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RESEARCH ARTICLE

Knowledge, attitude, and practices related to diabetes among patients with type 2 diabetes mellitus at Tshepong Hospital

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Background: Despite advancements in pharmacological treatments for diabetes mellitus (DM), the significance of adequate knowledge, a positive attitude, and proper self-care practices among individuals with DM cannot be overstated.
Aim This study assessed the knowledge, attitude, and practices (KAP) related to diabetes among patients with type 2 diabetes mellitus (T2DM).
Materials and methods: This cross-sectional study surveyed 161 patients with T2DM at Tshepong Hospital over five months. An interviewer-administered questionnaire was used to evaluate their KAP. Glycaemic control was assessed using the most recent glycated haemoglobin (HbA1c). Data were analysed descriptively using means (standard deviation), frequencies, and correlation statistics.
Results: The mean age of the participants was 55.94 ± 14 years, with females comprising 59% of the sample. Scores for knowledge, attitude, and practice were 57 ± 17%, 94 ± 9%, and 40 ± 10%, respectively. No correlation was found between KAP and sociodemographic or clinical characteristics. A significant but weak positive correlation was identified between knowledge and practice ($r = 0.19391$, p-value 0.013). There was no association between composite KAP scores and glycaemic control. Poor glycaemic control (HbA1c ≥ 7%) was observed in 86.34% of participants.
Conclusion: The study indicates that a positive attitude alone is insufficient for effective self-care practices, due to poor knowledge. The absence of a significant relationship between KAP and participants' characteristics suggests the presence of other unexplored confounding factors. Further research is needed to identify these determinants of KAP.

Keywords: diabetes mellitus, type 2 diabetes mellitus, knowledge, attitude, and practice

Introduction

Diabetes mellitus (DM) is among the largest health epidemics worldwide, and one of the top 10 causes of death globally, affecting mostly working-age individuals.[1] The International Diabetes Federation (IDF) Diabetes Atlas estimated that 537 million adults between the ages of 20 and 79 were living with DM (1 in 10) in 2021.[1] This is predicted to increase to 643 million by 2030 and 783 million by 2045.[1] The Global Burden of Disease Study predicts a more than twofold increase in DM cases (> 1.3 million people) by 2050,[2,3] due to obesity and demographic changes, which are risk factors for developing type 2 diabetes mellitus T2DM).[3] In Africa, 24 million adults are living with DM, with a 129% increase predicted in 2045.[1] The latter is associated with an increasingly unhealthy diet, a sedentary lifestyle, an ageing population, and urbanisation. South Africa has the highest prevalence rate of DM (11.3%) in Africa, with 4.2 million (one in nine) adults living with DM and about 50% undiagnosed.[1]

Effective DM management involves pharmacological treatment and lifestyle modification, with success highly dependent on the patient's self-care practices.[4–6] These practices include diet control, regular exercise, smoking cessation, weight reduction, self-monitoring of blood glucose (SMBG), foot care, regular eye checks, and adherence to prescribed medications.[5] Adequate knowledge with a good attitude positively impacts self-care practices.[6,7] The American Diabetes Association (ADA) and Society of Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) recommend diabetes self-management education and support (DSMES) for all individuals with DM at the time of diagnosis, annually and when not achieving targets, changes in life and care, or complicating factors (psychosocial, physical, or medical) occur.[5,8] Healthcare professionals should also be trained in DSMES.[8] DSMES has been associated with improved knowledge and self-care practices regarding DM, lower HbA1c, a better quality of life, weight loss, reduced all-cause mortality, improved coping behaviours, and lower healthcare expenses.[5,8] Assessing patients' knowledge of their disease positively impacts health education intervention.[8] Thus assessing the knowledge, attitude, and practices (KAP) of patients with T2DM is essential. However, based on Ajzen's theory of planned behaviour (TPB), adequate knowledge does not necessarily translate into good self-management practices or ignorance into poor self-care practices.[9] Multiple psychosocial factors like attitude (positive or negative feelings towards the recommended practices), subjective norms (their perceptions of what is expected by significant people in their lives), and perceived behavioural control (beliefs concerning

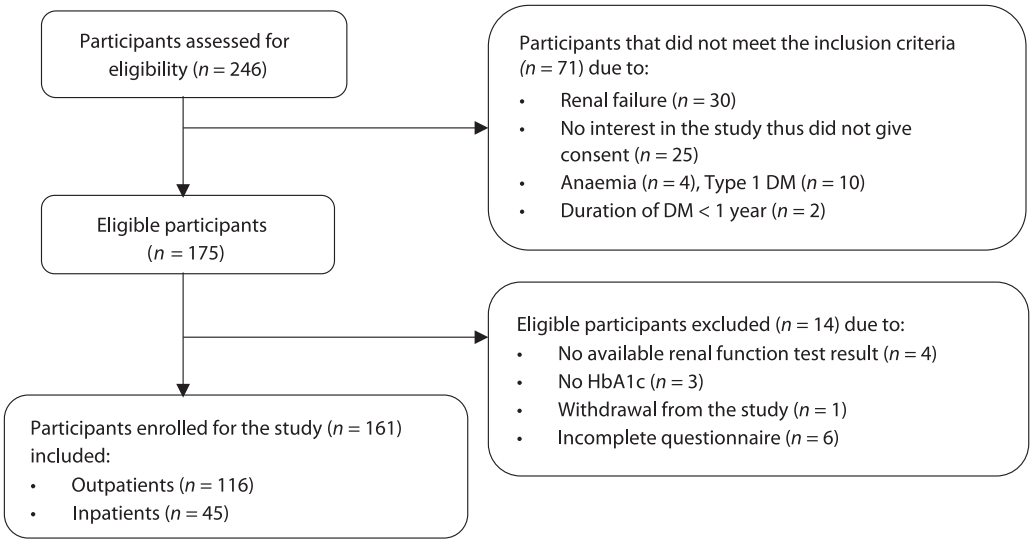

Figure 1: Flowchart showing inclusion/exclusion of patients for the study.

