KNOWLEDGE, ATTITUDES, AND BEHAVIOR RELATING TO DIABETES AND ITS MAIN RISK FACTORS AMONG URBAN RESIDENTS IN CAMEROON: A QUALITATIVE SURVEY

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Diabetes, obesity, and physical inactivity are common in urban areas in sub-Saharan Africa. This paper reports an investigation of lay knowledge, attitudes, and behaviors relating to diabetes and its main risk factors of urban Cameroonians.

We carried out a qualitative study in four urban health districts, one from each of the main ecological areas of Cameroon. Participants were purposively selected to include a range of community key participants and articulate community members. Data were collected through in-depth interviews by using a pre-tested, semi-structured interview guide.

Sixty-two interviews were conducted across the four sites. Awareness of diabetes and knowledge of its causes, clinical course, and complications were limited. Many participants believed diabetes was caused by excessive sugar consumption rather than excessive energy intake, obesity, or physical inactivity. Obesity, particularly in men, was largely perceived positively as a sign of ''good living.'' Many participants underestimated the degree to which they were overweight. Physical activity was mostly viewed positively, although negative views were common about simple methods of increasing physical activity, such as walking. Several constraints to the adoption of healthy behaviors were identified. For diet, these included lack of knowledge of the composition of a healthy diet. Barriers to undertaking more physical activity included lack of facilities and inadequate time available.

The results indicate the need for health education about diabetes and its main risk factors in these communities. Health education should be informed by lay perspectives to maximize the appropriateness of the messages and their effect on knowledge, attitudes, and behavior. (*Ethn Dis*. 2006;16:503–509)

Key Words: Cameroon, Diabetes, Health Beliefs, Knowledge, Perceptions, Risk Factors, Urban

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INTRODUCTION

Changes in demographic status, development, urbanization, and the impact of globalization have resulted in the rapid emergence of noncommunicable diseases (NCDs) and their risk factors in sub-Saharan Africa, particularly in urban areas. By 2020, NCDs are projected to outstrip communicable diseases as a cause of death.[1] In Cameroon, diabetes, hypertension, cardiovascular disease (CVD), and stroke cause increasing numbers of illnesses and deaths. Noncommunicable diseases (NCDs) are the most common cause of death among people ≥50 years of age; they cause 35% of all deaths in this age group.[2] Studies between 1994 and 2003 have shown a steadily increasing prevalence of NCDs.[3–6] In a survey of four urban areas in 2003, age-standardized prevalences among adults age >25 years was 6% among men and women for diabetes and 29% and 31% respectively among women and men for hypertension.[6] The age-adjusted prevalence of overweight or obesity (BMI >25 kg/m^2) was 50% in women and 31% in men. Nearly 70% of adults were physically inactive at work, and 90% reported no physical activity during leisure time.[6] This context provides compelling arguments for piloting and implementing culturally appropriate prevention and control interventions.

The aim of this study was to investigate lay knowledge, attitudes, and behaviors relating to diabetes and its main risk factors in urban Cameroonians.

The aim of this study was to investigate lay knowledge, attitudes, and behaviors relating to diabetes and its main risk factors in urban Cameroonians. The study was conducted as part of a baseline survey for a program aiming to establish demonstration sites for a Cameroon diabetes prevention and control program: CAMBoD (Cameroon Burden of Diabetes Project).

METHODS

Study Design

The investigation was an exploratory and descriptive qualitative study. Qualitative methods were used to explore in depth lay people's knowledge, attitudes, and behaviors relating to diabetes and diabetes risk factors.

Subjects and Setting

The population of Cameroon based on projections from the 1987 census is 15.5 million, with an average density of 31.8 inhabitants per square kilometer. English and French are the two official languages, but many local languages are

also spoken. Cameroon has a diverse geography ranging from an Atlantic coastal ecosystem in the south, through dense equatorial forest and high plateau zones in the middle, to the semi-arid Sahelian region in the north. Participants were chosen from four CAMBoD study areas: Cité des Palmiers Health District in Douala for the coastal region, Biyem Assi Health District in Yaoundé for the forest region, Bamenda Health District for the savannah region, and the Garoua Urban Health District for the Sahelian region.

