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Development of a health dialogue model for patients with diabetes: A complex intervention in a low-/middle income country

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ABSTRACT

Type 2 diabetes is reaching epidemic proportions in a low-/middle income country such as South Africa, where most patients are managed in the public health sector with limited resources. Poor knowledge, negative attitudes and unhealthy practices are common, highlighting the need for healthcare providers to adapt health communication strategies appropriately. The current study aimed to develop a health dialogue model by applying a multiple-methods design informed by the United Kingdom Medical Research Council's guidelines for the development and evaluation of complex interventions. Guided by this framework, four separate but inter-related studies were conducted to establish the active components of health dialogue. Participants included patients with type 2 diabetes from a variety of public healthcare settings and healthcare providers who provide services to them. The findings from the four primary studies were then synthesised at a two-day workshop during which three focus areas emerged, including the community, the patient and the healthcare provider. Community awareness could be raised by delivering key messages in the native tongue of patients through combinations of traditional folk media such as drama and storytelling in the waiting rooms of health centres. Self-management of patients could be promoted by active participation of patients in tailored health communication using peer support and the use of mobile health devices. Finally, training platforms for healthcare providers should include in-service training through interactive workshops. Our culturally sensitive health dialogue model has the potential to improve adherence to treatment, leading to greater satisfaction and consequently improved health outcomes.

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder with a rising worldwide prevalence (World Health Organization., 2016), affecting all age groups, nationalities and classes (Hanson, Gluckman, Ma, Matzen, & Biesma, 2012; Kiberenge, Ndegwa, Njenga, & Muchemi, 2010). The International Diabetes Federation (IDF) (2015) estimates that approximately 415 million people worldwide live with diabetes and the disease affects one in eleven adults. Should this growing concern not be addressed it is projected that one in every ten adults will be living with the disease by the year 2040, and most of these will live in low-and middle income countries (LMICs).

The majority of patients with T2DM are adults from the economically active population (who work and earn a living) in LMICs (Narayan, Ali, & Koplan, 2010; Tunceli et al., 2005). These countries have a lower gross national income than high-income countries and present with limited resources, personnel, infrastructure and technologies (Kreps & Sivaram, 2008).

South Africa, classified as a middle-income country, reflects the same prevalence of T2DM amongst economically active adults (Narayan et al., 2010; Tunceli et al., 2005). Not only is the prevalence of T2DM in South Africa expected to rise (World Health Organization, 2014), but also the percentage of deaths attributable to T2DM (Stats SA., 2014). T2DM is now the leading natural cause of death amongst females and second amongst both sexes and all ages (Stats SA, 2017). These patients are mainly managed within the South African public health sector (Harris et al., 2011).

The focus of the public health sector is to improve the health status of the entire population and to contribute to the government's vision of "a long and healthy life for all South Africans" (South Africa Department of Health, 2010, p. 3). Consequently, one of the objectives of the Negotiated Service Delivery Agreement of the South African Department of Health is "Increasing life expectancy" (South Africa Department of Health, 2010, p. 3). For this vision to be realised, the rise in diabetes needs to be curbed (Chan, 2016).

In South Africa, as elsewhere in the world, the increasing prevalence of T2DM may be attributed, at least partly, to negative attitudes and unhealthy practices related to the self-management of T2DM (Ng et al., 2012), with beliefs about the expectations and behaviours of others influencing health behaviour (Ajzen, Joyce, Sheikh, Gilbert, & Cote,

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2011) of T2DM. The theory of planned behaviour, predicts that behaviour takes attitudes towards the behaviour, subjective norms and perceived behavioural control into account. This theory can be applied as a vehicle to understand these influential factors as well as the interactions that exist between them (Ajzen, 1991). It is important that healthcare providers consider the patient's point of view (Boini et al., 2010), as it influences their health behavior and thus healthcare providers should position and adapt health communication strategies appropriately (Rensburg & Krige, 2011). A collaborative, interactive relationship between the patient and healthcare provider can encourage effective communication (Shue, O'Hara, Marini, McKenzie & Schreiner, 2010).

Tomaselli and Chasi (2011, p.17) define *dialogue* as a "two-way, interactive and participatory" process, comprising valued aspects such as mutual respect, humility and trust. This approach is strongly based on the participatory paradigm and influenced by theorists like Paulo Freire (Smith, 2002), in that dialogue is based on the sharing of knowledge rather than a top-down approach from a source to a receiver. In other words, if health dialogue with the patient is effective, the patient becomes actively involved in his/her care and shares in the decision-making process leading to improved adherence to treatment, greater satisfaction and consequently improved health outcomes (Barclay, Blackhall, & Tulsky, 2007; Shue, O'Hara, Marini, McKenzie, & Schreiner, 2010).

Cultural and ethnic diversity in health dialogue is a source of complexity, particularly in LMICs. Healthcare in South Africa often lacks effective, culturally appropriate health communication strategies to address concerns in order to encourage awareness, early intervention and self-management. Practices of patients with chronic diseases such as T2DM in urban and rural South African communities in the Free State Province leave much to be desired and relevant interventions to remedy this situation are long overdue (Groenewald, Van Wyk, Walsh, Van Zyl, & Van der Merwe, 2009; Van Zyl et al., 2010; Tesfaye & Gill, 2011).

1. The study

In order to design an effective health dialogue model between healthcare patients with T2DM in the Free State Province, the framework for complex interventions, developed by the UK Medical Research Council was applied (Medical Research Council & (MRC), 2000), with a feasibility study planned as follow-up.

This article reports on the development phase of a study conducted between 2014 and 2016 to develop a health dialogue model for patients diagnosed with T2DM attending identified public health services in the Free State Province. The complexity of such an intervention required careful planning of the development phase, which finally manifested in four primary studies and a two-day workshop during which a multi-professional expert research team synthesised the data from the mentioned studies to design a health dialogue model (referred to as the HDM Diabetes study).