their ability to control the behaviour) of individuals with T2DM can predict their intentions (motivation) and their performance of self-management practices.[9–11]

Income significantly impacts mental and physical health, especially for people with chronic diseases like DM. This effect is due to the cost of appointments, transport fares, investigations, insulin storage, glucometers for SMBG, healthy food, essential items for managing hypoglycaemia, and exercise facilities.[12] Living costs in South Africa range from R13 940 (US$820) to R52 700 (US$3 100) per month, with rising healthcare costs due to chronic disease prevalence, population growth, and increased medication and medical technology costs.[13,14]

A few studies have been conducted in South Africa regarding the KAP related to DM among people with T2DM, including those conducted in Limpopo, KwaZulu-Natal, Western Cape, and Free State.[15–18] However, there is a paucity of data in the Northwest province, thus the need to assess the KAP of patients with T2DM at Tshepong Hospital.

Aims

The study aimed to assess the diabetes-related KAP among patients with T2DM at Klerksdorp/Tshepong Hospital in South Africa. The primary objective was to report the association of KAP as separate variables, with participants' sociodemographic and clinical characteristics, and the association between the composite KAP score and HbA1c. The secondary objectives included identifying the association between knowledge and attitude versus practice, obstacles to good KAP among people living with T2DM, and recommending strategies if needed.

Methods

Study design and setting

This was a cross-sectional study among in- and outpatients at Tshepong Hospital over five months, from September 2022 to January 2023. Tshepong Hospital is a public hospital that provides medical services to Klerksdorp residents and patients referred from other health centres in the Northwest Province. The setting for this study was the medical outpatient department (MOPD) and the medical wards.

Study population, sample size, and sampling strategy

The study included outpatients attending the MOPD and inpatients on admission to the medical wards aged ≥ 18 years with T2DM who had been diagnosed for at least a year and provided informed consent. Pregnant women and very ill or mentally disabled persons were excluded. Participants with conditions altering HbA1c (haemodialysis, renal failure, haemoglobinopathy, iron deficiency anaemia, and use of systemic steroids), were also excluded.

This study used a precision/prevalence method defined as $n = Z^2 P (1 - P) / d^2$, where n = sample size, Z = statistic for the level of confidence, P = prevalence or expected proportion, and d = precision, to estimate the sample size for the study. A sample size of 100 was estimated, assuming a conservative estimate of 30% for knowledge, based on the result of a similar study[7] from which the questionnaire was adapted, with a ± 9% precision and a 5% significance level. Patients were selected by systematic sampling, where every second patient with T2DM who met the inclusion criteria was enrolled. This is cheaper, less time-consuming, and without selection bias. Of the 246 patients assessed for study participation, 161 were enrolled (see Figure 1).

Data collection

The data collection was done by the principal researcher and a research assistant (fluent in Sesotho, isiZulu, Setswana, Afrikaans, and English), after being trained by the principal researcher. Patients were informed about the study; written informed consent was obtained from those eligible and willing to participate. Face-to-face interviews were conducted during which the researchers read and explained the questions to participants while remaining unaware of the correct answers. Responses were documented in the questionnaire by the researchers. The research assistant also assisted the principal researcher by interpreting when a participant did not understand English. Participants' most recent HbA1c was obtained from their files. Unique numbers were allocated to each questionnaire, and no identifying information was documented. Completed questionnaires were stored under lock and key. The data were captured on Research Electronic Data Capture (REDCap), a secure web-based platform (https://projectredcap.org/), using a password-protected laptop that was hosted at the University of the Witwatersrand.

Study tool

The study used a four-section structured questionnaire adapted from a Vietnam-based study by Le *et al*.[7] The questionnaire had previously been validated, the reliability was tested, and Cronbach's alpha was 0.738.[7] Cronbach's alpha is a widely used test for measuring the internal consistency (the degree to which all items in a test assess the same concept) of a survey or assessment tool. It ranges from zero to one. It is closer to zero when the items are not closely related but closer to one when the items are closely related, with an acceptable value of ≥ 0.7.[19,20] Section 1 captured the sociodemographic and clinical characteristics of the participants. Section 2 explored the participants' knowledge of DM including its definition, causes, types, risk factors, symptoms, complications, and prevention strategies. Section 3 was the attitude section, asking about participants' perspectives on DM and their feelings towards recommended self-care practices. Finally, section 4 was the practice section, which assessed the participants' self-care practices related to DM. These included medication adherence, blood sugar tests, foot care, lifestyle modifications, and hypoglycaemia management.