Interviews were conducted with articulate community members chosen purposely from communities covered by the sampled health districts and selected through a cascade procedure. To avoid an over- or under-sampling of some subpopulations and to capture a broad cross-section of people from each community, participants were selected to achieve a mix of sexes, age groups, educational levels, and socioeconomic positions. Selection criteria for participants included that they had lived at least six months in the community, were nominated by other community members, and were age ≥15 years. We excluded health personnel because their views were likely to be informed by their training and practice. Approximately 15 interviews were anticipated per site, though recruitment ceased when no additional themes emerged from interviews. Fieldwork for the study took place between July and October 2003.

Data Collection

Data for this study were collected through in-depth interviews with participants. All interviews were administered face-to-face by an experienced researcher, assisted by a trained research assistant. Interviews were conducted in either French or English depending on the subject's preference. All interviews were tape-recorded. A pre-tested interview guide was used to facilitate interviews. The interview aimed to collect data on subjects' knowledge, attitudes, and behaviors relating to diabetes and its risk factors and also their views of common lay beliefs within their communities.

Case definitions of key terms such as diabetes, overweight and obesity, physical activity, and healthy diet were not given during the interviews. The study was interested in collecting participants' views, understanding, definition, and daily applications of these terms. Anthropometric measurements (height and weight) of each participant were taken to calculate body mass index (BMI).

Data Management and Analysis

Interviews were transcribed verbatim. Transcripts were checked for completeness and internal coherence and then imported into Ethnograph version 5.0 (Qualis Research Associates, Denver, Colo) for analysis. During analysis, key themes and variables were identified, coded, and classified according to code trees constructed from the data. Complementary summary matrices were generated to assist the computer-based coding and analysis process. In the follow-up analysis, coded data were used to convey levels of knowledge relative to diabetes and its risk factors, portray mainstream health beliefs, and indicate the distribution of views, perceptions, and practices. Finally, a content analysis technique was applied in which categorical information served as a basis for deductive conclusions. The data are presented globally and generally, and not by subsample categories. However, where views between subsample categories were markedly different, such differences are described in the results section. Where such distinctions are not highlighted, views did not obviously differ by subcategories.

Ethical Consideration

Ethical clearance for the study was granted by the National Ethics Committee. Informed consent was obtained from each participant and permission was sought to audiotape the interviews. Participants were assured confidentiality of all information. All data, including the audiotapes, were stored securely with identifier information removed.

RESULTS

Characteristics of Participants

Sixty-two interviews were conducted across the four sites. Among those interviewed, 27 were women and 35 were men. Interviewees included 8 religious leaders, 10 teachers, 9 public functionaries, 8 youth leaders, 4 politicians, 11 housewives, 5 retired workers, and 7 restaurant and bar operators or other informal sector businessmen. Two participants were known diabetics, seven known hypertensives, and one had suffered a minor stroke. Seventeen were age 15–39 years, and the rest were ≥40 years. More than half of the participants were overweight and obese: 40% overweight (BMI >25–30 kg/m^2) and 17% obese (BMI >30 kg/m^2). Ten percent of the participants had no formal education, 30% had completed primary education, 40% secondary education, and 20% had undertaken post-secondary studies. More than 50% of the participants were in the informal economic sector, 30% were in the formal sector, and the rest were unemployed or under pension schemes.

Awareness, Understanding of Causality, and Clinical Knowledge about Diabetes

Most participants had heard of diabetes but had limited knowledge of its risk factors or how it is acquired. Among those who claimed knowledge of diabetes, the most common beliefs about cause were that it is acquired: through genetic inheritance; through birth from mother to child; or most commonly, through lifestyles that involve high consumption of sugar and sugar-related products. Some believed that diabetes could be transmitted sexually. In all four sites, diabetes was

commonly defined as the ''sugar disease,'' and a diabetes patient was seen as ''one suffering from too much sugar in the body.'' Sugar was perceived to be derived essentially from sweet foodstuffs. Most subjects believed that local soft drinks were potential causative agents. Participants, especially the women, noted that their peers preferred alcoholic drinks to soft drinks in social gatherings because they feared the soft drinks would put them at greater risk of diabetes. Few people understood that polysaccharides and starches are converted to glucose and glycogen even from unsweetened foods and drinks.