2. Aims

Although each of the primary studies in the multi-phase research programme had a specific aim, the findings were synthesised to develop a health dialogue model for adult patients with T2DM. In Fig. 1 the four primary studies that culminated in a health dialogue model are depicted.

The *concept analysis* aimed to develop a definition for health dialogue with a clear theoretical base, in order to promote consistency in the use of the concept and to understand the underlying key characteristics of the concept (Reid, 2015). The aim of the *integrative review* was to synthesise the best available evidence of communication strategies used to accomplish effective health dialogue in adults with chronic diseases in LMICs from the year 2000 to 2014 (Pienaar, 2016).

Two *knowledge, attitude and practice (KAP) studies* were conducted: one to assess the diabetes-related KAP of adults with T2DM in the Free State (Le Roux, 2016), and the other to investigate the KAP of healthcare providers caring for such patients (Hassan, 2016). A *qualitative study on perceptions* explored the perceptions of patients diagnosed with T2DM regarding health communication strategies, in order to establish how health messages should be conveyed to them, what techniques they preferred and which aspects in health messaging acted as change agents (Nyoni, 2016).

The findings of the mentioned studies were synthesised during a two-day workshop aimed at designing a *health dialogue model* for adult T2DM patients within the South African context. This concluded the development phase of the project. In a future study, the feasibility of the model will be tested during a health dialogue intervention.

3. Design

A multiple-methods design informed by the guidelines for the development of complex interventions (Medical Research Council, 2000) was applied. Both qualitative and quantitative methods were implemented during the primary studies to identify the best available evidence, grounding the study within the theory of planned behaviour (Medical Research Council, 2000; Ajzen et al., 2011). More detail related to the primary studies that formed part of the development phase are included in the following section:

4. Health dialogue: a concept analysis

The concept analysis was conducted in stages, following the stepwise structured process of Walker and Avant (2011) including literature between 2000 and 2013. Health dialogue was defined as an equal and symbiotic health relationship between the patient and the healthcare provider, with reciprocal health communications geared to reaching a recognised health objective via a health message. In this context, the outcome of health dialogue leads to an improved health outcome (Reid, 2015). A conceptual map of health dialogue ensued from the data analysis (Walker & Avant, 2011) comprising antecedents, characteristics, empirical referents and consequences (see Fig. 2).

This conceptual map served as a guiding standard in developing a health dialogue model for patients with diabetes in the Free State.

5. Integrative review: communication strategies for adults with Chronic Disease used in LMICs

A focused review question based on the PICO format (*PICO = population, intervention, comparison intervention, outcome)* guided the review process. The seven steps of conducting an integrative review suggested by Higgins and Green (2006) were applied. The following questions were asked: "Which communication strategies are used during effective health dialogue among adults with chronic diseases?" The effective communication strategy elements, were related to how, when, what, where and by whom health communication strategies were used.

Data analysis included thematic summaries (*cf.* Gough, Oliver, and Thomas, 2012; Snilstveist, Oliver, and Vojtkova, 2012). Consequently, the data were analysed qualitatively and coded in terms of an analytical framework based on the review question and sub-questions. The synthesis process led to the following concluding statements related to the review question:

- How? A variety of strategies may be used to accomplish effective health dialogue in adults with chronic disease in low- and middle-income countries.
- When? Frequently scheduled communication strategies are recommended.
- What? A communication strategy that provides focused and specific

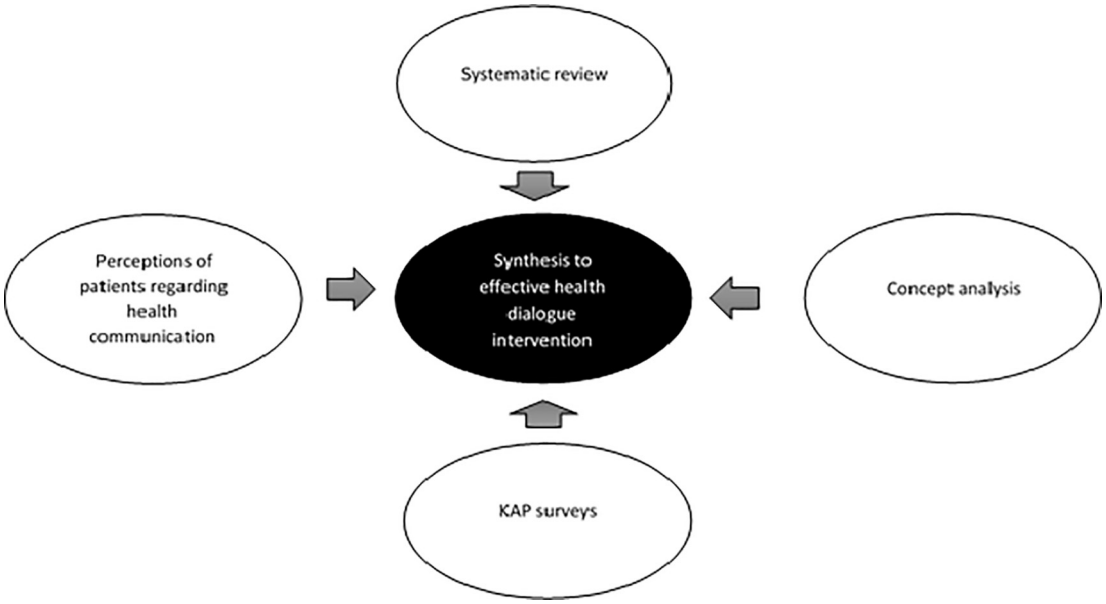

Fig. 1. Four primary studies conducted in the development phase, culminating in a health dialogue model.

information to the individual or group should be used.