Scoring

The knowledge section consists of 10 multiple-choice questions, with 1 score allocated for the correct response. The attitude section included 10 x 5-point Likert scale questions. The sum of the points was converted to a scale of 100 according to the Jacobson and the Diabetes Control and Complications Trial (DCCT) formula, 1994, and Best and Kahn, 2006 Transformed scale,[7] as follows:

$$\frac{\text{Actual raw score} - \text{Lowest possible raw score}}{\text{Possible raw score range}} \times 100$$

The practice section consists of 10 questions with a score of 1 for each correct response. A question that had all subsections with correct responses was allocated 1 mark. A question having any subsection with a wrong response was assigned a score of 0. The total score for each section was categorised into three levels, namely low level (< 60% of the total score), moderate level (60–79% of the total score), and high level ($\geq$ 80% of the total score). The composite KAP score of each participant was calculated as the percentage of the maximum composite KAP score achieved by each participant. The composite scores were classified similarly to each separate variable. Participants with HbA1c of $\geq 7\%$ were regarded as having poor glycaemic control.[5,21]

Data analysis

Cross-tabulations were computed to test for differences in responses by categorical variables. The test of association between categorical variables was assessed by chi-square statistics, whereas Student's t-test was used to compare means. Normality was assessed by the Shapiro–Wilk test, and the Wilcoxon Mann–Whitney test was used to compare non-parametric continuous data. Scores for KAP were calculated as separate variables, and their resultant distribution was visualised using a boxplot diagram. The Pearson correlation coefficient was used to test linear relationships between the composite KAP scores and HbA1c test results. The ANOVA F-test and global *p*-value were used to test the association between KAP scores and sociodemographic and clinical variables, with three or more levels. Where there was significance, Tukey's test was computed to test for pairwise significance. All statistical analyses assumed a 5% level of significance and were performed using Statistics Analysis System (SAS) Enterprise Guide 7.1 (https://www.sas.com/en_gb/home.html).

Ethical considerations

Ethics approval for this study was obtained from the Human Research Ethics Committee (Medical), University of Witwatersrand (approval number: M220624).

Results

Sociodemographic and clinical data

The study included 161 participants, the majority being female (59%) and black Africans (82%), with a significant proportion speaking Setswana or Sesotho. The mean age of participants was around 56 years, with a significant number of participants in the 60–84 age group. A large proportion of the sample had high school education (60.87%) but the majority were unemployed (86%) and had low income. Most participants had poor glycaemic control (86%) and a family history of DM (72.6%). The mean duration of diabetes was nine years, with a high mean HbA1c (10%), indicating poor glycaemic control (see Table 1).

Knowledge of the participants

The participants' overall knowledge score was low (57%), with 48% of the sample having low scores and only 18.6% having high scores (see Figures 2 and 3). A majority (84%) of the participants were aware that diabetes is a chronic disease characterised by hyperglycaemia but only 47% had knowledge that T2DM was caused by insulin resistance. A majority (82%) were aware of two types of DM, 67% were aware of the risk factors for developing T2DM, and 79% had knowledge of the symptoms. Only 23% had knowledge of the acute complications of DM, while 62.7% were aware of the chronic ones. Most participants (90.68%) had knowledge of complication prevention methods and 55% were aware of hypoglycaemic symptoms (see Figure 4).

Attitude of the participants

The participants' overall attitude score was high, with a mean score of 94%, with 89% of the sample scoring high (see Figures 2 and 3). The majority (> 90%) agreed on the importance of DM-related self-care practices like a healthy diet, exercise, foot care, concern for hypoglycaemia, and blood sugar checks for themselves and their families. The majority (96.5%) acknowledged the severe nature of DM complications and 98% the importance of preventing them.

Practice of the participants

The overall practice score was low at 40% with 94% of the sample having low practice scores, but all reported good medication compliance. A majority did not smoke (91%) or consume alcohol (87%) and were aware of food restrictions (95%). Only 4% of participants had their HbA1c monitored appropriately. Some 69% reported regular SMBG, but only 56.5% monitored appropriately; 64% of participants reported regular exercise, but only 24% had sufficient exercise. Only 29% of participants had adequate knowledge of foot care related to DM, and 53% experienced hypoglycaemia of which only 22% had knowledge of how to manage it (see Figure 5).

Table 1: Sociodemographic and clinical characteristics of the participants

Variables	*n* (%)
Total no of participants	161
Age in years	
18–39	34 (21.12)
40–59	62 (38.51)
60+	65 (40.37)
Average age (SD) in years	55.94 (14.07)
Age range	24–84
Gender	
Male	66 (40.99)
Female	95 (59.01)
Race	
African	132 (81.99)
White	18 (11.18)
Coloured (mixed race)	10 (6.21)
Indian	1 (0.62)
Education level	
No school	18 (11.18)
Primary school	45 (27.95)
High school	89 (55.28)
Tertiary studies	9 (5.59)
Employment status	
Employed	22 (13.66)
Unemployed	139 (86.34)
Average monthly income	
≤ R6 000	148 (91.93)
R6 001–R9 000	5 (3.11)
R9 001–R12 000	2 (1.24)
R12 001–R15 000	4 (2.48)
≥ R15 001	2 (1.24)
Home language	
English	2 (1.24)
Afrikaans	29 (18.01)
Sesotho	54 (33.54)
Setswana	49 (30.43)
IsiXhosa	22 (13.66)
IsiZulu	4 (2.48)
Other	1 (0.62)
Marital status	
Single	66 (40.99)
Married	59 (36.65)
Divorced/separated	13 (8.07)
Widowed	23 (14.29)
Family history of diabetes	
Yes	117 (72.67)
No	44 (27.33)
Presence of symptoms at diabetes diagnosis	
Yes	79 (49.07)
No	82 (50.93)
Duration of diabetes	
≤ 10 years	103 (63.98)
> 10 years	58 (36.02)
Mean (SD) in years	9 (8)
Range in years	1–40
Most recent HbA1c	
< 7%	22 (13.66)
≥ 7%	139 (86.34)
Mean (SD) in %	10 (3)

Relationship between knowledge and attitude, versus practice

A significant but weak positive correlation between knowledge and practice ($r = 0.19391$, $p = 0.0137$) was observed. However, there was no association between attitude and practice.

