

# Knowledge, attitude, and practices related to diabetes among community members in four provinces in Kenya: a cross-sectional study

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## Abstract

This cross-sectional study sought to establish the level of knowledge of diabetes among community members in rural and urban areas of Kenya and determine how this impacts on attitudes and practices towards diabetes. A face-to-face interview was performed for selected respondents using a structured questionnaire for data collection. Of 1982 respondents, 1151 (58%) were female and 831 (42%) male and age ranged from 13 to 65 years. There were 539 (27%) with a good knowledge of diabetes; of these 52% had tertiary education; 25% had secondary education, and 14% and 9% had primary and no education, respectively. Only 971 (49%) of the respondents had a positive attitude towards diabetes, while 813 (41%) demonstrated good practices towards diabetes. This study indicated that the level of knowledge of diabetes was poor. It also indicated poor attitudes and practices of the community towards diabetes. A comprehensive nationwide diabetes education programme is necessary to improve this situation.

## Background

The International Diabetes Federation (IDF) estimated the prevalence of diabetes in Kenya to be about 3.3% in 2007.<sup>1</sup> However, local studies have shown a prevalence of 4.2% in the general population with a prevalence rate of 2.2% in the rural areas and as high as 12.2% in urban areas. The prevalence of impaired glucose tolerance is equally high at 8.6% in the rural population and 13.2% in the urban population.<sup>2</sup>

Urbanisation with adoption of 'Western lifestyles' has been incriminated in the abandonment of the healthier 'traditional lifestyles' by people in developing countries. The traditional lifestyle was characterised by regular and

vigorous physical activity accompanied by subsistence on high fibre whole grain-based diet, rich in vegetables and fruits.<sup>2,3</sup> Urban or even 'Western lifestyles' in rural areas have resulted in over-reliance on motorised transport and consumption of unhealthy diets rich in carbohydrates, fats, sugars, and salts.<sup>4</sup>

These lifestyles have contributed to a rise in levels of obesity and overweight in the population, hence increasing the risk for diabetes. For instance, in the 2003 Kenya Demographic and Health Survey about 20% of women and 7% of men in the country were overweight or obese.<sup>5</sup> Recent studies have shown even higher figures of 60.3% and 19.5% for women and men, respectively, in urban areas as compared with 22.6% and 10% in women and men, respectively, in rural areas.<sup>6</sup>

The rise of these determinants of chronic diseases reflects the major forces driving social, economic, and cultural change in Kenyan society. These same factors are driving the epidemiological landscape with chronic non-communicable diseases becoming major contributors to the national disease burden.<sup>3</sup>

Diabetes is now emerging as an epidemic of the 21<sup>st</sup> century. It threatens to overwhelm the healthcare system in the near future.<sup>7</sup> Sadly, the majority of the people with diabetes in developing countries are within the productive age range of 45–64 years.<sup>3</sup> These are the same individuals who are expected to drive the economic engines of their countries in order to achieve the agreed international development goals. Besides their reduced productivity, diabetes further imposes a high economic burden in terms of healthcare expenditure, lost productivity, and foregone economic growth.<sup>3</sup>

To curb this scourge of diabetes, public health interventions are required to prevent diabetes or delay the onset of its complications. This will entail intensive lifestyle modification for those at risk of diabetes and aggressive treatment for those with the disease.<sup>8</sup> A high-risk approach targeting individuals at risk of diabetes and a population or public health approach aimed at reducing the risk factors for diabetes at the community level are necessary.

Knowledge is the greatest weapon in the fight against diabetes. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease.<sup>9</sup> It

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is therefore in the interest of the country to design and develop a comprehensive health promotion strategy for diabetes and its related risk factors. It is equally important to design and implement suitable diagnostic, management, and treatment protocols for people with diabetes.

This study, therefore, was conducted to assess the level of community awareness of diabetes and how this knowledge influences attitude and practices in prevention and control of the disease. The findings may help in identifying population knowledge gaps, and behaviour towards diabetes, which will guide the development of prevention programmes in the country.

## Patients and methods

This was a descriptive cross-sectional study involving 2000 people drawn from eight districts in four provinces. The four provinces were selected from a total of eight due to their high burden of diabetes as reported in the health management and information systems in the Ministry of Health. Two thousand (2000) respondents was considered adequate as similar studies done in the country have worked with similar numbers. The four provinces had a total of 23 districts and the districts were stratified into rural and urban districts based on their geographical location. Two districts, one rural and one urban, were randomly selected from each province. Each of the eight districts was assigned 500 respondents. The respondents were aged between 13 and 65 years. Only one respondent was interviewed for every household visited.

A medium-sized four-part questionnaire was designed by the researchers. It was peer reviewed by five colleagues including a biostatistician for validation of the questions. The questionnaire was then piloted on ten respondents in Kajiado district which is a rural district next to Nairobi. This was done in order to assess the suitability of the contents, clarity, sequence, and flow of the questionnaire. The questionnaire was then refined for final use. All questionnaires were in English, which is the national official language.