- Where? Communication should preferably take place in a convenient and private setting.
- Who? Communication should be provided by trained lay persons and/or healthcare professionals, as well as automated computer systems (Pienaa, 2016).

6. Diabetes-related knowledge, attitude and practices (KAP) of adults with T2DM, as well as of healthcare providers caring for diabetic patients

The diabetes-related KAP of adults with T2DM comprised two quantitative observational studies. The populations included (i) adult patients older than eighteen years with T2DM attending facilities in the Free State public health sector and (ii) two groups of healthcare providers, namely nurses and community health workers, providing care to T2DM patients.

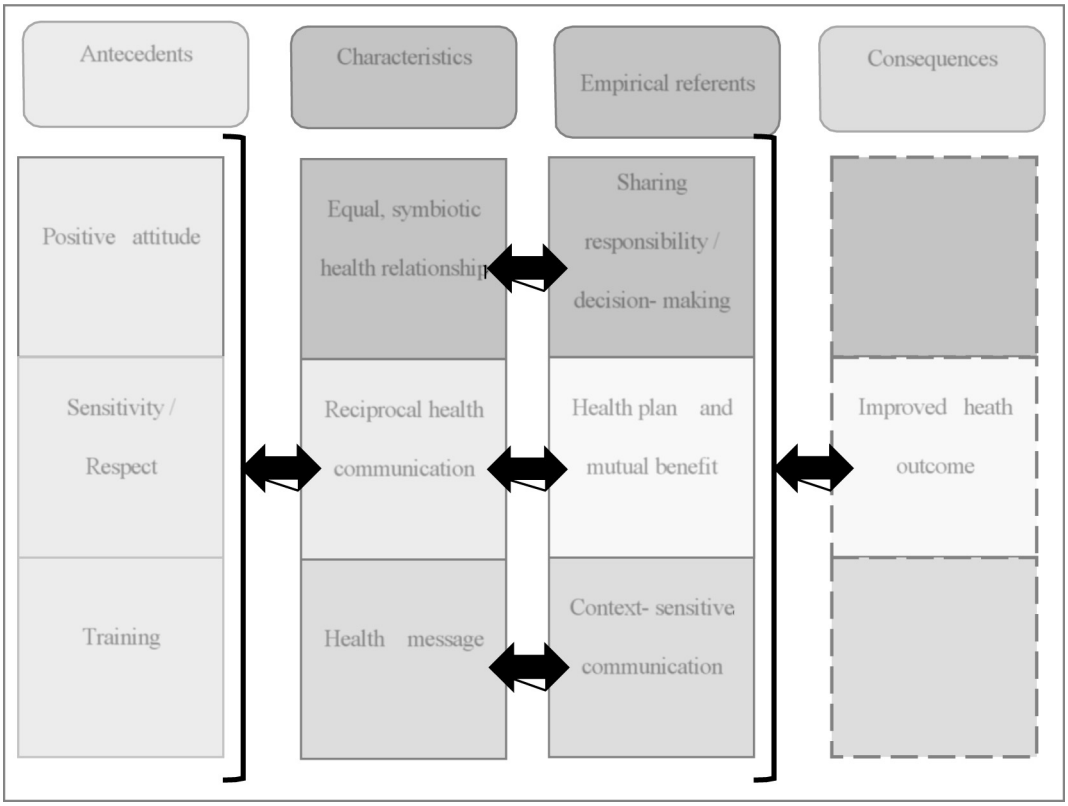

Fig. 2. Conceptual map of health dialogue: Antecedents, characteristics, empirical referents, and consequences (Reid, 2015).

Sampling followed a stepwise process. All community health centres (N = 10) within the five districts of the Free State were included and primary health clinics (N = 12) in one district, Mangaung Metro, were selected through stratified sampling techniques. The strata were the three main towns in the Mangaung Metropolitan Municipality, namely Bloemfontein, Thaba Nchu and Botshabelo. The primary health clinics were selected from the Mangaung Metro district, because this district has more primary health clinics than other districts in the Free State (Ataguba et al., 2012). Convenience sampling was employed. A total of 255 adult patients and 60 nurses and 46 community health workers were included. A questionnaire adapted from the South African Diabetes KAP questionnaire (Dinesh, Izham, Vijay, Pranaya, & Subish, 2012) was applied to collect information about demographics and associated factors, quality of life and KAP, anthropometry (BMI & waist circumference) and perceived care (Hassan, 2016; Le Roux, 2016).

The majority (64%) of adult patients as well as nurses (61.1%) and community health workers (60.8%) were Sesotho speaking. Only 12.6% of the adult patients had completed high school and 9.8% were illiterate. By contrast, 63.0% of the community health workers had completed high school, and all of the nurses had at least a post-school diploma. Answers to questions related to knowledge of diabetes were scored by totaling the number of correct answers. For patients and community health workers the knowledge scores could range from 0 (all incorrect) to 22 (all correct) and for nurses scores could range from 0 to 36.

For patients positive, negative, and neutral practices were identified, so that scores could range from −10 (all negative practices) to +10 (all positive practices). Items for the healthcare providers only assessed whether they were doing what they were required to do according to the South African guidelines for the management of patients with diabetes (South Africa Department of Health, 2014), and so items were scored 0 for non-compliance and 1 for compliance. Because of the different roles, scores ranged from 0 to 38 for community health workers and from 0 to 16 for nurses.

The same 18-item attitude scale was used for all three groups, but because attitudes are subjective, the scoring was conducted in such a way that responses indicating a positive attitude would be given a score of +1, while responses indicating a negative attitude were given a score of −1. Thus a score of zero would indicate an equal mix of positive and negative attitude items, while a higher score (up to +18), indicate a more positive attitude, and a lower score (down to −18), a more negative attitude.