Relationship between KAP and sociodemographic and clinical characteristics

The result suggested no significant correlation between knowledge, attitude, and practice as separate variables with the participants' sociodemographic or clinical characteristics.

Relationship between KAP and glycaemic control

Irrespective of the moderate composite KAP score of 63% for the study participants, 86.34% had poor glycaemic control. There was no association observed between composite KAP scores and their glycaemic control ($r = 0.02309$, $p = 0.7713$).

Discussion

Our study found poor knowledge and practices despite a good attitude among patients with T2DM attending Tshepong Hospital at Klerksdorp. There was a weak correlation between their knowledge and self-care practices. However, there was no correlation between their KAP and their characteristics, or between their composite KAP and glycaemic control. Studies have reported mixed results, and comparisons may be challenging due to different study tools, ages, settings, and ethnic groups.

Level of KAP and their relationship with sociodemographic and clinical characteristics

Few South African studies have assessed KAP in DM.[15–18,22] A cross-sectional study in the Free State by Le Roux *et al*. found similar findings of inadequate knowledge where the participants had similar profiles to our study participants (a higher proportion of females and a similar mean age of participants), with even lower education.[18] The poor knowledge of participants in the Le Roux *et al*. study and ours was likely due to a lack of diabetes education, trained staff (endocrinologists, diabetes nurses, and dietitians), and a high physician–patient burden. Most participants received education only at diagnosis or while admitted for uncontrolled DM or emergencies. Low income likely led to limited access to educational materials in the media or pamphlets, thus further contributing to their poor knowledge regarding DM. However, unlike our study, the participants in the Le Roux *et al*. study had a negative attitude towards DM, with participants reporting a negative psychosocial impact due to the stigma of DM. This disparity could be due to the lack of exploration of the psychosocial impact of DM in our study. Thus, the findings of Le Roux *et al*. could have been a better reflection of the participants' attitudes than our study. Le Roux *et al*. and our study found poor self-care practices among participants due to a lack of physical activity and an unhealthy diet. Although participants had good knowledge and attitudes towards exercise, their poor exercise practice supports Ajzen's TPB,[9] which argued that adequate

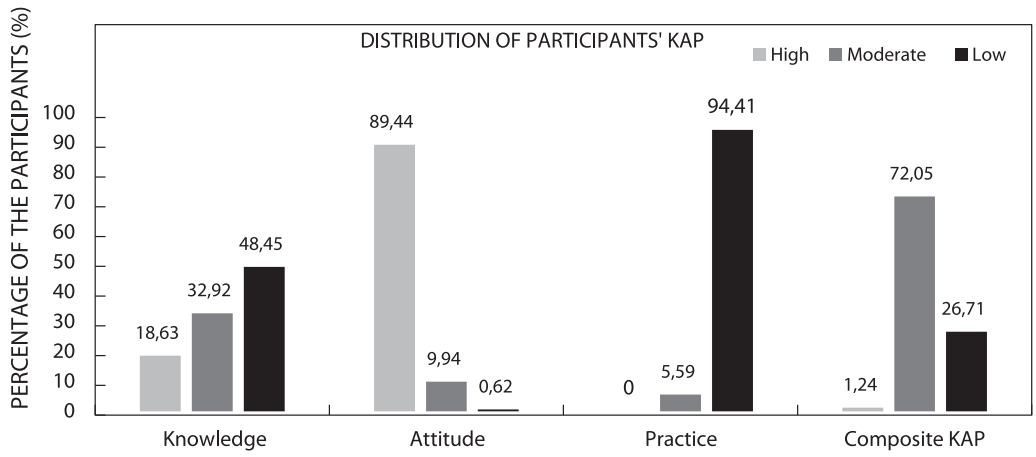

Figure 2: Level of DM-related KAP among patients with T2DM.

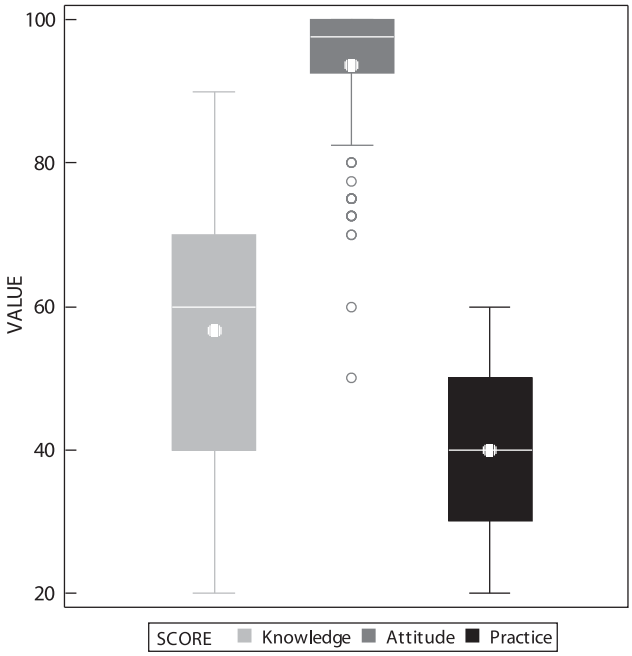

Figure 3: Boxplot showing knowledge, attitude, and practice score distributions computed by Jacobson's formula. The plot further shows median and mean scores.

knowledge is not a guarantee for good behaviour and ignorance does not necessarily lead to poor habits. Low income likely contributed to the inability to afford healthy food and engage in appropriate self-care practices related to DM. Le Roux *et al*. found a positive correlation between educational level, knowledge, and attitude, but not self-care practices. They also found a positive correlation between the duration of DM and self-care practices, possibly due to increased counselling and hospital visits.