The first part of the questionnaire covered the respondent's demographic information which included: name, age, sex, level of education, occupation, and average monthly income.

Part 2 covered knowledge about diabetes. Knowledge on causes of diabetes was based on responses to a question on what they knew to be the cause of diabetes. The options given were: lack of insulin, failure of the body to use insulin, consumption of lots of sugar, or don't know. For knowledge about signs and symptoms of diabetes, five options were given: frequent urination, excessive thirst, excessive hunger, weight loss, and high blood sugar. Knowledge of complications of diabetes was assessed by asking respondents to describe complications of the disease they knew. Options listed included: loss of vision, kidney failure, heart failure and stroke, poor wound healing, and amputation. Respondents' knowledge of diabetes was categorised as either good or poor depending on their responses to the knowledge

areas assessed.

Part 3 of the questionnaire assessed the attitude of the respondents towards lifestyle characteristics such as diet, physical activity, and health-seeking behaviour.

Part 4 assessed what the respondents practised in terms of adopting healthy lifestyles that promote diabetes prevention. This section looked at consumption of healthy diet, regular physical activity, avoidance of alcohol and tobacco use, and regular medical checkups.

The questionnaire was administered by interviewers who were people with a medical background knowledge of diabetes and included nurses, clinical officers, and nutritionists. Before going to the field, the interviewers were taken through a one day training to acquaint themselves with the data collection tools and also to understand the whole concept. The interviewers then embarked on data collection by moving from house to house within their allocated areas. The first person to be encountered in the household meeting the age criteria was interviewed. For those who declined, a second person was interviewed and in their absence the next household was visited.

All completed questionnaires were then submitted to the survey supervisors who checked their completeness before the interviewer left that area. Where information was missing the interviewer revisited the respondent for further information unless they had initially declined to disclose. Upon processing of all the field data, analysis was done under the domain of descriptive statistics using SPSS software.

## Results

Of the targeted 2000 respondents, 1982 (99%) were interviewed in this study. There were more females 1151 (58%) than males 831 (50%) interviewed. There were 358 (18%) of the respondents who had tertiary education; 737 (37%) had secondary education, 725 (37%) had primary education, while 162 (8%) had no education at all.

Only 575 (29%) of respondents had good knowledge of signs and symptoms of diabetes while 1407 (71%) of respondents had poor knowledge of what diabetes is. Only 518 (26%) could correctly identify the probable causes of diabetes; 523 (26%) of the respondents could identify complications of diabetes, and 1459 (73%) had very little or no knowledge of complications of diabetes (see Table 1). Overall, 539 (27%) of respondents had a good knowledge of diabetes. There was no significant difference in knowledge levels between genders – the proportion of females with good knowledge was 27% compared with 28% in males.

*Table 1 Levels of community knowledge on different aspects of diabetes*

Knowledge of diabetes	Signs and symptoms	Causes	Complications
Good	575 (29%)	518 (26%)	523 (26%)
Little or none	1407 (71%)	1464 (74%)	1459 (73%)
Totals	1982 (100%)	1982 (100%)	1982 (100%)

### Regional differences in level of knowledge

Results revealed a significant disparity in the level of knowledge in different regions. Coast province had the lowest knowledge level of diabetes (24%) followed by Nairobi (25%), Eastern (29%), and Central (31%), respectively. Over 70% of all respondents from each of the four regions had poor knowledge of diabetes (see Table 2).

Table 2 Regional differences in level of knowledge

Province of residence	Community knowledge	
	Good	Poor
Nairobi	127 (25%)	372 (74%)
Coast	118 (24%)	380 (76%)
Eastern	140 (29%)	345 (71%)
Central	154 (31%)	346 (69%)
Total	539 (27%)	1443 (73%)

### Variation of knowledge of diabetes with level of education

All the respondents with good knowledge were analysed according to level of education. A direct relationship between level of education and good knowledge of diabetes was demonstrated – 52% of those who had good knowledge had tertiary education, 25% had secondary education, and 14% had primary education, while 9% had no formal education.

### Community attitude and practices towards diabetes

To assess the attitude of the community towards diabetes, the attitude of people towards lifestyle characteristics such as diet, physical activity, and health-seeking behavior was assessed. Only 28% of respondents agreed with statements relating to willingness to engage in physical activity, changing eating habits, and maintaining a good body weight. A significant 813 (41%), of the respondents did not indicate any willingness to adopt these healthier lifestyles, and 59% had bad practices in relation to diabetes prevention. There were 75% of the people interviewed with poor dietary practices, 72% did not participate in regular exercise, and over 80% did not monitor their body weight.

