Original Research Article

Nutritional Knowledge and Nutritional Status of Diabetes Type 2 Patients in Kikuyu Mission Hospital, Nairobi, Kenya

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ABSTRACT

Introduction: Diabetes is now a pandemic of world concern affecting both developed and developing countries. Dietary intake and nutritional status of a person are considered key in the prevention and management of diabetes. Increasing awareness and knowledge about diabetes among the diabetics and the population at large is also considered paramount for its prevention, treatment and management. In Kenya, diabetes is on the increase in both rural and urban settings. Unfortunately, there is scanty information in Kenya on nutritional knowledge and nutritional status among diabetic patients. The study thus aimed at determining the nutritional knowledge and nutritional status among diabetes type 2 patients in Kikuyu Mission Hospital, Nairobi, Kenya.
Materials and Methods: This was a cross-sectional analytical study that involved 153 diabetic type 2 patients attending Kikuyu Mission Hospital, Nairobi, Kenya.
Results: The study revealed low nutritional knowledge (69.3%) and high prevalence of obesity (50.9%) among the respondents. Additionally, statistically significant association between nutritional knowledge and nutritional status of the respondents was observed (P < 0.05).
Conclusion: The low level of nutritional knowledge revealed in this study demonstrates the need to scale up community interventions programs enhancing nutritional knowledge among diabetic patients. Regular screening of high risk persons should also be initiated and people should be advised to adopt healthy lifestyle for prevention and control of diabetes mellitus.

Keywords: Diabetes, Nutritional Knowledge, Nutritional Status, Overweight, Obesity.

INTRODUCTION

Diabetes has become one of the biggest health concerns affecting the world. [1-3] WHO defines diabetes as a chronic disease that results either when the pancreas does not produce enough insulin or when the body cannot effectively utilize the insulin it produces. Diabetes mellitus is the most prevalent type of diabetes which is characterized by hyperglycemia. [3] Available substantial evidence indicates that diabetes is an epidemic affecting many developing and newly industrialized nations. [4] According to International Diabetes Federation (IDF), one in 11 adults has diabetes. Furthermore, it is estimated that around 415 million people had diabetes as of 2015. This number is expected to rise to 642 million people by 2040. In Africa 14.2 million have diabetes and by 2040, 43.2 million will have diabetes. Notably, In Africa more than two thirds of people with diabetes are undiagnosed. In Kenya, there were 478, 000 cases of diabetes as of 2015. [5]

Several modifiable risk factors come to fore as driving forces of the current upsurge of type II diabetes in many

countries Kenya being included. These factors associated with urbanization include; consumption of refined carbohydrate, consumption of high-fat diets, lack of adequate physical activity due to sedentary lifestyles, lack of exercise or circumstantial reduction of physical exercises occasioned by the availability of motorized transport, watching television and computer games for long hours. [6-8] Lack of adequate nutritional knowledge, poor dietary practices and obesity contribute greatly to high prevalence of diabetes in Kenya. [9] These changes in human behavior and lifestyle have largely lead to the rising prevalence and incidence of diabetes in both rural and urban settings. [1] The understanding of risk variables associated with type 2 diabetes is very crucial for its prevention, better management and effective treatment. [10]

Dietary management of type 2 diabetes among patients is one way to prevent or delay the long term effect of the condition. Diabetic individuals worldwide are routinely advised to adopt a healthful eating behavior, which requires modifications in food habits, beliefs and meal patterns on a lifelong basis. [6] Every day diabetic patients need to make a series of choices with regards to eating that are very important in regulating their blood glucose levels and overall health. Surprisingly, literature reveals that, many are unaware of the role of diet in ensuring glycemic control. [11] According to Sigal et al., [12] the corner stone of diabetic management is the balance between diet, exercise and timely medication. Based on this background, nutritional knowledge is regarded as indispensable in diabetic self-care, management and treatment. Unfortunately, in Kenya there is scanty information in regard to nutritional knowledge and nutritional status among diabetic patients. This study therefore aimed at assessing the nutritional knowledge level and nutritional status of diabetes type II patients attending Kikuyu Mission Hospital, Nairobi, Kenya.