Another cross-sectional study in South Africa by Peter *et al*. demonstrated contradictory findings of good knowledge but poor attitude and practices regarding lifestyle modification among patients with T2DM.[22] The better knowledge could be due to a higher percentage of educated participants, with 82% attaining primary and higher education and no illiteracy. However, good knowledge did not translate to a good attitude or practice.

A cross-sectional study by Alaofe *et al*. in Cotonou, Southern Benin, West Africa found a lack of knowledge, poor attitude, and self-care practice.[23] The poor attitude scores of the Beninese participants may be due to their lower education level. However, the attitude scores of our study participants could also have been poor if the same questionnaire used for the Beninese was used in our study. The larger sample size and the use of a more reliable tool (modified Diabetes Attitude scale where the psychological impact of DM on the participants was explored) for assessing the attitude of the Beninese may have provided a better reflection of their attitude, reducing response bias.

In a similar study in Saudi Arabia by Almousa *et al*., participants had good KAP regarding DM, with age, level of education, monthly income, marital status, and accommodation type having a significant association with the level of knowledge.[24] The better knowledge among Saudi Arabians could have been due to the significantly higher level of education, a higher proportion of married participants (60.5%), a lower proportion of unemployed participants (45.8%), and a higher proportion with access to trained staff like endocrinologists and diabetes clinics (42.3%). The better practice is likely due to a higher proportion of married participants (due to motivation from their spouses) and higher income to afford a healthy diet and expenses related to DM management.

A cross-sectional study in Vietnam by Le *et al*. reported similar results using the same KAP questionnaire.[7] The Vietnamese participants had a low knowledge score, a moderate attitude score, and a low practice score. Similar to our study findings, the poor knowledge of the Vietnamese was due to a lack of basic diabetes education. As in our study, the higher attitude scores of the Vietnamese could have been attributed to response bias resulting from the leading questions in the attitude section of the questionnaire. The low practice scores were likely due to poor knowledge. Interestingly, knowledge and attitude scores of the Vietnamese were lower despite their higher education and income, possibly due to their shorter DM duration. However, the practice score of the Vietnamese participants was higher, possibly due to their higher education and ability to afford healthy food. The three times higher proportion of married participants in the Vietnamese study could also have contributed to their better self-management practices due to support and motivation from their spouses. This highlights

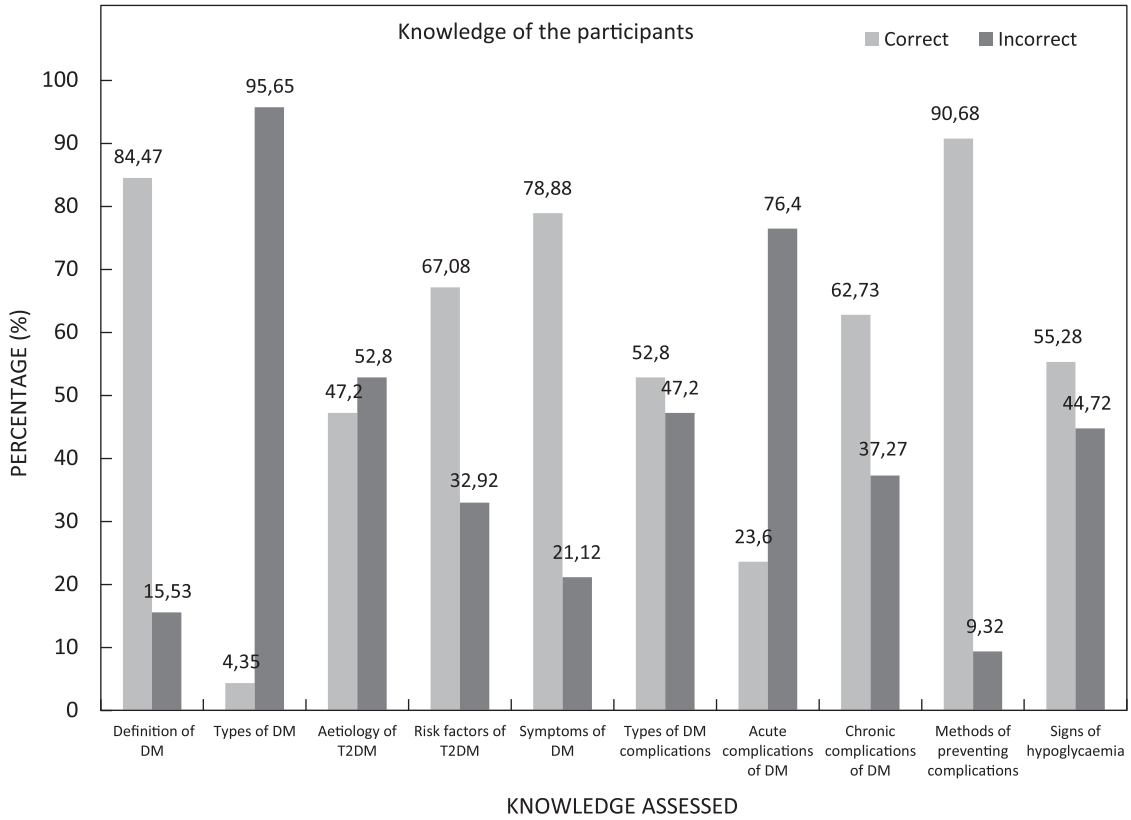

Figure 4: Knowledge of participants regarding diabetes. DM: diabetes mellitus, T2DM: type 2 diabetes mellitus.