### Relationship between practices and knowledge

Further analysis of the relationship between community knowledge and practices provided valuable insights in the assessment of community attitude. Thus 51% of people with a good knowledge of diabetes had good practices as compared with 37% of people with poor knowledge of diabetes. Conversely, 49% of those with good knowledge had bad practices compared with 63% of those with poor knowledge (see Table 3).

### Discussion

Most studies on the knowledge, attitude, and practices of diabetes carried out in Africa and elsewhere target patients with diabetes. In contrast, this study targeted the general population. The findings reveal a serious

Table 3 Relationship between community knowledge and practices

		Community practices	
		Good	Poor
Community knowledge level	High	273 (51%)	266 (49%)
	Poor	540 (37%)	903 (63%)
Total		813 (41%)	1169 (59%)

deficiency in knowledge of diabetes among community members in Kenya. Only 27% of the people interviewed had a good knowledge of diabetes. Puepet and colleagues found a similar level of knowledge of diabetes (30%), among patients with diabetes in Jos State, Nigeria.<sup>10</sup> Upadhyay and colleagues, in a study in western Nepal, noted a lack of awareness of diabetes even in patients who had had the disease for a long time.<sup>11</sup> Even in a developed country, Baradaran and Knill-Jones found that knowledge about diabetes amongst ethnic groups in Glasgow was very low.<sup>12</sup>

These findings underscore very important aspects of providing diabetes education to the community. Firstly there is a historical deficiency in knowledge about diabetes and inequalities in the quality of education reaching each region in the country. Similar findings were documented in Pakistani Muslims attending a UK Diabetic Centre.<sup>8,13</sup> Secondly, the low level of community knowledge of diabetes reflects on the extent of health promotion for most chronic non-communicable diseases. At the moment, there are no comprehensive primary care programmes for diabetes in the country and diabetes health education is done within health facilities through micro-teaching, and only targets those with diabetes. This therefore leaves the rest of the public ignorant of the disease. Most diabetes health promotion efforts by different stakeholders are uncoordinated, and the messages are not standardised due to lack of clear guidelines regarding diabetes education.<sup>12</sup> Lastly, there is even a low knowledge of diabetes among healthcare workers who are expected to deliver health education to the community.<sup>14,15</sup>

Diabetes prevention interventions need to target health education directed to the community and the healthcare providers. Good knowledge of diabetes amongst carers is likely to be directly related to the quality of care given by such providers. Education of patients, likewise, improves compliance with treatments and may lead to favourable treatment outcomes. This is due to the direct influence of knowledge on the attitude and practices of both the carer and the patients.<sup>16</sup>

Over 49% of those with good knowledge had poor practices as far as diabetes is concerned. Poor knowledge of diabetes in the community may result in poor attitudes. However, this does not explain poor practices in people with good knowledge of the disease. Al-Tamimi and Peterson demonstrated that women continued to consume sweetened foods, even though they knew about the deleterious impact of sugar on oral and dental

issues.<sup>17</sup> Knowledge does not always result in behaviour change and needs to be reinforced.<sup>18</sup>

Since the knowledge referred to in this study was the conventional form obtained from formal information, communication, and education systems, the reason for good practice among 37% of people with no knowledge was associated with their indigenous knowledge. It is therefore important to identify interventions that reinforce peoples' attitudes despite their levels of knowledge of a particular subject.<sup>19</sup> Proper education and awareness programmes have previously been shown to change the attitude of the public regarding diabetes. Improving knowledge of the people can improve their attitude towards diabetes and in the long run change their practices to embrace healthier lifestyles.<sup>20</sup> Such practices may minimise the risk of diabetes in the general public and delay the onset of complications in those already with diabetes.

There is a need for further in-depth studies to investigate the social and cultural beliefs of health in Kenyan communities. These beliefs have reinforced unhealthy dietary habits even though people are aware of the relationship between these practices and chronic diseases such as diabetes.<sup>21</sup>

There were marked regional discrepancies in the level of knowledge. These differences do not imply in any way that there is deficiency in intelligence in the different regions, but only a lack of exposure to knowledge about diabetes, inaccessibility of good healthcare services, and also low literacy levels in some areas. This has previously been noted among patients with diabetes in a primary healthcare setting in South Africa<sup>9</sup> and among Pakistani Muslims with type 2 diabetes in Manchester, UK.<sup>13</sup>

Preventing disease potentially avoids and certainly postpones suffering and may have many other benefits that are difficult to quantify, e.g. impact on families, which may make it preferable to treatment. This study forms a baseline for the national diabetes awareness campaigns and demonstrates a wide knowledge gap which requires a concerted effort by those involved with diabetes management and education. A systematic education curriculum for diabetes education is essential for all levels of healthcare, from the community to the highest referral level. The community health education interventions for diabetes need to take into account the disparity and uniqueness that exist between gender, age groups, and regions.

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