessment are rarely addressed.

Evaluations of programs

Two of the five structured programs were based on a randomised controlled trial (RCT) that showed the program to be cost-effective in the South African context.²² Two other programs are in the process of being evaluated: one using a randomised controlled trial, and another

using a retrospective observation study. The remaining program was never evaluated. None of the *ad-hoc* educational interventions have ever been evaluated.

The experts' responses to the questionnaires revealed that core educational principles exist on paper, yet their implementation is not guaranteed. In terms of the perceived effectiveness of DSME programs, most experts gave a score between 5 to 7 on a scale of 1-10 (with 1 being not at all effective *versus* 10 being very effective), indicating an intermediate effectiveness. When asked to identify the aspects of DMSE that need improvement, the experts mentioned the need to develop structured patient education programs and a need to train personnel in chronic disease education. The introduction of chronic disease education in schools as part of a school lifestyle and wellness was also suggested.

In their response to questionnaires, providers identified a range of problems that affect the delivery of DSME. One problem concerned inadequate finances, which results in a shortage of staff, long working hours, and lack of time and space for patient education which leads to low prioritisation of DSME. A second problem is the lack of recognition for staff after diabetes training, and a shortage of teaching materials to give to patients. A third issue concerns the patients, who are said to be ignorant and non-compliant. Abuse of services and misconceptions surrounding diabetes regardless of patient education was also mentioned. A further problem is related to poverty and the difficulty patients have in adhering to diet recommendations due to food insecurity.

Discussion

This audit aimed to collect information on policies and the nature of existing DSME programs in South Africa. It was revealed that although there is currently no policy specific to DSME in South Africa, DSME is

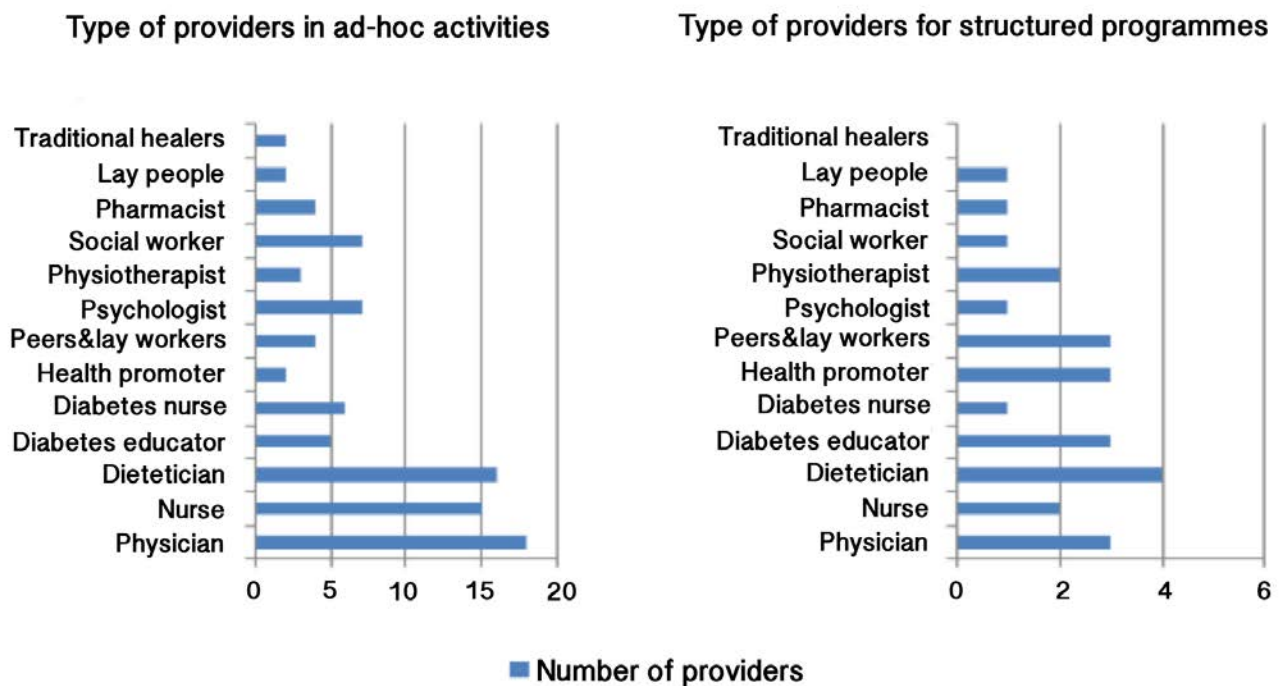


Figure 1. Type of providers in diabetes self-management education.