the significance of motivation in influencing behaviours, as per Ajzen's TPB.[9–11]

The ADA and SEMDSA recommend individualised glycaemic control for most non-pregnant patients, with no significant hypoglycaemia, targeting an HbA1c of ≤ 7%.[5,21,25] Although the glycaemic control of the Vietnamese and our study's participants was generally poor based on these guidelines, the Vietnamese participants had better control than our study's participants (mean HbA1c 7.4% versus 10% in our study). This is likely due to their better self-care practices.

The self-care practices of our study participants were generally poor. The ADA and SEMDSA recommend that patients' HbA1c be tested every 3 months if HbA1c is > 7% or every 6 months if < 7%.[5,21] Only 7% had their HbA1c monitored appropriately as per the guidelines. SEMDSA also recommends SMBG at least daily for those on insulin and 3–5 times a week for those on oral agents,[5] but only 56.5% of the participants met

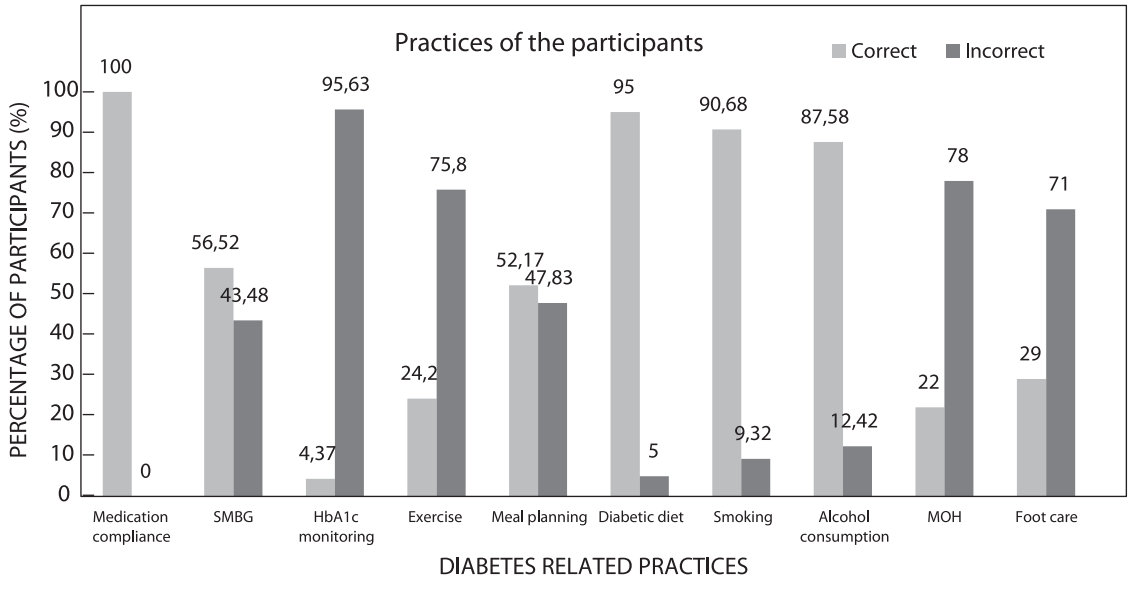

Figure 5: Participants' practices related to diabetes. MOH: management of hypoglycaemia, HbA1c: glycated haemoglobin, SMBG: self-monitoring of blood glucose.

the recommended guideline. The ADA and SEMDSA recommend at least 150 minutes of exercise per week for individuals with T2DM.[5,8] Only 24.2% had sufficient exercise based on the guideline, likely due to a lack of motivation and awareness of minimum exercise requirements.

The Vietnam study showed a significant relationship between participants' KAPs and ethnicity, marital status, DM duration, and employment status. Our study found no statistically significant relationship between KAP as separate variables and participants' sociodemographic or clinical characteristics. This suggests that there could be other compounding factors that have an impact on their KAP which were not explored. These factors could be lack of family support, motivation, poor self-control, lack of diabetes education in healthcare facilities, unfavourable home situations, poor health, lack of exercise facility, psychosocial/beliefs issues, and individual challenges. It is also possible that a significant relationship between KAP and participants' characteristics might have been found if our study had been conducted at multiple sites and a larger sample size used.

Relationship between knowledge and attitude with practice

Studies have shown mixed results regarding the relationship between knowledge and attitude with practice. Unlike our study, the study by Le Roux *et al*. did not demonstrate any significant correlation between knowledge and practice but, similar to our study, there was no relationship between attitude and practice.[18] The Vietnamese study demonstrated a significant association between attitude and practice but none between knowledge and practice.[7] However, the study in Saudi Arabia by Almousa *et al*. reported a strong correlation between knowledge and practice.[24] A similar study in India by Banu and Shireen found a significant but weak association between knowledge and practice and a significant moderate association between attitude and practice.[26] Our study found a significant but weak positive association between knowledge and practice but none between attitude and practice. These findings suggest that the poor self-care practices of the participants resulted partly from poor knowledge, and a good attitude is not enough to achieve the recommended self-care practices. Based on Ajzen's TPB, it could be suggested that psychosocial/belief factors such as motivation, subjective norms, and perceived behaviour control, not explored in our study, may have contributed to the poor practices of the participants.[9–11] Adequate knowledge with a good attitude is thus required to achieve good self-care practices, leading to participants achieving their recommended glycaemic targets.

