Awareness and Risk Factors of Type 2 Diabetes Mellitus in Zanzibar.

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Abstract: Nutrition related non-communicable disease like diabetes, is the prominent source of mortality in the world. Most nutrition associated non-communicable diseases is end result of four specific behaviors (tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol) that lead to 4 vital metabolic/physiological changes (raised blood pressure, overweight/obesity, raised blood glucose and raised cholesterol). The cross sectional study was conducted at West district in Zanzibar. Data were collected using WHO steps tools translated into the local languages. Individuals for the study were selected by random selection for interviewing and physical examination from the study base. Data were analyzed using SPSS for Windows version 16.0.The 100 respondents of the survey 36% were men and 64% were women in Wete district Zanzibar. The 58% of people did not understand about the diabetes type2 knowledge of which 23% were male and 35% female, 26% of respondents 8% male and 18% female had little knowledge about the diabetes type 2 while only 16% of had the knowledge about the type 2 diabetes 5% male and 11% female. Also the distribution of the various categories of risk factors is identified. Body Mass Index (BMI) was calculated for each participant as (weight in kilogram)/ (height in meter) ².The nutrition status of the people showed 4% male and 2% female are underweight, 14% male and 33% female are normal, 15% male and 25% female are overweight and 3% male and 4% female are obese. The magnitude of risk factors for NRNCDs is considerably high in the study population.

Keywords— Type 2 diabetes, Nutrition status, knowledge, Risk factors of type 2 diabetes.

1. INTRODUCTION

Type 2 diabetes is an interminable metabolic condition portrayed by insulin obstruction (that is, the body's powerlessness to viably utilize insulin) and deficient pancreatic insulin creation, bringing about high blood glucose levels known as hyper glycaemia [1]. With type 2 diabetes, the body both resists the effects of insulin a hormone that adjusts the motion of sugar into your cells or would not produce ample insulin to hold a regular glucose level. Type 2 diabetes develops when the physique will emerge as resistant to insulin or when the pancreas stops producing sufficient insulin. Exactly why this occurs is unknown, even though genetics and environmental factors, such as excess weight and inactivity, appear to be contributing factors [2]. Diabetes is a major health problem worldwide thus becoming pandemic. Diabetes is a main health trouble global accordingly becoming pandemic. Due to its persistent nature and complications accompanying the disease progression, the value of managing diabetes is significant.. Globally, an estimated 422 million adults have been dwelling with diabetes in 2014, in contrast to 108 million in 1980. The world occurrence (age-standardized) of diabetes has nearly doubled because 1980, rising from 4.7% to 8.5% in the person population. This reflects an amplify in associated chance elements such as being overweight or obese. Over the past decade, diabetes occurrence has risen quicker in low- and middle-income nations than in high- income countries. Diabetes prompted 1.5 million deaths in 2012. Higher-than-

optimal blood glucose brought on an extra 2.2 million deaths, by using growing the dangers of cardiovascular and other diseases. Forty-three per cent of these 3.7 million deaths appear before the age of 70 years. The proportion of deaths attributable to excessive blood glucose or diabetes that takes place prior to age 70 is greater in low- and middle-income countries than in high-income countries [3]

According to the International Diabetes Federation, the occurrence of diabetes is close to 4% on the African continent in contrast to 10.2% in North America .The prevalence of diabetes in sub-Sahara Africa will expand by way of 90% through the year 2030 [4]. The population of sub-Saharan Africa is set to grow from around 860 million in 2010 to greater than 1.3 billion through 2030. For age groups above forty years, the will increase will double the size of the population. People aged 45-59 years are 8.5 times greater probable to develop diabetes than these aged 15-29 years; and those above the age of 60 are 12.5 times more possibly to boost diabetes. Based on the current occurrence costs in sub-Saharan Africa, the demographic modifications on my own will account for an extend of 9.5 million human beings with diabetes between 2010 and 2030 (DLF, 2010). In 2013, the majority of individuals with diabetes in Africa were reported to be under 60 years of age with the highest proportion (43.2%) in people aged 40 to 59years [5].