Patients' knowledge about their disease was very poor (Fig. 3), with the highest score being a mere 16 (out of 22), and a median of 9. In fact, the upper quartile score was 11, indicating that 75% of the patients had a knowledge score of 50% (11 out of 22) or lower (Le Roux, 2016). Community health workers showed better knowledge than patients did, with scores ranging from 7 to 20, (median 14), and an inter-quartile range of 11 to 16. Nurses showed moderately high knowledge scores, with the lower quartile of 22 still being well above the 50% mark of 18 (out of 36). Only one of the 60 respondents in this group scored below 18 (median 23), which does, however, indicate that there is still room for improvement (Hassan, 2016).

The KAP results of the study involving healthcare providers were compared with those of the patients. Fig. 4 shows that patients' attitude scores ranged from very positive (16, close to the maximum of 18) to very negative (−16, close to the minimum of −18), although the general attitude seemed quite neutral (median 1) and an inter-quartile range of −4 to 5 (Le Roux, 2016). The attitude scores of the community health workers were more positive, with a median of 7 and an inter-quartile range from 1 to 10 (the lowest attitude score was −11). Interestingly, the highest attitude score of 14 in the healthcare providers was also not as high as that of the patients. The nurses displayed the most positive attitudes, with a minimum of only −4, and a maximum of 16. The median was 12.5, and the lower quartile score was still a moderately positive 9.5 (Hassan, 2016).

Fig. 5 shows that patients displayed neutral to moderately positive practices, with scores ranging from −8 to +8, but the inter-quartile ranging from 0 to 4 (median 2) (Le Roux, 2016). For the community health workers, the practice scores were moderate, with a minimum of 5 and a maximum of only 28 (out of 38). The median here was 16 (equating, incidentally, to a 50% practice score), and the inter-quartile ranged between 10 and 21. Nurses also showed good practice scores, with a low of 6 and a high of 15 (out of 16), and a median of 12 (Hassan, 2016).

7. Perceptions of patients regarding diabetes-related health communication strategies in the Free State, South Africa

A descriptive, exploratory, qualitative design was applied in the fourth primary study. The same public health facilities selected for the KAP study were included. Purposive sampling identified patients diagnosed with T2DM attending these health facilities. Semi-structured interviews focused on their perceptions regarding diabetes-related health communication strategies and data saturation was reached after 34 interviews. Data was analysed in ATLAS.ti using Creswell's steps of qualitative data analysis (Table 1)).

Two themes emerged namely guidance and self-management. Related to guidance, patients valued their interaction with healthcare workers and the categories that supported the theme reflected the dimensions in which such valued interactions operated. However, the patients emphasised the need for health information to be tailor-made to their specific needs including using their home language during patient-caregiver interactions. In addition, patients reflected the need for opportunities to ask healthcare workers questions related to their health. In as much as such questioning opportunities arose in certain instances, patients were afraid to ask healthcare workers questions due to certain perceived barriers. On the other hand, patients benefited immensely from information shared by other patients with diabetes in the waiting room. In such informal discussions, these patients were able to discuss sensitive issues affecting their health.

It became apparent that other patients influenced their understanding of health information and their potential of applying such health information during self-management. Other influencing factors included acceptance of their diagnosis and the role their family played in their self- management. Patients perceived an overall improvement in their self-management especially with regards to nutrition due to the support received from other patients and family members.

8. Designing a model for health dialogue

The four primary studies included in the development phase of the complex intervention culminated in the integration of data, with a view to proposing a health dialogue model for adult T2DM patients in the Free State. The findings from these studies (Table 2) thus helped to inform the design of a feasible, acceptable and potentially effective model for a health dialogue intervention that might have wider application for patients with other chronic diseases living in similar environments.

9. Development of a health dialogue model for diabetes

Following the consensus development conference methodology recommended by Murphy et al., (1998) a multi-disciplinary expert team (N = 16) met for a two-day workshop. The facilitator of the workshop was an expert in complex interventions as proposed by the British Medical Research Council (2000). Other members of the team included the researchers of each of the primary studies, a biostatistician, a health communications expert, experts from allied health professions with knowledge of and experience in health communications, a representative of the provincial health department, and nursing education experts involved in community-based outreach programmes and/or