MATERIALS AND METHODS

This was a cross-sectional analytical study undertaken at Kikuyu Mission Hospital Nairobi, Kenya.

Study Population

The study involved 153 respondents with type 2 diabetes. Only adults with type 2 diabetes attending the diabetic clinic at Kikuyu Mission Hospital were included in the study. Pregnant and lactating women were excluded from the study. All those who declined to participate were also excluded from the study.

Data Collection Tools

A semi-structured questionnaire was used to collect information on socio-demographic, economic characteristics and nutritional status of the respondents. Information collected included; age, gender, education, occupation marital status, religion, monthly income, weight and height. Salter scale and stadiometer were used to take weight and the height of the respondents respectively. Moreover, after content validity was developed, nutrition knowledge test marking guide questionnaire was used to assess the respondents' nutritional knowledge.

Data Analysis

Data analysis was carried out using the statistical package for social sciences (SPSS version 17). Statistical measures such as percentages, means, ranges and standard deviations were used to describe the study population. Additionally, inferential statistical measures such as Chi-square, ANOVA, and regression logistics were used to test for association among the study variables. In regard to nutritional knowledge, a nutritional knowledge test marking guide was used to assess nutritional knowledge. The respondents were graded according to their responses. The nutritional knowledge was rated on percentiles and the respondents graded using three cut off points (Courtney, 1999). [13]
Low nutritional knowledge: "<40" (lower percentile)
Average nutritional knowledge: "40-69" (median)
High nutritional knowledge: ">70" (upper percentile)
Nutritional status among the adult type 2 diabetic patients was classified based

on the following classes as provided by WHO. [14]

<18.5-underweight 30.0-34.9-class I obesity
18.6-24.9-normal 35.0-39.9-class II obesity
25.0-29.9-overweight ≥40-class III obesity

Ethical Approval

Before the study began, ethical clearance was obtained from Kenyatta National Hospital Ethics Committee. Permission to conduct the study was also sought from Kikuyu Hospital management. All principles guiding ethics in research, including scientific merit, equitable selection of subjects, seeking informed consent, confidentiality and avoidance of coercion were adhered to. Informed signed consent was obtained from each respondent before the interviews were conducted.

RESULTS

Socio-economic and demographic characteristics of the participants are presented in Table 1. Most of the respondents (72.5%) were between the ages of 51-70 years. Majorities were females (75.8%) and were married (67.4%). Furthermore, only about 37.9% of the participants had formal education up to secondary level. A significant proportion of the respondents were self-employed and reported to be earning a monthly income of more than Ksh 10, 000.

Nutritional Knowledge

The mean nutrition knowledge score was 32 ± 13 and the median was 30. The minimum score was 15 percent while the maximum score was 68 percent.

Distribution of Respondents by Nutritional Knowledge

From the study finding, majority of the respondents (69.3%) had low nutritional knowledge (<40).About 30.7% had average nutritional knowledge (40-69) (Table 2).

Table 1: Socio-Economic and Demographic characteristics of the study population

Demographic characteristics	N(153)	%
Age group(Years)		
31-40	6	3.9
41-50	13	8.5
51-60	53	34.6
61-70	58	37.9
71-80	7	4.6
81-90	16	10.5
Sex		
Male	37	24.2
Female	116	75.8
Marital Status		
Single	25	16.3
Married	103	67.4
Widowed	16	10.5
Divorced	9	5.9
Education		
No Formal Education	18	11.8
Primary	50	32.7
Secondary	58	37.9
Post-Secondary	27	17.6
Occupation		
None	14	9.2
Self Employed	73	47.7
Formal Employment	34	22.2
Farmer	32	20.9
Monthly Income		
0- 10,000	61	40
10,001- 20,000	43	28
20,001-30,000	10	6.5
30,001-40,000	15	10
41,001-50,000	11	7
>50,001	13	8.5