1.2 Problem Statement

Tanzania has likewise encountered a critical ascent in the weight of diabetes and is evaluated that in excess of 400,000 individuals are living with diabetes. A significant worry in the management of diabetes is the event of diabetic occurrence which happen because of poor glycemic control.T2DM mostly affects people older than 40 years of age although, it has a very low prevalence in children and adolescents (i.e., about 0.3 percent). T2DM accounts for approximately 90% to 95% of all diagnosed cases of diabetes in adults [6]. There were more than 822,800 cases of diabetes in Tanzania in 2015 [6] projected diabetes dominance in Zanzibar stands at 7 % and 11%. It is assumed that more than half of the diabetes cases are undetected [6].

1.3 Objective of the Study

The aim of the present study was to assess the awareness type 2 diabetes in urban district Zanzibar for adult peoples, because most of the peoples have lack of knowledge about type 2 diabetes and there causes.

2 METHODOLOGY

This study was a cross-sectional in design where by the qualitative and quantitative data were collected at one point in time, data was collected by using structured Questionnaire. Participants were interviewed through closed and open ended questions based on assessed the knowledge about type 2 diabetes in relation to physical activities. The entire study population had an equal chance of being selected so that data was collected help to achieve research objectives. This design was appropriated for descriptive analysis that was used to determine the relationship between and among variables.

2.1 Study population

The study population involved a representative sample of adult people both men and women in urban district. The knowledge about type 2 diabetes mellitus was assessed. Inclusion criteria for participants were included, all adult who were willing to participate in a study and to answer the questions were asked.

2.2 Sample technique

The sampling techniques used, involved both purposive and random sampling, it is purposive because this study included all adult and each individual had an equal chance to be selected in a sample (probability sampling). Therefore the selected peoples were interviewed using a prepared structured questionnaire.

2.3 Sample size

The sample size calculated by the following formula Sample size was calculated according to the following formula:

$$n = Z2 \times p \times qd2$$

Whereby:

n = Desired minimum sample size

Z = The standard normal deviate corresponding to 95% Confidence Interval

p = Target population to have characteristic being interviewed

q = 1- p

d = Degree of accuracy or desired precision

Taking the prevalence of type 2 diabetic peoples in Zanzibar 7% or 0.07, Z statistic corresponding to 95% confidence interval for a two-tailed test as 1.96, and degree of accuracy at 0.05, the sample size was:

$$n = \frac{(1.96)2 \times 0.07 \times 0.93}{(0.05)2}$$

$$n = 100$$

The computed sample size of 100 was based on the prevalence of type 2 diabetes in Zanzibar. The sample size was 100 people used for this study due to the influencing resources and time to conduct the study.

2.4 Data collection

Semi structured questionnaire was used to enhance the study. The structured questionnaire is designed in such a way that comprised of different parts basing on the required information.
Questionnaire was filled by the researcher according to information from the respondents. The questionnaire was written in English because only researcher will fill it according to response of peoples. In study was assessed knowledge and attitude of type 2 diabetes, nutrition status of individuals and assessment of physical activities. Then the information was analyzed using Statistical Package for Social Sciences (SPSS).

2.5 Types and Sources of Data collection

Both secondary and primary data were employed in this study. Primary data was directly collected from the respondents through the asked the questions based on assessing knowledge risk factors about type 2 diabetes, while the secondary data was reviewed from the literature reviews.

2.6 Data analysis

After data collection the analysis of the obtained data followed. Collected data was recorded, compiled, coded, entered in computer program, edited and cleaned then was analyzed by using Statistical Package for Social Sciences (SPSS) computer program version 16.0. The software helped to do statistical analysis by calculating proportions, and cross tabulations and the statistical relationship between the

various risk factors associated to type 2 diabetes. The results was presented in statistical format like tables, and frequencies as well as percentages wherever applicable, this helped to convey data into meaningfully information hence making conclusion based on the results obtained from the study.