Few informants categorized diabetes as a chronic condition. Many believed diabetes could be cured especially by traditional therapy. Knowledge of complications was low and sometimes completely absent. Participants therefore tended to perceive the threat to health posed by diabetes as low. Similarly, knowledge of symptoms was limited. Some, notably those who had diabetes or relatives with diabetes, cited symptoms such as frequent urination, thirst, headaches, fatigue, and malaise. Most informants (93%) had never had a blood sugar test, although based on age and BMI, most appeared to be at risk.

Prevention of Diabetes

Most participants believed that since diabetes is caused by excessive sugar consumption, the logical way to prevent it was to reduce sugar intake. Some believed that high blood sugar (diabetes) could be neutralized by drinking very bitter herbal liquids. Informants stated that some community members used this as a reason to drink beer with a bitter taste to help control, or reduce the chance of developing diabetes. Some participants thought that people with diabetes should consume honey in the place of sugar as it did not raise blood sugar.

Many participants believed that diabetes could not be prevented or viewed living a precautionary lifestyle to be unrealistic. One subject observed, ''life itself is a risk, one cannot be too careful about it.'' Even some who claimed knowledge about diabetes believed the condition could not be prevented because complying with the recommended lifestyle measures was too difficult.

A few participants (notably those with diabetes or whose relatives had diabetes) appeared fairly knowledgeable about how to prevent diabetes. They variously cited regular physical exercise, balanced and moderate diets, reducing body weight, blood pressure, and blood sugar control. A few, while limited in knowledge, expressed willingness to learn about and comply with recommended preventive measures. However, most subjects admitted that people generally do little or nothing to prevent diabetes and that lifestyle modifications required to prevent the disease were unknown to or simply not possible for most ordinary people.

Beliefs and Knowledge of Risk Factors

Overweight and Obesity

Most participants believed that obesity was a sign of good living. A few described it as a sign of good health. Local jargon used to describe abdominal obesity included expressions such as ''ventre administrative'' (executive belly), ''ventre de commandement'' (commanding belly), ''tycoon,'' and ''cémetière de poulet'' (chicken cemetery). Women with central obesity (high waist-hip ratios) were described as those with ''vraie ndombolo'' (true buttocks), ''large debat'' (big discussion), or ''large backyard.'' Only one of all these expressions was used pejoratively, while the rest were regarded as positive attributes.

Asked about motives for trying to lose weight, participants declared that fat people, notably women, want to lose weight more because of a desire to enhance beauty, look smart, and be able to dress up rather than to achieve better health. Where obesity was viewed negatively, it was associated with causing difficult breathing, headache, fatigue, and uneasiness; restricting activity; and being unattractive. Hardly any subjects thought there was an association between obesity and diabetes or between other major risk factors such as physical inactivity or poor diet and diabetes. However, participants acknowledged that obesity was linked with hypertension.

Participants generally viewed low body weight negatively, seeing it as a sign of poverty, malnutrition, ill health, and HIV/AIDS. Most women preferred not to be too obese, although they disapproved of women who are too thin. Participants reported that in some Cameroonian cultures, slim young girls recently married are expected to fatten up before relocating into their marital homes or are expected to do so soon after joining their husbands. If the woman does not gain weight, the community will interpret it as a sign of poor treatment from the husband. Some female participants argued that being thin was perhaps good for women but not men, as men ought to be authoritative and imposing, which is unlikely for men who are slim.

Most people who were overweight (BMI 25.1–30 kg/m^2) believed they had normal weight, while most people who were obese (BMI >30 kg/m^2) believed they were just slightly overweight. Some with normal weight (BMI 20–25 kg/m^2) believed they were underweight and needed to put on weight. Normal weight was subjectively defined as ''when somebody is physically not too fat or small,'' while overweight and obesity were construed as being ''physically fat and excessively physically fat,'' respectively. A few participants believed that normal weight, overweight, and obesity were a function of height. Most overweight and obese participants when told what their normal weights ought to be, disagreed because losing so much

weight would mean exposing them to undue public scrutiny and suspicion of having HIV. Overweight and obese men and women had little or no differences in their views of obesity from the other categories of participants and across these groups; participants frequently referred to excessively fat people (obese) as overweight individuals.