Table 2. Diabetes self-management education information extracted from guidelines using the International Standards for Diabetes Education (ISDE).¹⁴

Domains in ISDE ¹⁴	Criteria set by the ISDE	Updated guidelines, 2014 ¹⁵	SEMDSA guidelines, 2012 ¹⁷	Updated guidelines, 2005 ¹⁶
Structure standards	<p><i>Organisational support:</i> there is evidence of organisational/institutional support for DSME as an integral part of diabetes care</p> <p><i>Coordination:</i> one person responsible for the organisation and administration of DSME services to ensure that the process and outcome standards are met</p> <p><i>Physical space and equipment:</i> the quality and availability of physical space and educational resources affect learning and are based on individual/community needs</p> <p><i>Advisory committee:</i> an advisory committee ensures that the views and values of all stakeholders are represented in the ongoing planning and delivery of DSME</p> <p><i>The team and team work:</i> multidisciplinary teamwork and communication are evident among those providing DSME and diabetes care services</p>	<p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p>	<p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p>	<p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>All health professionals, lay health workers, traditional healers & complementary health professionals</p>
Process standards	<p><i>Professional skill and continuing education:</i> a) personnel involved in DSME have a sound clinical understanding of diabetes, and are knowledgeable about teaching and learning methods and diabetes care; b) the competence and performance of personnel involved in DSME are reviewed at least annually and an individual learning and development plan implemented to strengthen knowledge, skills and attitudes; c) professional DSME personnel are appointed based on demonstrated competences not on a rotational basis</p> <p><i>Curriculum:</i> Diabetes education covers topics based on individual assessment and fosters the acquisition of knowledge, skills, behaviours and coping strategies that are needed for optimal self-management of diabetes</p> <p><i>Support systems:</i> a) Strategic partnerships and referral pathways are developed in order to improve communication and the consistency of services among healthcare professionals, and to maximize the impact of diabetes resources; b) Ongoing self-management education and support are accessible to people with diabetes after the completion of initial DSME.</p> <p><i>Community assessment:</i> The DSME service develops based on an ongoing assessment of the needs of the population it serves.</p> <p><i>Individualised plan:</i> Plans for individual diabetes education and diabetes education programmes are learner-centred and subject to ongoing review and modification.</p> <p><i>Implementation:</i> a) The implementation of DSME is learner-centred and facilitates cognitive learning, behaviour change, healthy coping and self-management, and is extended to families, supporters, carers and communities where appropriate; b) DSME is evidence-based and provided in a professional and ethically sound manner.</p> <p><i>Access:</i> a) DSME services will be recognized by and accessible to the local community; b) The DSME service leadership and team members seek strategic alliances and partnerships with relevant community services in order to increase accessibility, and advance DSME and DSMS; c) Follow-up and DSMS are accessible as needed and recommended as part of continuing education, behavioural goal-setting and action-planning, and/or reinforcement.</p> <p><i>Evaluation:</i> The effectiveness and quality of the DSME service are assessed annually, linked to outcomes, and reviewed and revised on the basis of this assessment.</p>	<p>Not clear: trained educators mentioned to provide education</p> <p>Only topics outlined</p> <p>Not included</p> <p>Not included</p> <p>An integrated approach to education is utilised, recognising and acknowledging the different needs of the patient, family and/or caregiver</p> <p>An evidence-based structured education program on diabetes self-management is offered to all patients at the time of diagnosis, and consolidated at regular intervals thereafter</p> <p>Not included</p> <p>A regular audit of the program, and its effect on outcomes, is advised</p>	<p>Not clear: providers to be trained in motivational interviewing</p> <p>Only topics outlined</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>An evidence-based, structured education program should be offered to all patients at the time of diagnosis, and consolidated at regular intervals thereafter</p> <p>Not included</p> <p>A regular audit of the program and its effect on outcomes is advised</p>	<p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p> <p>Not included</p>

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Table 2. Continued from previous page.