3 RESULT

Demographic characteristics

The 100 respondents of the survey 36% were men and 64% were women in north district Zanzibar. 12% non-educated, 19% completed primary education, 62% completed secondary education and 7% completed university education. Age was range for respondent's was18 to 80 years of age, 18 to 38 years of age was 47%, 39 to 59 years of age was 46% and 60 to 80 years of age was 7%.

Demographic characteristics of the respondents

Characteristics of respondents	Category	N	%
Age	18 – 38	47	47.0
	39 - 59	46	46.0
	60 -80	7	7.0
	Total	100	100
			36.0
	Male	36	64.0
Gender	Female	64	
	Total	100	100
	Non formal	12	12.0
	Primary school	19	19.0
Level of education	Secondary	62	62.0
	school	7	7.0
	College	25	
	Total		100

3.1 Knowledge of diabetes

The 58% of people do not comprehend about the diabetes knowledge 27% early adult, 26% middle adult and 5% late adult. 31% have low knowledge 14% early adult, 15% middle adult and 2% late adult. While only 11% of the respondents 6% early adult, 5% middle adult and 0% late adult were understand about the knowledge about diabetes. About the sex 58% of respondents 22% male and 36% female do not understand about the diabetes knowledge, 31%of respondents 12% male and 19% female have low knowledge of comprehending about the diabetes and while only 11% of the respondents understand about the knowledge about diabetes 2% male and 9% female.

Also about the education level 58% of respondents 7% non-formal education, 15% primary education, 36% secondary education and 1% high level education were not knowledge about diabetes.31% of respondents 3% non-formal education, 4% primary education, 23% secondary education and 1% high level education were have low knowledge about diabetes. While only 11% of respondents 2% non-formal education, 0% primary education, 4%

secondary education and 5% high level have knowledge about diabetes.

3.2 Percentage about causes of type 2 diabetes

About the knowledge of understanding the causes of type 2 diabetes showed 73% of people were not understand about the causes of type 2diabetes. While 11% said the causes of type 2 diabetes is excessive body weight 4% early adult, 6% middle adult and 1% late adult. 16% said the causes of type 2 diabetes is sedentary life style 9% early adult, 7% middle adult and 0% late adult.

For the sex of respondents 73% not understand the causes of diabetes 27% male and 46%，11% said the causes of type 2 diabetes is excessive body weight 3% male and 8% female and 16% said the causes of type 2 diabetes is sedentary life style. Also about the education level 73% not understand the causes of type 2 diabetes 9% non-formal education, 17% primary education, 46% secondary education and 1% high level education. While 11% said the causes of diabetes is excessive body weight 1% non-formal education, 0% primary education, 9% secondary education and 1% high level education and the other 16% said the causes of diabetes is sedentary life style 2% non-formal education, 2% primary education, 7% secondary education and 5% high level education.
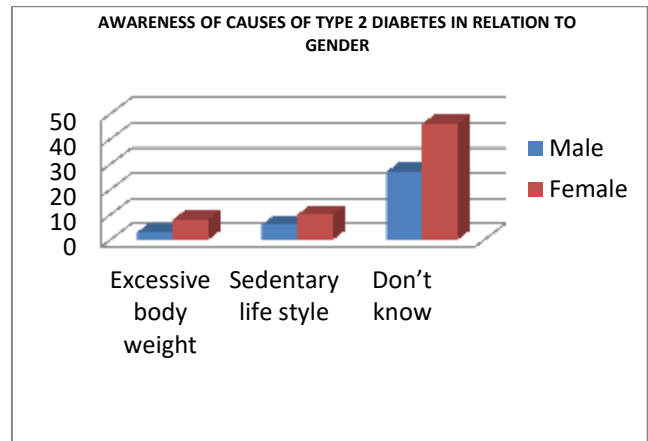

3.3 Risk factors of type 2 diabetes (Life style)

Overall prevalence of smoker and alcohol use were 27% (21% in men and 6% in women) according to gender difference and all twenty seven per cent were daily smoker. Some of them don't remember when they started smoking, other started smoking at age in adolescent age and other in old age.