Relationship between composite KAP scores and glycaemic control

Our study demonstrated no association between composite KAP and glycaemic control, similar to the findings in other studies.[27–29] However, the study conducted in Vietnam by Le *et al*. and in India by Solanki *et al*. reported a significant negative correlation between KAP and HbA1c.[7,30]

The glycaemic control of participants in our study was generally poor, with 86.34% of participants having an HbA1c of $\geq$ 7%. It is generally assumed that a good total KAP score will be associated with good glycaemic control. The moderate composite KAP score in this study did not result in good glycaemic control. This suggests that good knowledge, attitude, and practice as separate factors are all essential in achieving good control of DM. A deficiency in any of these cannot be balanced by the others to achieve treatment targets.

Limitations

As this was a cross-sectional study, only the relationship between variables could be examined and causal relationships could not be determined. The data regarding KAP were self-reported, potentially causing recall and social desirability bias. This study was a single-site survey with a small sample size, which limited its representation of T2DM and population diversity in South Africa. Complications like blindness, stroke, and limb amputation, which could be barriers to appropriate self-care practices, were not considered when assessing the participants. The questionnaire also had some limitations. It was only in English, potentially leading to reporting errors due to the language barrier. The knowledge questions were very specific and very technically worded and lay participants may not have understood some of them despite explanation by the researchers, thus possibly resulting in response bias. The leading nature of the questions in the attitude section may have also introduced response bias, potentially contributing to the higher attitude scores.

Conclusion

Although the management of T2DM has evolved with improved pharmacological treatment, good patient KAP is key to achieving treatment targets. Patients at Tshepong Hospital have demonstrated poor knowledge and self-care practices, despite a positive attitude towards DM. This indicates that good knowledge, augmented by a good attitude, is needed to achieve good self-care practices. A weak positive correlation between knowledge and practice suggests the need for improved diabetes education. Our study recommends improving the KAP of individuals living with T2DM through DM education as recommended by the ADA and SEMDSA, as well as professional support from dietitians, psychologists, and behavioural therapists. The study suggests promoting SMBG by providing individuals with DM with glucometers. The study also recommends future multisite studies with a larger sample size to explore other determinants of KAP such as beliefs and psychosocial factors.

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Appendix

QUESTIONNAIRE

QUESTIONNAIRE FOR ADULT PATIENTS WITH TYPE 2 DIABETES MELLITUS AT TSHEPONG HOSPITAL

FOR PATIENTS 18 YEARS AND OLDER

Only for patients with type 2 diabetes mellitus, 18 years and older and who have given written informed consent

DIABETIC KNOWLEDGE, ATTITUDE, PRACTICE

Patient study number (Office use): _____

Date: _____

A. SOCIODEMOGRAPHIC AND CLINICAL INFORMATION

1 Gender: Male ☐ Female☐

2 How old are you in years:

3 Race:

1	African
2	White
3	Coloured
4	Indian
5	Others

4 What is your home language?

1	English
2	Afrikaans
3	Sesotho
4	Setswana
5	IsiXhosa
6	IsiZulu
7	Others

5 Marital status

1	Single
2	Married
3	Divorced/Separated
4	Widowed

6 What is the highest level of education?

1	No school
2	Adult basic education and training
3	Some primary school
4	Completed primary school
5	Some high school
6	Completed high school
7	Diploma/ Degree
8	Others(Specify)

7 Occupation

1	Employed
2	Unemployed

8 Average monthly income

1	≤ R6000
2	R6001- R9000
3	R9001 – R12000
4	R12001 – R15000
5	≥ R15001

9 History of diabetes

1) How long ago were you diagnosed with diabetes: | | |

2) Family history of diabetes: Yes ☐ No☐

3) Were you sick at the time you were diagnosed with diabetes?
Yes ☐ No ☐

4) Most recent HbA1c : | | % |

B. DIABETIC KNOWLEDGE

Please circle the letter that you think is the best.

1. What is diabetes?
   a. Diabetes is a chronic metabolic disorder characterized by hyperglycaemia
   b. Diabetes is a chronic metabolic disorder with a manifestation of hypoglycaemia
   c. Diabetes is a disease spread in the community

2. *How* many types of diabetes are there?
   a. 1 type
   b. 2 types
   c. 3 types

3. What causes type 2 diabetes?
   a. Because the body produces lack or does not produce insulin
   b. Because the body is resistant to insulin (usually occurs in obese people and > 40 years old)
   c. Occurs in pregnant women (no previous diabetes)

4. Who is at risk for diabetes?
   a. People who are obese, sedentary, eat a lot of fat, sweet, starch, alcohol, tobacco, family history of diabetes
   b. Muscular people, exercise regularly, eat well, do not smoke, do not drink alcohol
   c. Thin people, eat normally, have no family history of diabetes

5. What are diabetic symptoms?
   a. Eat a lot, drink a lot, lose weight a lot, urinate a lot
   b. Eating normally, losing little weight, moderate urination
   c. Eat less, lose weight, urinate often