Some participants were fatalistic about obesity, believing that, like height, the size of one's body cannot and should not be changed because it is "God given"; or as one informant put it, "in our family we all are fat people. It is a family gene. No matter what I do, I don't believe I can reduce my size." Few informants (8%) had scales at home, though some had had their weight measured during consultations in a health facility or by street vendors. Some informants measured their weight primarily not to inform weight control but just to track any changes in weight.

Physical Inactivity

Across the different subgroups, participants believed that physical exercise was good for health. Physical exercise was also seen as a way of cleansing and restoring balance in the body. One informant said, "exercise is good, it enables the body to release its bad liquids in the form of sweat." Informants were nearly unanimous in their opinion that people of all age groups need regular physical exercise. However, few participants associated physical inactivity with developing diabetes.

Participants, mainly those from the older group (≥40 years), thought that people about their age could be encouraged to do light exercises such as brisk walking and jogging, while young people should do more vigorous exercises such as football and athletics. Although participants acknowledged the health benefits of physical activity, most admitted they did not engage in any, regularly or irregularly. They felt that lack of time, poor infrastructure, ignorance, and poverty prevented urban residents from engaging in more exercise. However, they believed that awareness of the need for physical activity was increasing, evidenced by the growing number of people they observed doing sports, particularly during leisure time on weekends.

The importance attached to less strenuous activities such as walking was low because of negative cultural beliefs associated with it. For instance, walking was believed to be a sign of poverty and hence regarded as demeaning, particularly among city dwellers. Walking for pleasure (strolling) was uncommon and was associated with idleness. Across the sample, participants were more likely to use their own transportation, hire a taxi, or ride a motorbike. One man observed, "If I'm seen walking across town, my friends will laugh at me. They won't bother to ask me why." Another said, "Sincerely, I'll only walk when I lack the money." So most of those walking in cities do so out of necessity and not by choice. Other more routine forms of physical activity such as cleaning the yard, domestic chores, dancing, tilling, and planting were not thought to represent true physical activity.

Diet

Most of those interviewed had heard of healthy and/or balanced diets but most were uncertain of what this meant. Some defined a balanced diet as one that included elements from all the food groups. A few said a balanced diet was one that included fruits and vegetables. Participants were asked if they had a balanced diet, which prompted a variety of responses. Many thought that a balanced diet was hard to sustain because of practical difficulties (despite their good intent). Some, especially the older participants, said they were doing their best to eat fruits or fruits and vegetables. Many noted that diets had changed greatly with modernization and the importation of foreign foods. One informant stated "more people now fry their foods instead of boiling or roasting them as in the past while the consumption of tinned foods, cheap imported chicken and animal butter such as margarine, is now very common practice everywhere in Cameroon." Most participants attributed the development of diabetes to excessive sugar intake. Few identified any link between fatty foods and diabetes. One female informant remarked: "I try hard to reduce my consumption of sugar in order to prevent diabetes." Participants linked recent dietary changes in the population to poor health outcomes, but only a few thought dietary changes were associated with an increase in the incidence of diabetes.

Seasonal variation in availability of fruits and vegetables was reported as an important factor determining their consumption. However, other participants, especially those in the Sahelian north where rain is often scarce, asserted that a shift to farming in new settings, such as marshes, was reducing the importance of seasonality, making fruits and vegetables available and fairly affordable throughout the year. Importation of exotic fruits such as apples did not solve the problem of seasonal scarcity, as they were too expensive for locals and not widely consumed. Financial difficulties, cultural barriers, and lack of education were other factors mentioned that prevented people from diversifying their food intake and eating a healthy diet.

In some sites, notably Bamenda and Garoua, most people were said to eat only what they could produce from their own farms. In addition, food habits were said to be deeply ingrained; people stick to traditional staple diets. Some participants believed that the ecological conditions would allow their communities to diversify what they grew and hence consume a balanced diet; however, they lacked the necessary education to do so. Other participants felt that purchasing power would have to increase to enable their communities