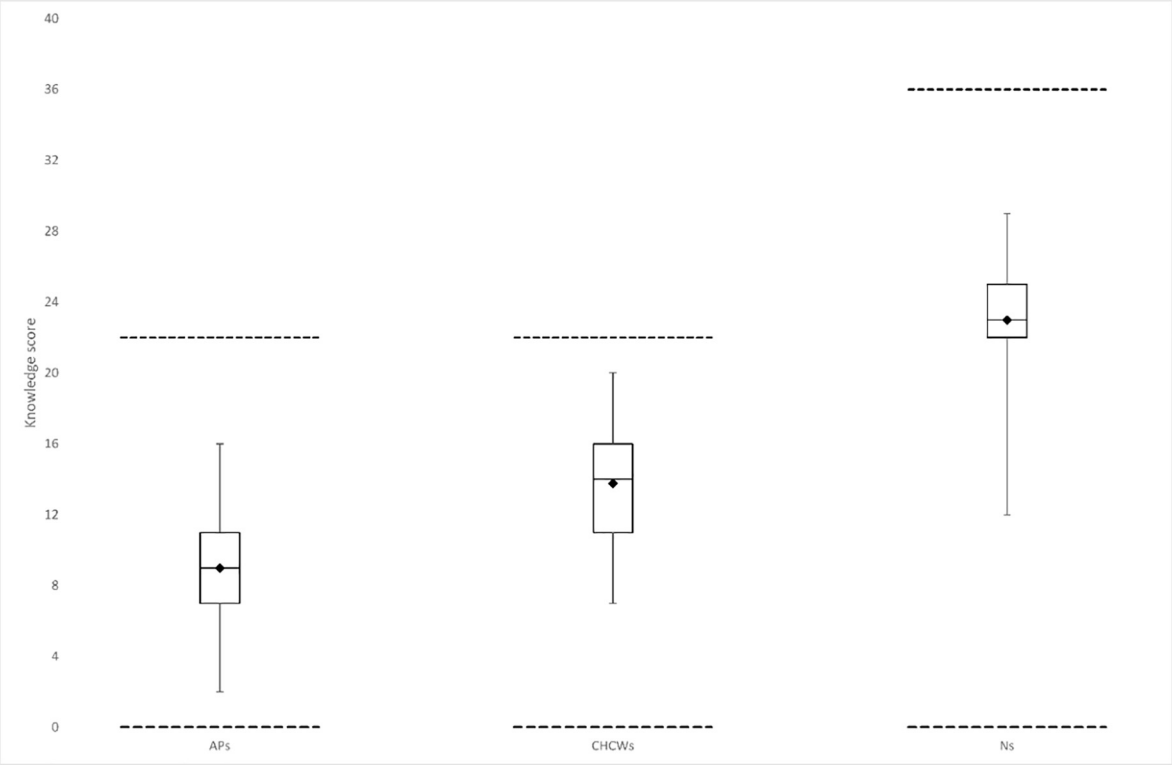

Fig. 3. Patients, Community Healthcare Workers and Nurses' Knowledge scores.

diabetes care.

The objectives of the workshop were to: present the evidence of the four primary studies conducted in the development phase of the complex intervention; identify the key issues of importance for the proposed health dialogue model, synthesize evidence and identify critical aspects to be incorporated in the proposed health dialogue model, and to plan the feasibility testing of a larger scale trial of the health dialogue model (still to follow).

Three focus areas were identified, namely the *community*, the *patient,* and the *healthcare provider* (Table 3). After in-depth and lengthy

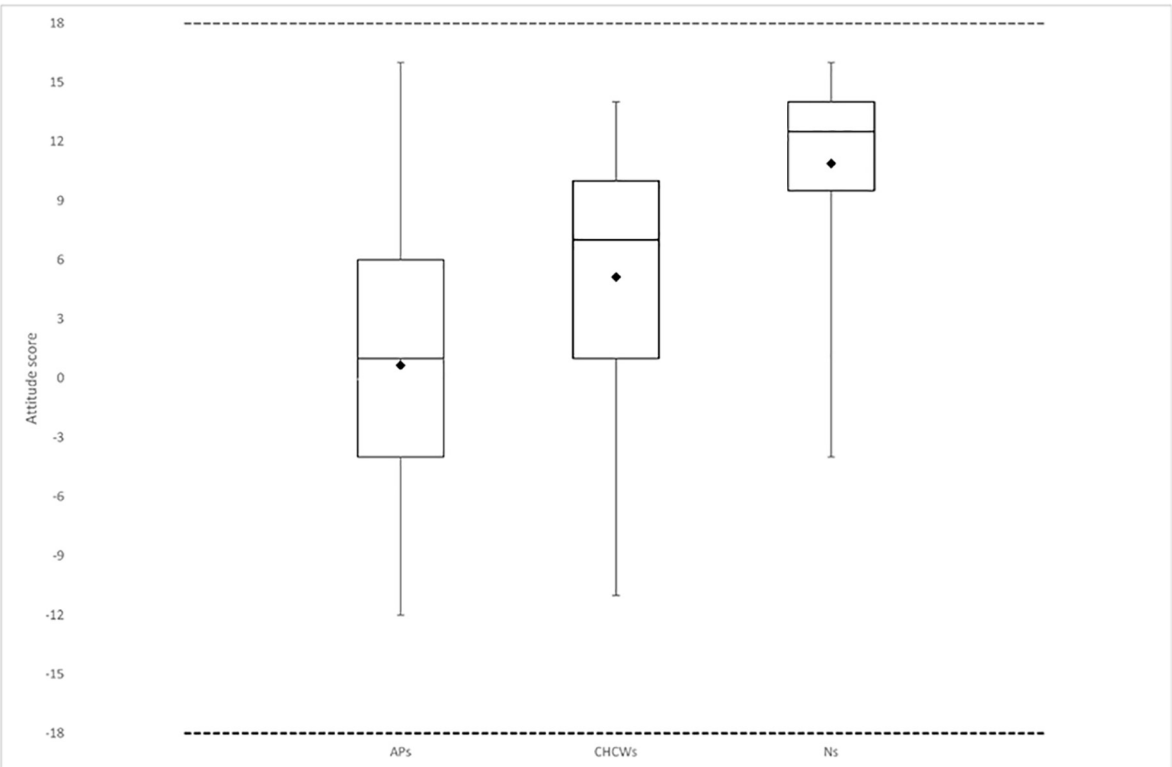

Fig. 4. Patients, Community Healthcare Workers and Nurses' Attitude scores.