	2014 ¹⁵	2012 ¹⁷	2005 ¹
Outcome standards	Not included	Not included	Not included
<i>Knowledge:</i> People with diabetes understand the effects of diabetes, treatment modalities, management of the behavioural, psychosocial and clinical aspects of diabetes, and the significance of maintaining a healthy lifestyle in order to reduce the risks for diabetes-related complications.	Not included	Not included	Not included
<i>Application of knowledge:</i> People with diabetes and those at risk for diabetes make informed decisions and take deliberate action towards healthy living. These decisions occur in the context of their own values, socio-economic needs and resources, and desired quality of life.	Not included	Not included	Not included
<i>Clinical outcomes:</i> a) The physical, psychological, and emotional health of the person with diabetes is improved; b) The person with diabetes collaborates with clinical care providers to define problems, set priorities, establish goals, create action and treatment plans, and solve problems.	Not included	Not included	Not included
<i>The community primary prevention:</i> Communities are aware of risk factors for diabetes and its potential complications and actions that may delay their onset.	Not included	Not included	Not included
<i>Community support:</i> Communities are aware of the different types of diabetes and the needs of and support available for people living with diabetes.	Not included	Not included	Not included

DSME, diabetes self-management education.

mentioned in national guidelines on diabetes. However, much needs to be done in terms of developing and implementing guidelines for DSME, in order to reach the International Standards for Diabetes Education.¹⁴ As these standards are designed to provide a framework to establish or further develop DSME, failure to meet these standards results in a poor implementation of DSME.

A first shortcoming revealed by this audit is the absence of well-structured programs for DSME. DSME is often delivered on an *ad-hoc* basis in the waiting area or individually during consultation with the provider. Individual *ad-hoc* education has its own challenges, such as the fact that the actual delivery of the education depends on the available time of the provider,²³ or that patients receiving DSME in the waiting area are disturbed by noise, lack of privacy, and other factors that make it difficult to concentrate on the content. The *ad-hoc* nature of DSME also results in individual patients being exposed to an arbitrary choice of topics, which may not result in the behaviour change that is required.

On the other hand, it is possible to combine *ad-hoc* counselling with structured group education. A model that combines behaviour change counselling with ad hoc guidance organised around 5 As (Assess, Advise, Agree, Assist and Arrange) has been proposed and has shown to be effective.²⁴ Although the implementation of this 5-As model is currently limited, it could be used by primary care physicians in their consultations with patients.

The providers who are responsible for DSME in South Africa are mostly professional health care providers, and only a small proportion are non-health professionals. This is contrary to the ICDM model, which recommends that health education should mainly be provided by CHWs and health promoters. There was no mention of CHWs as providers in the interviews. According to a recent systematic review, it is advisable that in resource poor settings peers and CHWs are trained to provide DSME, while professional staff like nurses takes up supervisory and training roles for the non-professionals.⁷ However, one should note that relying more on CHWs also has its limits and is not a panacea, especially when these are not sufficiently trained. An extensive Cochrane review revealed limited evidence of trained lay health workers on providing effective DSME, however, this could still be part of the solution for developing countries.²⁵

A second shortcoming emerging from this audit is that there is no continued education for providers and a lack of recognition for providers after diabetes training. Despite the existence of national guidelines on diabetes education, some providers reported that they were not aware of these, which suggests a lack of on-going training and refresher workshops that are crucial for providers. This confirms the findings from a previous study, indicating that current training in behaviour change counselling for primary care providers is very limited.²⁶ Health professionals need access to continued education and training to stay updated on new developments and to boost their morale and professional role.²³ Moreover, a lack of a standardised written curriculum, physical space and time presents a challenge for the implementation of DSME programs, as has been suggested by previous research mentioning the lack of physical space in facilities as hindering DSME interventions.^{23,26,27}

A third point showing from this audit is the lack of cultural adaptation of DMSE and the absence of the patient perspective. Whereas diabetes guidelines recognise and acknowledge the different needs of patients, family and caregivers, there is very little evidence of this taking place in practice. Although local languages are used to communicate with patients and pictures and visual aids are used (surface structure), there are no individual needs assessments (deep structure), and most written materials are only available in English. Providers requested practical dietary recommendations for people in poverty stricken areas as the current recommendations are inappropriate. This shows that the cultural sensitivity of existing DSME interventions still needs

to be improved. For diabetes education to be effective in multicultural societies, both the educators and the content of programs should be culturally sensitive.^{7,8,28} Therefore, self-management curricula should be developed and adapted to the culture and needs of the patients. The patient education component in the Primary Care 101 document could be expanded in order to provide advice to providers.