About the diabetes status and use of alcohol the overall prevalence it show that the number of people use alcohol is less and the result about people have diabetes status and use of alcohol are 1%, 19% use alcohol but have not diabetes, 7% use alcohol but not tested, 10% have diabetes but not use alcohol, 47% have not diabetes and not use alcohol and 16% not use alcohol and not tested.

**Percentage about smoker the use of alcohol and diabetes status**
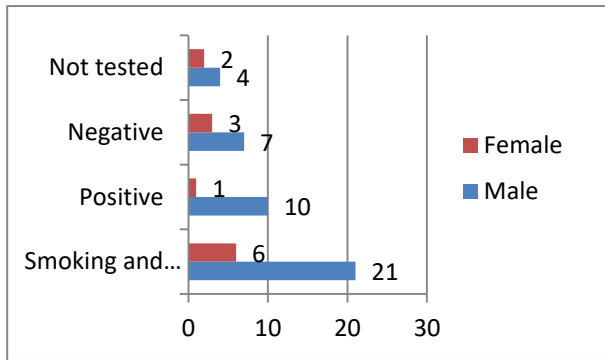
3.4 Nutrition status

The result of height and weight according to this study was showed that the mean of weight is 65.03 and height is 159.67 also the standard deviation of weight is 8.788 and height is 3.464.

Also the Body Mass Index (BMI) was calculated for each participant as (weight in kilogram)/ (height in meter)^2 and categorized as per risk level as underweight BMI <18.5, normal weight $18.5 \geq$ BMI <25, overweight $25 \leq$ BMI ≤ 30 increased risk and obese BMI > 30 substantially increased risk. The nutrition status of the people showed 4% male and 2% female are underweight, 14% male and 33% female are normal, 15% male and 25% female are overweight and 3% male and 4% female are obese.

Nutrition status
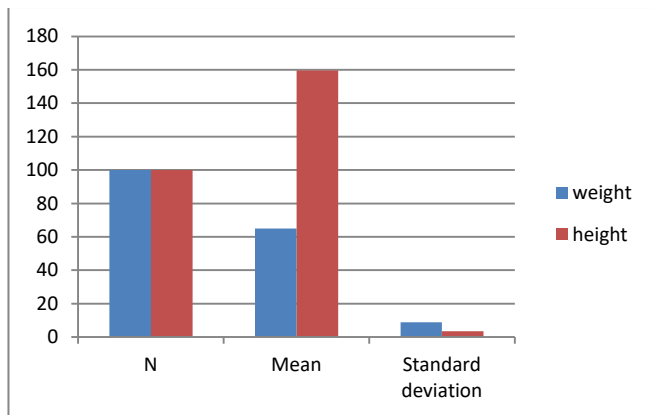
4.0 DISCUSSION

4.1 Social demographic factors

The research indicated that 100% for both men and women in north district Zanzibar. About education level were showed the non-educated, completed primary education, completed secondary education and completed university education. So according to this result the number of those who completed secondary education is higher compare the other level.

Age of respondent's showed the number of young adult is higher compared to middle and late adults. Also the study

discovers the large number of married people. Not only that but also the study were showed majority of people had middle income level and many are self-employed.

4.2 Nutrition status

According to this result was showed that the majority numbers of people are at risk to get type 2diabetes because of their lifestyle. 15% male and 25% female are overweight and 3% male and 4% female are obese. The main risk factor of type 2diabetes is obese. Both obesity and type 2 diabetes are strongly associated with an unhealthy diet and physical inactivity. Given that majority of Zanzibaris do not know how to determine whether their weights are normal, overweight or obese, it may difficult for them to develop concrete attitudes about their weight. The efforts that aim to encouraging Zanzibaris to control their weights are needed in order to create awareness on the appropriate knowledge about how to control the body weight.

According to the other study, physical and social environments are essential influences on diet and bodily undertaking behaviour alongside with interrelated economic, psychological and cultural factors [7]. Sedentary behaviour is also linked to obesity and a recent British study found that people with type 2 diabetes recorded greater amounts of inactive time compared with their non-diabetic counterparts [8].