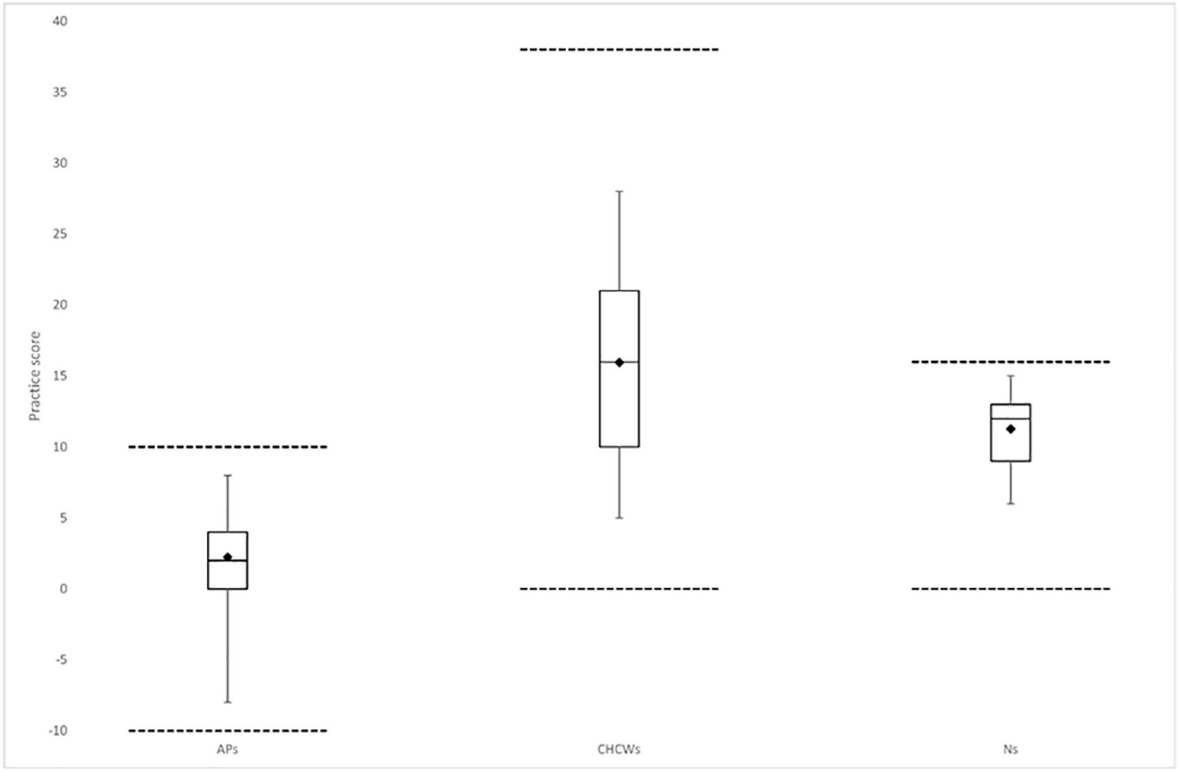

Fig. 5. Patients, Community Health Workers and Nurses Practice scores.

Table 1
Findings: Perceptions of patients regarding diabetes-related health communication strategies.

Theme	Category	Sub-category
Guidance	Motive	
	Content	
	Source	
	Technique	
	Evaluation	
Self-management	Influencing factors	Interpersonal factors
	Lifestyle modification	Intrapersonal factors
		Nutrition
		Outcome

discussions, consensus was reached to design the envisaged health dialogue model around these three focus areas.

The unacceptably high incidence of diabetes in LMICs and the stigmatisation of the disease convinced the workshop participants that community awareness regarding diabetes needed to be improved. It was suggested that the ideal setting for this interaction could include waiting rooms of healthcare centres. After deliberations with the communications experts and taking cognisance of the composition of the target population, consensus was reached that the best way to do this would be by means of presenting key messages (Table 4) for patients with diabetes (identified using the findings from the KAP surveys) through combinations of traditional folk media such as drama, song, poetry and storytelling (identified using the findings of the integrative review and qualitative perceptions of patients with diabetes primary studies). All agreed that the messages need to be communicated regularly and that the medium should be the patients' home language.

Table 2
Key findings of studies.

Key findings: health dialogue concept analysis	Key findings: integrative review	Key findings: KAP	Key findings: perception of patients
Antecedents: Positive attitude, Sensitivity, Respect, Training *Characteristics:* Equal symbiotic health relationship, Reciprocal health communication, Health message *Consequences:* Improved health outcome	Health dialogue may be *delivered in different ways*, e.g. face to face, technologically, individually, groups A combination of approaches is recommended Frequent dialogue (e.g. weekly) is recommended Venues should be convenient for patients, and private Dialogue interventions to be presented by trained healthcare providers/patients, or technological means Specific individualised/focused health information regarded more effective than general health information	Majority of participants are Sesotho[1] speaking *Knowledge:* Patients' knowledge was poor, and healthcare providers' knowledge in need of improvement *Attitude:* High levels of stigma and shame are associated with diabetes *Practice:* Patients perceived advice about diet, lifestyle, etc. as punitive and negatively affecting their quality of life Patients were aware that they should exercise, but did not heed this advice; Healthcare providers knew about good practice guidelines, but did not follow them	Patients valued interaction between themselves and the healthcare providers Contact and information shared with peers in the waiting rooms were helpful Patients preferred information that was tailored to their specific needs and delivered in their own language Patients needed an opportunity to ask questions, but were not always afforded such opportunities Patients were reluctant to challenge the authority of healthcare providers

[1] Sesotho, one of the South African official languages.

Table 3
Diabetes Health Dialogue Model developed in a LMIC.

Focus	Component/Aim	Intervention content
Community	*Raising community awareness*	
	Setting	In waiting room of health centres
	Format	Presenting key diabetes messages through combination of traditional fold media (weekly × 12 weeks): Drama and song, poetry and/or storytelling (native language speakers from the community)
	Promoting self-management	
	Setting	Healthcare centres and accessible community facilities Face to face meetings/technology
	Format	Presenting key diabetes messages through combination of traditional fold media (weekly × 12 weeks): Drama and song, poetry and/or storytelling (native language speakers from the community)
		Principles • Individual/group activities • Tailored health communication • Provide patient choices • Methods: (weekly × 12 weeks) • Mobile health devices (professional healthcare provided + mobile service provider) • Peer support (trained peers/community healthcare workers)
Healthcare provider	*Creating training platforms*	
	Setting	During scheduled in-service training

Table 4
Key messages identified for patients with diabetes.