Table 2: Distribution of respondents by nutritional knowledge scores

Nutrition Knowledge	(N=153)	Percentage
10-19	46	30.1
20-29	35	22.8
30-39	25	16.3
40-50	29	19.0
50-69	18	11.8

Table 3: Number of respondents able to answer various questions

NUTRITION KNOWLEDGE	Male (N=37) %	Female (N=116) %
1. Knowledge on sources of;		
Foods that help to control blood sugar	26.2	27.1
Foods rich in vitamin C	17.8	18.3
Foods rich in vitamin A	15.6	14.3
Low glycemic index foods	4.7	5.2
2. Factors considered when choosing food		
Dietary needs of diabetes	4.5	5.5
Food availability	70	70.4
Food affordability	11.2	4.8
Food in season	14.3	11.3
3. Meaning of balanced diet		
Diet containing carbohydrates, proteins, fats vitamins and minerals	8.5	7.9
Diet containing carbohydrates, proteins and vitamins	16.2	15.7
Adequate amount of food	33.3	30.8
Do not know	41.2	40.2

Table 3 shows some of the questions that were used to gauge the nutritional knowledge of the respondents and the percentage number of people who were able to answer various questions. Most respondents did not know the meaning of a balanced diet (81.4%).

Respondents Nutritional Status

The results showed that majority (50.9%) of the respondents were obese, with most of them being in class III obesity (29.4%). Only 19.6% had a normal nutritional status. Worthwhile noting, over 80% of the respondents had unsatisfactory BMI either too high or too low (Figure 1).
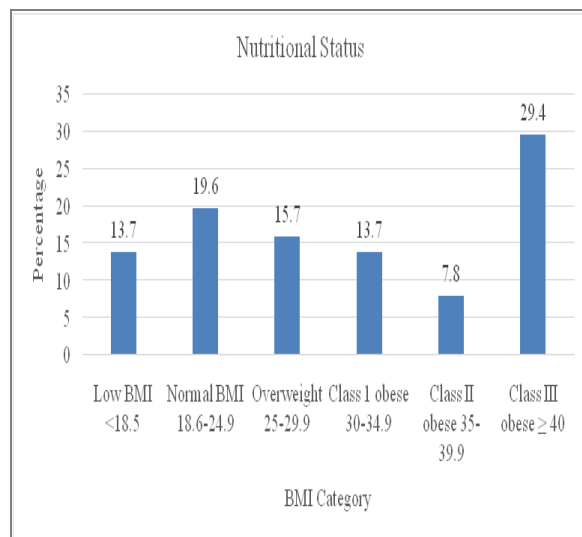

Figure 1: Distribution of respondents by nutritional status

Relationship between Study Variables

Association between the dependent and the independent variables was established;

Education Level and Nutrition Knowledge

Education level was significantly associated with nutritional knowledge (χ^2=2.73, P=0.023). Analysis of Variance (ANOVA) revealed that those respondents with higher level of education (post-secondary) had higher nutrition knowledge than the ones with lower education and those with no formal education. The difference in the means of the various education levels was also observed to be significantly different (P=0.026).

Table 4: Relationship between education level and nutrition knowledge

Education level	Nutritional knowledge		Statistical test
	Low (<40%)	Medium (40-69%)	
Post-secondary	21	79	
Secondary	35	65	χ^2, P=0.023
Primary	58	42	
No formal education	77	23	

In this study, there was no any significant relationship between nutritional knowledge and the other selected demographic and socio-economic characteristics of the respondent (P>0.05).

Association between participants' nutritional knowledge and nutritional status

The results showed significant association between nutritional knowledge the nutritional status of the respondents. Analysis of Variance showed that those with a normal nutritional status had the highest nutritional knowledge score. Significant differences were also noted between the mean score of the different nutritional status groups (ANOVA=0.032).