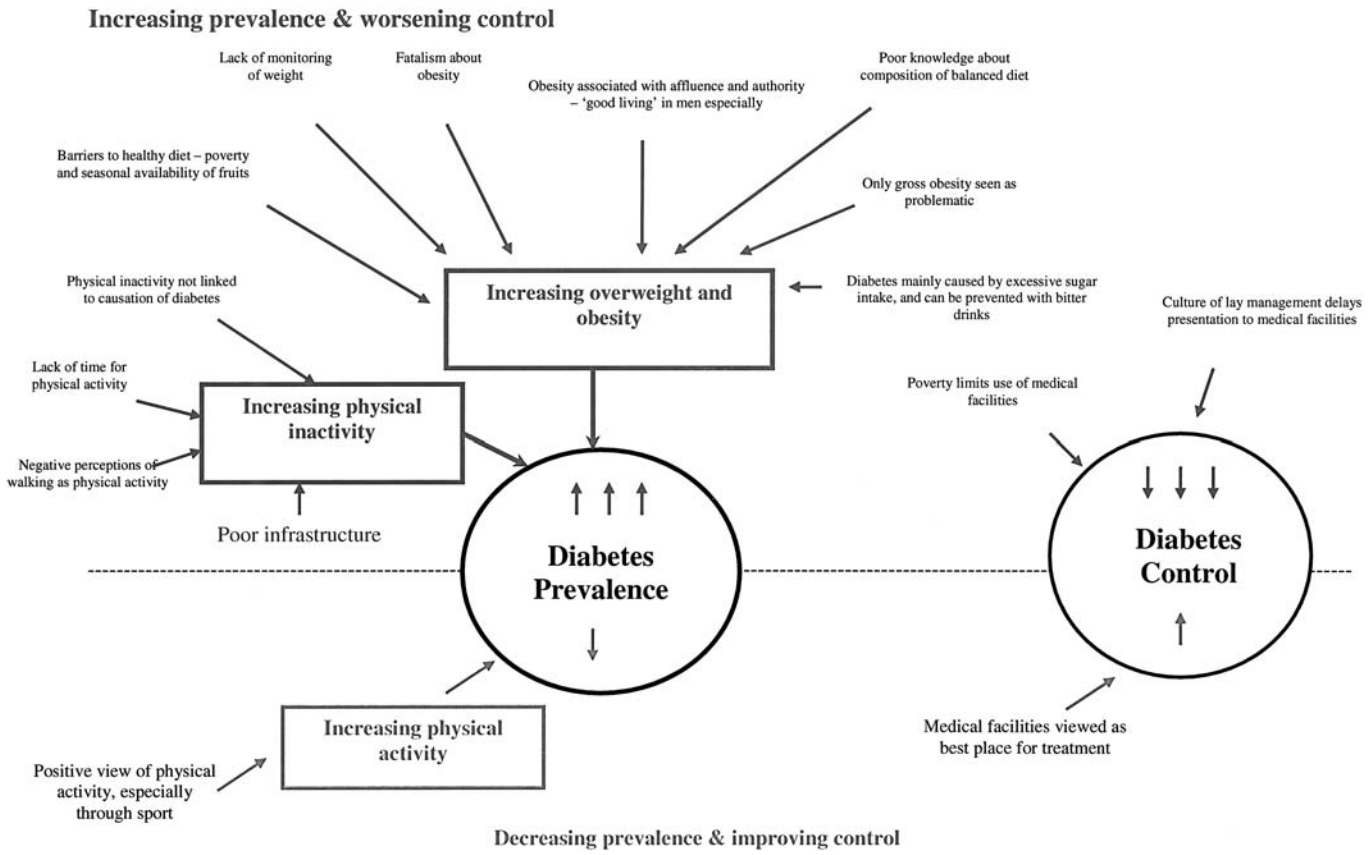

Fig 1. Lay health beliefs and their impact on the prevention and control of diabetes in four urban areas of Cameroon

to buy the fruits and vegetables required for a balanced diet.

Treatment-seeking Behaviors

Most participants believed that the ideal place to seek treatment for general health care, including diabetes, was a modern healthcare facility. However, people often reported seeking alternative or complementary treatment from folk healers and other sources, mainly because they lacked money to pay health service bills. Money was seen as a major determinant of where, when, and which kind of treatment is sought during illness, and poverty was thought to limit people's ability to afford good health care. Participants stated that most people only access modern health services during a crisis. People were thought to use traditional therapies because of beliefs about the causes of their ill health, and a strong cultural attachment to initial home management of poor health. Formal consultation at a health facility might follow if poor health becomes protracted. In Garoua, home management for symptomatic relief was believed to be essential because patients taken to the hospital were thought likely to die. Presumably, because people waited as long as possible before going to the hospital, the probability that they would die at the hospital increased.