1. Diabetes can be controlled and complications prevented
2. Eat small regular meals
3. Walk fast for at least 30 min most days
4. Take medication as prescribed
5. Lose weight as prescribed
6. Patients with diabetes can enjoy normal lives

The findings of the primary studies also indicated that self-management of patients diagnosed with diabetes needed to be promoted in healthcare centres and other accessible community facilities. The expert participants drew on the findings of the integrative review that presented a clear case for using face-to-face communication such as that applied during peer support, or using technological support such as mobile health devices to achieve this. Such individual or group activities need to focus on tailored health communication during which patients could actively participate. The absence of emphasis in the primary studies on clinical management, including history taking, routine examination and special investigations as prescribed SEMDSA Type 2 Diabetes Guideline Expert Committee. (2017), does not necessarily undermine the importance of clinical care.

The third focus area identified had a bearing on the healthcare providers. It was agreed that healthcare providers would benefit from participating in a focused diabetes training platform. Therefore, workshop participants concluded that scheduled in-service training sessions for healthcare providers would create a platform for interactive workshops where the identified key diabetes messages could be applied. The model that was designed is depicted in Table 3.

10. Integrity of the developed health dialogue model

The development of the intervention was guided by the Medical Research Council's Complex Intervention Framework (2000), and each study complied with rigour, validity and reliability. The concept analysis directed by Walker and Avant's (2011) framework for performing a concept analysis, assisted the researchers to be meticulous throughout all the stages of the analysis. Whereas the integrative review was structured according to the Preferred Reporting Items for Systematic Reviews (PRISMA) Statement (Liberati et al., 2009). The KAP studies adhered to the STROBE Statement checklist (Von Elm et al., 2007) and the semi structured interviews to the consolidated criteria for reporting qualitative research (COREQ) (Tong, Sainsbury, & Craig, 2007). The structured nature of the two-day workshop and active involvement of the interdisciplinary research team members further enriched the development of the model.

11. Ethical considerations

Ethical approval was obtained from the Health Sciences Research Ethics Committee of the University of the Free State (ECUFS 39/2013), and the Free State Department of Health. The study was directed by three primary ethical principles on which standards of ethical conduct in research should be founded, as was expressed in the Belmont Report. The studies complied with the principles of beneficence, respect for human dignity and justice (Belmont report., 1979). Literature in both the concept analysis and integrative review is traceable, available and sound. Participants of KAP surveys and those sharing their perceptions regarding diabetes-related health communication strategies, as well as workshop participants gave informed consent prior to answering questions during structured - and semi structured interviews respectively or engaging in the workshop.

12. Discussion

In broad terms, health dialogue incorporates strategies that increase the likelihood to change behaviour that can improve health. Health dialogue between a healthcare provider and patient, recognises the equal standing of the patient during health communication (Reid, 2015).

Effective health communication encourages healthy behaviour (Rensburg & Krige, 2011; Suggs, 2006), because it provides relevant information that results in an awareness and understanding of the health issue, taking the individual situation of the patient into consideration (Basu & Dutta 2009; Ebina, Kawasaki, Taniquchi, Yamazaki, & Sparks, 2010; Rensburg & Krige, 2011).

According to Mayosi et al. (2012), the counselling currently given in public health facilities in South Africa often follows an instruction-like format that poorly responds to the individual needs of patients. Furthermore, patient priorities and preferences are often in conflict with recommendations on lifestyle changes (Wermelink, Thiele-Manjali, Koschack, Lucius-Hoene, & Himmel, 2014). According to Ajzen's theory of planned behaviour, behavioural beliefs, norms and attitudes influence the intention to change behavior (Ajzen et al., 2011) and thus these influential factors need to be taken into consideration in the health dialogue process.

The developed model aimed at raising community awareness of type-2 diabetes, promoting self-management, and creating a focused training platform for healthcare providers caring for patients diagnosed with diabetes.

12.1. Raising community awareness

Patients with diabetes form part of a community that plays a critical role in their support. In addition, diabetes is a lifestyle disease that needs to be addressed through raising awareness on a community level (Pakenham-Walsh & Bukachi, 2009). Increased awareness requires effective communication that has the potential to lead to positive attitudes and behaviours that play a significant role in disease prevention and management.

In order to raise community awareness, however, the cultural context needs to be considered. South Africa is characterised by diversity necessitating sensitivity towards culture. The cultural context influences the patient's activity choices, and healthcare providers must be aware of this (Meier & Hartell, 2009).

Incorporating community traditions, such as songs and story-telling into health dialogue, offers culturally appropriate ways of conveying a message. In this way health messages are transmitted in a comprehensible, credible, affordable, and accessible manner. Such informal, active-learning methods are highly compatible with primary healthcare principles and have promotive, empowering, participatory and sustainable qualities (Manchaiah & Zhao, 2012; Silver, 2001). The universal nature of storytelling across multiple cultural contexts are widely accepted (Carter-Black, 2007). In the African context, employing the time-honoured oral traditions of songs and story-telling as a vehicle for communicating health messages contributes to engaging people at local level.

Greenhalgh, Collard, and Begum (2005) report a complex intervention for diabetes education among a diverse group of minority ethnic groups that did not speak English, conducted in a deprived inner London district. They applied participatory informal storytelling as a complex intervention to engage the community. This approach succeeded in improving the understanding of diabetes amongst participants and was perceived as very positive.