Table 5: Relationship between respondents' nutritional knowledge and nutrition status

	Low (<40)	Medium (40-69)	Statistical test
Low BMI	51.2	48.8	
Normal BMI	18.5	81.5	
Overweight	62.8	37.2	χ^2, P=0.044
Obese	75.4	24.6	

DISCUSSION

In the present study, it is observed that the prevalence of diabetes increased with advancing age. Similar finding are also documented by other authors. [15-18] it's widely documented that diabetes type 2 mostly occurs in mid-year of life. According to WHO, [19] majority of diabetes type 2 cases are above 45 years of age. This may be attributed to glucose intolerance associated with increase in age. As the age increases cells sensitivity to insulin also reduces. This insensitivity could be due to physical inactivity associated with advancing age. Additionally, highest frequency of diabetic respondents was observed in females (75.8%) as compared to males (24.2%). The increased prevalence of

diabetes among female could be possible since most women lead a sedentary life, are more obese and engage in less strenuous activities as compared to the men. Similar findings have also been reported in other studies. [20-22]

Majority of the respondents had a low nutritional knowledge. This could be attributed to the fact that most patients attended nutrition education sessions occasionally. This could result to poor management of the condition since most might not make appropriate food choices that will control their blood glucose. Uncontrolled diabetes is said to exacerbate the risk for cardiovascular diseases, hypertension, neuropathy, retinopathy among other conditions. [23]

In regard to nutritional status, majority were obese. This could explain the occurrence of diabetes since overweight and obesity have been linked to diabetes. Obesity is one of the predisposing factors to diabetes type 2. It results from poor feeding habits and lack of physical activity. Notably, one in three of the world's adults are overweight and one in ten is obese. [24] Overweight and obesity is associated with increased resistance of the cells to the insulin activity. According to WHO, [25] the upsurge in cases of diabetes and hypertension is being propelled by the growing prevalence of overweight and obesity.

There was a strong association between education level and nutrition knowledge of the respondents. This could be attributed to the fact that when one is educated, they are exposed to diversified sources of dietary information which would impact positively on their nutritional knowledge

Further, there was significant association between nutritional knowledge and the nutritional status of the respondents. Those with a normal nutritional status had the highest knowledge. This may be explained by the fact that those with more nutritional knowledge are able to choose healthy foods and maintain optimal weight.

This observation shows the role enhancing nutritional knowledge among the population could play in ensuring satisfactory nutritional status.

CONCLUSION

High level of education positively influences the nutritional knowledge and nutritional status of diabetic patients. The higher the level of education the better the nutritional knowledge and ultimately the nutritional status. Obesity is also noted to be very common among diabetes patients. This is very detrimental and counter-productive particularly for people suffering from type 2 diabetes as this makes the control of their blood sugar more elusive. The low level of nutritional knowledge reported in this study poses need for urgent interventions. The government through the Ministry of Health and all other relevant stakeholders should scale up intervention programs geared toward enhancing the nutritional knowledge of the population and particularly among diabetic patients. General public awareness on the importance and strategies of attaining and maintaining optimal weight should also be enhanced.

REFERENCES
1. World Health Organization (2011) Global Status Report on Non-Communicable Diseases 2010. WHO, Geneva.
2. Dandona L, Dandona R, Naduvilath T J, McCarty C A, Rao GN. Population based assessment of diabetic retinopathy in an urban population in southern India. J Ophthalmol. 1999; 83:937-40.
3. World Health Organization. Geneva: WHO. Prevention of Blindness from Diabetes Mellitus. Report of a WHO Consultation in Geneva, Switzerland9-11 Nov 2005. p. 1-3.
4. Rajendra P. Epidemiology of diabetes in India: Current Prospective and Future Projection. Journal of Indian Medical Association 2002; 100(3):237-248.
5. International Diabetes Federation. IDF Diabetes Atlas, 7th ed. Brussels, Belgium: International Diabetes Federation, 2015.
6. WDF. The First African Diabetes Summit Report. World Diabetes Foundation, Copenhagen, Denmark. 2007; 25-32.