DISCUSSION

This study is one of the few qualitative assessments of health beliefs related to diabetes, its risk factors, and health care from sub-Saharan Africa.[7] The study reveals a strong interplay between health beliefs, knowledge, lay perceptions, and health behavior (Figure 1).

Due to their beliefs, many people were not motivated to take action to reduce their risk of diabetes by increasing activity, changing their diet, and losing weight. In addition, because of lack of knowledge, lay beliefs about causation and treatment, and financial barriers, illness was likely to be managed at home or traditional healers would be consulted, delaying presentation to health services.

The belief that obesity is a sign of good living derives from local perceptions of obesity as an indicator of affluence and status. Renzaho has observed that elsewhere in sub-Saharan Africa, cultural exposure to a life of deprivation and destitution influences the way body weight is socially constructed and positioned. The findings suggest that where basic subsistence is still

a common problem, traditional perceptions and cognitive imagery about obesity are unlikely to alter significantly.[8]

Although urban residents were aware of the importance of physical activity for health, they were generally not committed to doing regular physical exercise, and looked down on mundane physical activities such as walking. With increasing levels of unemployment, most urban Cameroonians may be preoccupied with securing employment or finding food and shelter than engaging in physical exercise. With rural-to-urban migration very common in Cameroon, most urban residents are people who have moved from a physical activity-enhancing environment to one that promotes a sedentary lifestyle. Little accessible infrastructure supports physical activity, such as sports grounds, gyms, playgrounds, parks, and even pavements for pedestrians and roads that are safe for cyclists. Findings suggest that health education messages could raise the awareness of the potential benefits of regular physical activity.

That participants stated that their communities have the resources to improve on their diet but are unaware of what to do demonstrated a gap in nutritional knowledge among ordinary Cameroonians. Nutritional policy in Cameroon has focused on targeting micronutrient deficiencies and malnutrition. Historically, these have been the main challenges and undoubtedly a major contributor to poor health in the country. As a result, little attention has been focused on tackling overfeeding, overweight, or obesity. This finding is common in sub-Saharan African countries, where the situation has been described as a complex coexistence of both malnutrition and obesity in spite of the prevailing poor socioeconomic status.[8]

Our data have some limitations. Given that our research strategy necessitated purposive rather than random sampling as well as the relatively small number of participants, our data may not be representative of all views across the urban population. Although a range of educational levels was included in the study, overall this group was relatively well educated. Although we are confident that they are in touch with the dominant views in their communities, we cannot be sure that they captured the full range of lay beliefs and attitudes.

Although urban residents were aware of the importance of physical activity for health, they were generally not committed to doing regular physical exercise, and looked down on mundane physical activities such as walking.

Participants may have responded to our questions with what they considered to be the socially desirable answers. We minimized this possibility by taking a nonjudgmental approach during the interviews and by frequently focusing our questions on the beliefs of the participant's family and friends and community members, rather than of the participants themselves. The robustness of the responses, many in opposition to the accepted tenets of medical science about diabetes and its risk factors, suggests that social desirability bias was not a major problem.

CONCLUSIONS

This study provides us with a basic understanding of diabetes and health beliefs linked to the disease among urban residents in Cameroon. The findings highlight the importance of understanding lay beliefs and demonstrate the importance of anthropological perspectives and in-depth qualitative research to complement the findings of quantitative epidemiologic research in informing the development and delivery of programs to prevent and treat chronic diseases like diabetes, especially in Africa, where health outcomes are highly dependent on cultural variables.[7]

The study will provide the groundwork for further investigations on the relative importance of various health beliefs toward a cultural understanding of diabetes in Cameroon. Complementary, scientifically robust quantitative studies will be necessary to determine the strengths and weights of various health beliefs and the distribution of predominant health beliefs at the population level and by population characteristics. Specific work planned includes the development of a diabetes health belief interview schedule for use in quantitative work within the CAMBoD project. The findings of this study will inform the development of health promotion activities and health education materials within the project and patient education materials for use in clinics supported by the CAMBoD program.

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