6. How many types of diabetic complications are there?
   a. One type: acute complications
   b. Two types: acute complications and chronic complications
   c. Three types: acute complication, subacute complication, and chronic complication

7. What are the acute complications of diabetes mellitus?
   a. Hyperglycaemia and foot ulcer
   b. Insomnia, anxiety, and weight loss
   c. Hypoglycaemia and coma due to hyperglycaemia, ketoacidosis, and lactic infections

8. What are the chronic complications of diabetes mellitus?
   a. Hypoglycaemia and coma
   b. Cardiovascular complications, decreased vision, kidney failure, impotence, foot ulcers
   c. Insomnia, anxiety, difficulty breathing

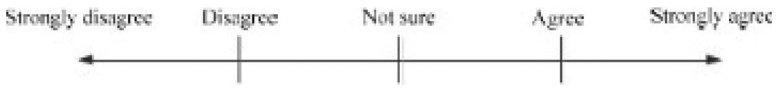
9. What are the methods of complication prevention in diabetic patients?
   a. Routine blood glucose testing, prescription medication, reasonable eating, proper exercise
   b. There is no need for routine blood glucose testing, no need for food, no medication, and limited movement
   c. Test whenever you want, just taking the medicine is enough without/don't need the well eating and exercise

10. What are the signs of hypoglycaemia in diabetic patients?
    a. High fever, cold shaking
    b. Uncomfortable, sweating, dizziness
    c. Abdominal pain, difficulty breathing

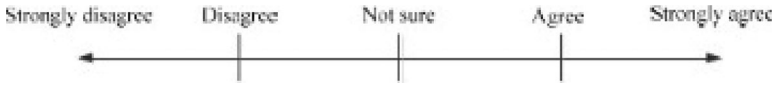
C. DIABETIC ATTITUDE

Please circle the answer you choose

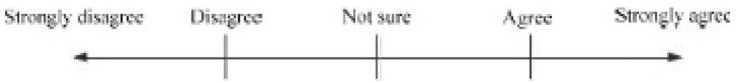
1. Do you agree that blood glucose testing for you and your family is necessary?



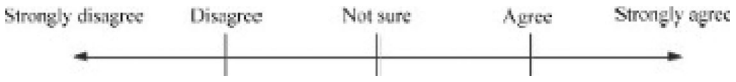
2. Do you agree that diabetes can be well controlled?



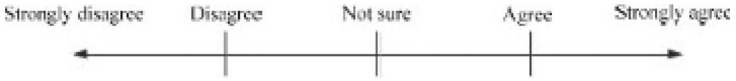
3. Do you agree that blood sugar can be controlled by exercise, sports and medicine?



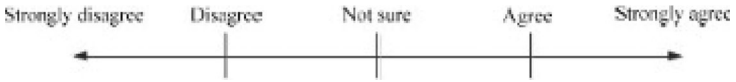
4. Do you agree with a reasonable diet that can control blood sugar?



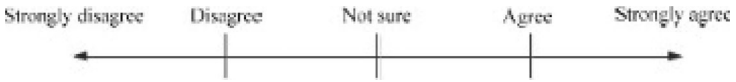
5. Do you agree with the need to have regular medical check-ups and blood sugar checks?



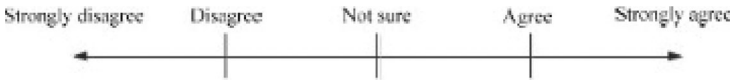
6. Do you agree that complications of diabetes are a very serious problem?



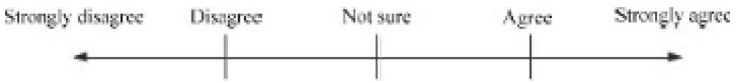
7. Do you agree that prevention of complications is important in treating diabetes?



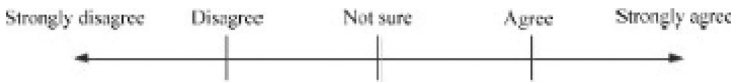
8. Do you agree that daily exercise can control diabetes complications?



9. Do you agree about worrying about hypoglycaemic complications?



10. Do you agree with taking care of your feet while treating diabetes?



D. DIABETIC PRACTICE

Please answer all the questions below

1. Which method do you treat diabetes with?
   ☐ Oral medicine. How many tablets per day? _____ tablets. How many times per day? _____ times
   ☐ Insulin injection. How many times of injection? _____ times.
   Injection site? _____
2. Do you have regular blood sugar tests? ___ yes ___ no
   Where do you check? _____ How often? _____
3. Do you have an HbA1C test? _____ yes _____ no
   Where do you check? _____ How often? _____
4. Do you exercise regularly? _____ yes _____ no
   How long in a day? _____ How many days per week? _____
   Which method do you exercise? _____
   Do you know exercise can lower blood sugar? ___ yes ___ no
5. How many meals do you eat a day? _____
   Should you skip meals? _____ yes _____ no
6. What kind of foods do you need to limit or reduce?
   _____
   _____
7. Do you smoke cigarettes? _____ yes _____ no
   How many cigarettes per day? _____ cigarettes
   How long have you smoked? _____
8. Do you drink alcohol? _____ yes _____ no
   If yes, what is the level of drinking? _____
9. Have you ever had hypoglycaemia? _____ yes _____ not yet
   If so, how did you handle it? _____
10. How do you take care of your feet?
    _____
    _____

THANK YOU FOR YOUR ANSWERS!