There is a close affiliation between obesity and type 2 diabetes. The probability and severity of type 2 diabetes are intently linked with body mass index (BMI). There is a seven times more hazard of diabetes in obese people paralleled to those of healthy weight, with a threefold increase in hazard for overweight people [1].

4.3 Diabetes knowledge and attitudes

The study revealed that, many people did not have knowledge concerning diabetes. This noticed on some questions asked during data collection, also the few number of female have knowledge about diabetes compare to the male. Throughout knowledge assessment, is recognized that most people didn't know about diabetes diseases, insufficient awareness of about diabetes and the importance of lifestyle modification were very obvious among people and only few numbers of them had good knowledge of diabetes. Also majority of people were have not knowledge are people have low education level.

Another study in Kenya find out about that the degree of knowledge of diabetes in all regions is very poor 27.2% of all inhabitants had correct knowledge of diabetes and 41% proven right practices towards diabetes. In Mongolia, one in five Mongolians has in no way heard the term diabetes' prior to being interviewed and considerably more rural dwellers (26.6%) said no knowledge than urban counterparts (15.6%) [9].

Poor knowledge regarding diabetes has been reported in numerous studies from the developing countries, also the

study were showed Primary education level was significantly associated with low diabetes knowledge [10]

4.4 Type 2diabetes knowledge

The majority of people did not have knowledge about the diabetes type 2 despite of that the number of females who did not have knowledge was higher compared to males. This noticed on some question involved about the knowledge of type 2diabetes. Also due to lack of knowledge it leads the Zanzibaris to live in sedentary life style in term of physical body activities and dietary habit. Also lead unhealthy life which causes the higher risk for people to get type 2diabetes.

Although extraordinary strategies of evaluating the whole score of knowledge of T2D exist among numerous studies, their findings can supply proof on the status of diabetes information of populations. Rates of diabetes knowledge have been observed to be lower in developing countries than in developed countries [11].

In India, comparable research confirmed 20 to 25% of inhabitants are unaware of a condition known as diabetes. In Bangladesh, knowledge of diabetes and its danger factors is very limited in rural areas, even in persons diagnosed with T2D. With regard to the rural urban distinction in knowledge and attitude towards T2D, the existing study suggests that inhabitants in urban areas had notably better knowledge and attitude than those in rural areas. This difference has additionally been observed in Mongolia and in different regions of India [12].

About the attitude massive study with a representative pattern recruited from the regularly occurring populace aged 40 to 64 years in a normal province of the Red River Delta region, Vietnam. The study proven the detailed picture of the typical understanding of the rural and urban populations on T2D, which consists of vast awareness, risk factors, serious level, complications, prevention and remedy of the disease. On average, three in 4 (75%) inhabitants had exceedingly insufficient, 17.9% had insufficient, 6.8% had satisfactory, and 0.3% had fairly best levels of knowledge. Therefore, one ought to recognize that the lack of awareness might also lead to the reality that there have been nonetheless 73% of diabetic subjects who do now not know of the condition [13].

4.5 Causes of type 2 diabetes

According to the result it showed that the high number of people do not apprehend the causes of type 2 diabetes in term of sex, age categories and education tiers and few people have been be aware of the correct causes of diabetes. The different result showed, during knowledge assessment, we recognized that most people didn't recognize about cause of diabetes and its consequences so because of this it lead the excessive threat for people to get type 2diabetes because people are now not conscious about the causes of type 2diabetes.

The unhealthy life style is the main cause of diabetes for people, only a few of they knew that one of the frequent problems of diabetes is kidney disease (6%). Insufficient

cognizance of problems and the importance of life-style change were very apparent among patients and solely 2% of them had correct knowledge of diabetes. Poor expertise related to diabetes has been stated in several research from the developing nations [10]

4.5.1 Risk factors of type 2 diabetes (Smoking)

Data additionally confirmed that with smoked tobacco as well as smokeless tobacco of which the majority of modern-day users are using daily. With no decrease limit or threshold above which tobacco is anticipated to be harmful, daily use of tobacco shows a higher exposure and hence due to the anticipated linear relation between exposure and risk, a higher risk of developing tobacco associated conditions. Overall, Zanzibaris were not aware of the negative impact of risk behaviors including daily alcohol drinking and smoking.