Another awareness intervention making use of storytelling was conducted in a predominantly Xhosa-speaking township located 40 km outside of Cape Town in South Africa. In this poverty-stricken community, rates of unemployment were estimated to be higher than 50%. The community was served by a single primary healthcare clinic. Researchers, clinic staff and the local community advisory board developed an intervention based on the Xhosa tradition of *intsomi*, in which storytelling is used as an educational tool. Historically, stories in the tradition of *intsomi* have been used to help instruct young people on the traditions and customs of Xhosa- speaking peoples, as well as to teach moral values and impart knowledge. The stories are driven by a narrator (the storyteller) who introduces the characters. In this South African study, storytelling lead to a substantial increase in the demand for pre-identified services, strengthening healthcare (Middelkoop, Myer, Smit, Wood, & Bekker, 2006).

12.2. Promoting patient self-management

Patients with diabetes are ultimately responsible for their own health and blood glucose control. Despite this, many patients with diabetes either (a) do not really believe they have diabetes, or (b) do not really believe that diabetes is a serious disease, or (c) lack motivation for behavioural change, or (d) do not believe that recommended treatments will make a difference to their own outcomes (Redmon et al., 2014). In order to improve the health of these patients, these issues need to be addressed and self-management support needs to be provided. Self-management focuses on the ability of patients to monitor their own condition whilst achieving a satisfactorily quality of life through cognitive, behavioural and emotional responses displayed by them (Omisakin & Ncama, 2011).

Self-management training is an important strategy for improving quality of care (Pienaar, 2016). Interventions based on improving the patient's ability to care for themselves have demonstrated benefits in terms of both quality of life and glycaemic control. However, few patients are willing to participate in such interventions, fall-out is relatively high and the number of professionals that are willing to offer the required support is limited (Chen, Liu, & Hwang, 2011). In view of the evidence in favour of self-management, every effort should be made to address the mentioned barriers and to motivate and support patients.

Effective health communication can also foster support between individuals with the same health-related problems (Tanvatanakul, Amado, & Saowakontha, 2007; Ebina et al., 2010). Peer support is defined by Dennis (2003, p. 329) as the "the provision of emotional, appraisal, and informational assistance by a created social network member who possesses experiential knowledge of a specific behaviour or stressor and similar characteristics as the target population, to address a health related issue of a potentially or actually stressed focal person". This definition reflects the social support model, which is defined as the process through which social relationships might promote health and wellbeing (Smith, Whitford, O'Kelly & O'Dowd, 2007). Through peer-support, myths, misconceptions and misunderstandings can be addressed while knowledge is improved and positive behaviour is reinforced (Prilutski, 2010). In addition to the challenge of carrying out daily tasks, many people with diabetes live with worries and fears about their future health and well-being or with some of the complications of diabetes. Having to face these burdens without sustained support may make it difficult to follow a healthy lifestyle (Funnell, 2011).

According to the University of North Carolina at Chapel Hill. (2017), peer support is characterised by four main pillars, namely 1) assistance in daily management (using own experiences with diet, physical activity and medicine adherence to help people to manage diabetes in their daily lives); 2) social and emotional support (helping others to cope with social or emotional barriers and to stay motivated to reach their goals); 3) linkages to clinical care and community resources (encouraging individuals to seek out clinical and community resources); and 4) ongoing support, extended over time (keeping patients engaged by providing proactive, flexible, and continual long-term follow-up).

Self-management education (based on key messages) for patients with diabetes can also be delivered through mobile communication, designed to sustain engagement of patients with their diabetes care. Mobile technology presents a unique opportunity for personalised, targeted, secure and, most importantly, clinically sound communication and engagement with patients.

According to Sankula (2016), mobile health dialogue can *inform* (provide the patient with personalised and timely health information), *transform* (guide the patient through behavioural change) and *perform* (attain tangible improvements in health outcomes) for each individual, one person at a time.

12.3. Creating a training platform for nurses

Klein et al. (2004) found that interventions for diabetes delivered by nurses were more successful than those delivered by non-nursing personnel. In this regard, Tshiananga et al. (2012) conducted a meta-analysis to determine the effect of nurse-led diabetes self-management education (DSME) on blood glucose control and cardiovascular risk factors. They found that nurse-led DSME was usually associated with improved glycaemic control.

In order for nurses to deliver an excellent service, however, they need to be equipped to do so. In developing countries, many healthcare workers have little or no access to basic, practical information and opportunities to update their knowledge or skills. Many have come to rely on observation, advice from colleagues and building experience empirically through their own treatment successes and failures. However, a lack of knowledge about the basics of diagnoses and management of common diseases often goes hand in hand with sub-optimal, ineffective and even dangerous healthcare practices (Pakenham-Walsh

& Bukachi, 2009).

Meeting the information needs of healthcare providers in the developing world may be hampered by various factors, including limited internet connectivity to acquire new information, a situation that has been termed "information poverty". The information and learning needs of family caregivers and primary and district health workers have been ignored for too long. Improving the availability and use of relevant, reliable healthcare information has enormous potential to radically improve healthcare worldwide (Pakenham-Walsh & Bukachi, 2009).

13. Conclusion

The development phase of the complex intervention described here synthesized relevant information to design a model for effective health dialogue between healthcare providers and patients with T2DM in order to encourage active involvement of patients in their own care, as this has been shown to improve health outcomes.

The primary studies indicated that such a model would need to focus on improving community awareness, promoting self-management and empowering healthcare providers through relevant training to implement effective health dialogue strategies.

In order to demonstrate the feasibility of the model, a follow up study is planned. It is envisaged that this approach can potentially inform health dialogue in other South African provinces and low-/middle income countries, to the benefit of both patients and healthcare providers.

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Conflict of interest

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Appendix A. Supplementary data

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