A fourth shortcoming is the lack of evaluation of DSME programs. It is important in health promotion that programs be evaluated in order to contribute to the evidence base.^{29,30} Although the national guidelines on diabetes state that evidence-based structured self-management must be provided to patients and that a regular audit should be performed, this was not the case. Most DSME interventions, except for the two structured programs derived from the RCT, have not been evaluated, which makes it impossible to consider their effectiveness.

While this audit is the first of its kind to describe current policies

and guidelines with regard to DSME in South Africa, and to consider the way in which DSME interventions are implemented in different settings across the country, we are aware of its limitations. Firstly, since non-randomised sampling was used as a method to select interventions for inclusion in the study, it is possible that we have missed some interventions. Furthermore, because of difficulty in obtaining ethical clearance from some facilities and authorities, and due to limited resources, some potentially relevant documents and interventions may have been missed. Thirdly no observation of interventions was carried out, which precludes the possibility of triangulating the results with what respondents reported. Nevertheless, given the recurrent findings and the high degree of consensus with regard to the information derived from the sources that were consulted, we believe that this audit provides a useful snapshot of the current policy and practice with regard to DSME in South Africa.

Table 3. Timeframes of structured programs.

Name of program	Duration	Sessions, n.	Duration of each session	Period between sessions
Five steps to self-care (NGO-Gauteng)	8 months	32	30 min - 2 hours	1 week
Diabetic Lifestyle Education Collaboration & Action (D-LECA) (Woodstock, public facility, Western Cape)	4 months	4	2-4hours	1 month
D-LECA (Lotus river, public facility, Western Cape)	4 months	4	1-2 hours	1 month
Lifestyle management + training for T2 diabetes (Public Hospital- Gauteng)	6 weeks	6	4 hours	1 week
Youth with diabetes weekend camps (Youth with Diabetes, NGO- Gauteng)	2 days	5	30-60 minutes	Annual 2 days event

Table 4. Content included in programs and ad-hoc interventions.

Topic based on AADE ²⁰	Sub-topic	Ad-hoc	Structured
Healthy eating	Meal planning	21	4
	Food labelling and interpretation	17	4
	Weighing	16	4
	Carbohydrates counting	13	3
Physical activity	Developing appropriate activity plans	21	2
	Increase frequency, duration and intensity	19	4
Self-monitoring of blood glucose	Self-monitoring of blood glucose technique (skills)	22	5
	Recording of blood glucose values	21	5
	Equipment use and care	18	3
Taking medication	Preparation, technique and administration	20	5
	Recognition, treatment & prevention of low blood glucose	20	5
	Safe handling and disposal of equipment	18	4
	Dose adjustment	16	3
Problem solving	Hypoglycaemia treatment	22	5
	Use of blood glucose data to determine appropriate actions	21	5
	Glucagon administration	7	2
Reducing risks	Self-management of blood glucose (knowledge)	19	5
	Smoking cessation	20	3
	Maintaining personal records	19	4
	Foot exam	19	3
	Staying in contact with diabetes care professionals	18	4
	Support in searching for further contact and help	14	4
	Self-measurement of blood pressure	10	2
Living with diabetes	Goal setting/individual targets	21	4
	Problem solving	20	4
	Coping strategies	18	4
	Action planning	18	3
	Understanding own clinical picture	19	2
	Self-efficacy	20	1
	Dealing with depression	15	1
	Dealing with legal aspects of the disease	10	0

Conclusions

Diabetes self-management education is rarely adequately addressed in national policies and guidelines in South Africa, and much work still needs to be done for DSME in the country to reach international standards. At present, DSME is mainly offered on an *ad-hoc* basis, and only a few structured programs exist. For both *ad-hoc* and structured interventions, health professionals are the main providers. Many barriers exist to develop and implement more structured DSME. These include, but are not limited to, lack of time and space, lack of finances, and lack of educational resources in other languages than English. It is recommended that these points would be addressed in national policies to guide the development and implementation of standardised, more culturally sensitive and more effective DSME programs.

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