7. Hu FB. Sedentary lifestyle and risk of obesity and type 2 diabetes. Lipids. 2003; 38(2):103-8.
8. Helmrich SP, Ragland DR, Leung RW, Paffenbarger RS Jr. Physical activity and reduced occurrence of non-insulin dependent diabetes mellitus. N Engl J Med. 1991; 325(3):147-52.
9. Kenya Diabetes Management and Information Centre. (2011). http//www.dmi.org/index.php?=com_content&task=view&id=51&Itemid=65 viewed on June12 2012.
10. Khullar S, Singh M, Singh P. The predictors of type 2 diabetes mellitus in Punjab, India. Int J Health Sci Res. 2015; 5(11):321-328.
11. Worku A, Abebe SM, Wassie MM. Dietary practice and associated factors among type 2 diabetic patients: a cross sectional hospital based study, Addis Ababa, Ethiopia. Springer Plus.2015, 4(15).
12. Sigal RJ, Kenny GP, Wasserman DH, Wasserman DH.et al. Physical activity/ exercise and type 2 diabetes. Diabetes Care. 2006; 29(6):1433-1438.
13. Courtney, T. Hand book of Statistics. Usefulness of percentiles in statistics. Macmillan Publishers. New Jersey. 1999; 10-12.
14. WHO. Assessment of Nutrition Status. II Diabetes. Report of a World Health Organization and International Diabetes Federation meeting. WHO/NMH/MNC/03.1 WHO Department of Non-communicable Disease Management, Geneva.1991; 10-40.
15. Arora V, Malik JS, Khanna P, Goyal N, Kumar N, Singh M. Prevalence of Diabetes in urban Haryana. AMJ 2010; 3(8):488-494.
16. Nayak HK, Vyas S, Solanki A, Tiwari H. Prevalence of type 2 diabetes in urban population of Ahmedabad, Gujarat. Indian J Med Specialties 2011; 2(2):101-105.
17. Denmark (Anger E, Thorsteinson, Erikson M. Impaired glucose tolerance and diabetes mellitus in elderly subjects. Diabetes Care 5, 1989; 600-604.
18. Wild S, Roglic G, Green A, Sicree R, King H. Global Prevalence of Diabetes: Estimates for the year 2000 and projections for 2030. Diabetes Care. 2004; 27:1047-53.
19. WHO. Diabetes action now. An initiative of World Health Organization and international_ diabetic_ federation. 2003; Available at :http://www.who.int/diabetes /actionnow/booklet.
20. Motala AA, Pirie FJ, Gouws E, Amod A, Omar MA. High incidence of type 2 diabetes mellitus in south African Indian. 10 years follow up study. Diabetes Med 2003; 20:23-30.
21. Tandle BV. Prevalence and risk factors of diabetes mellitus in adults aged 25 years and above in urban health centre field practice area of Govt. Medical College, Aurangabad: Thesis submitted to Marathwada University, Aurangabad; 2000.
22. Ahmad J, Ahmad MM, Mohd A, Rashid R, Ahmad R, Ahmad A et al. Prevalence of diabetes mellitus and its associated risk factors in age group of 20 years and above in Kashmir, India. Al Ameen J Med Sci 2011; 4(1):38 -44.
23. Habib F, Durrani AM. Relation of healthy eating and exercise with glycemic control among type 2 diabetic patients. Int J Health Sci Res. 2016; 6(2):360-363.
24. World Health Organization. Screening for Type II Diabetes. Report of a World Health Organization and International Diabetes Federation meeting. WHO/NMH/MNC/03.1 WHO Department of Non-communicable Disease Management. Geneva. 2008; 5-68
25. WHO. The World Health Report: Reducing Risks, promoting healthy life. World Health organization, Geneva. 2002; 14-26.

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