Type 2 diabetes mellitus is closely related to life style factors, including alcohol and smoking, the number of epidemiological studies has examined the association between alcohol consumption and the development of diabetes mellitus. Among western epidemiological studies, some found no association.

Smoking is one of the modifiable hazard factors for many persistent diseases, such as cardiovascular disease (CVD), cancer, chronic obstructive lung disease, asthma, and diabetes. However, the detrimental consequences of smoking on diabetes have been generally below recognized. In the suggestions from the Korean Diabetes Association, smoking cessation is advocated as one of the most vital steps in preventing the cardiovascular complications of diabetes [14].

Another study stated a 14-year-long prospective cohort study, in which the threat of diabetes amongst men and women who smoked 20 cigarettes or extra per day used to be 1.55 (95% confidence interval [CI], 1.51 to 1.60) compared to those who in no way smoked additionally men for 4 years in rural and urban settings in Korea, and observed that past and current people who smoke had a extensively extended threat for type 2 diabetes, and the chance elevated with the range of cigarettes smoked [15].

4.5.2 Diabetes status and use of alcohol

The study showed there are number of people use alcohol but not tested diabetes, because of this it show the number of people have diabetes and use alcohol is low.The population predominantly confesses to Islam which prohibits the use of alcohol. As expected prevalence of alcohol consumption was low compared to surrounding levels, and the data has to be interpreted the number of respondents was low.

It is difficult to affirm the Zanzibar data in view that alcohol sold displays tourism, and there is a strong typical aversion and social stigma against alcohol consumers. Some threat factors are considered gendered, and as with alcohol consumption is higher for men. Interventions could target men and focus on healthy consuming (limit for intake over time, as well as per drinking episode and has to be weighed

towards the socio-cultural stigma towards alcohol consumption.

A recent meta-analysis found that the risk of developing type 2 diabetes is 30-40% higher for regular smokers than for non-smokers and that there is a positive dose-response relationship between the number of cigarettes smoked and the risk of developing diabetes [16].

REFERENCES

[1] A. Abdullah, A. Peeters, M. de Courten, and J. Stoelwinder, "The magnitude of association between overweight and obesity and the risk of diabetes: a meta-analysis of prospective cohort studies," Diabetes research and clinical practice, vol. 89, pp. 309-319, 2010.

[2] J. Ludwig, T. R. Viggiano, D. B. Mcgill, and B. Oh, "Nonalcoholic steatohepatitis: Mayo Clinic experiences with a hitherto unnamed disease," in Mayo Clinic Proceedings, 1980, pp. 434-438.

[3] W. H. Organization, "Global status report on noncommunicable diseases 2014," World Health Organization2014.

[4] D. R. Whiting, L. Guariguata, C. Weil, and J. Shaw, "IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030," Diabetes research and clinical practice, vol. 94, pp. 311-321, 2011.

[5] L. Guariguata, D. R. Whiting, I. Hambleton, J. Beagley, U. Linnenkamp, and J. E. Shaw, "Global estimates of diabetes prevalence for 2013 and projections for 2035," Diabetes research and clinical practice, vol. 103, pp. 137-149, 2014.

[6] E. Agardh, P. Allebeck, J. Hallqvist, T. Moradi, and A. Sidorchuk, "Type 2 diabetes incidence and socio-economic position: a systematic review and meta-analysis," International journal of epidemiology, vol. 40, pp. 804-818, 2011.

[7] B. Alberts, D. Bray, K. Hopkin, A. D. Johnson, J. Lewis, M. Raff, et al., Essential cell biology: Garland Science, 2013.

[8] M. Hamer, S. Bostock, R. Hackett, and A. Steptoe, "Objectively assessed sedentary time and type 2 diabetes mellitus: a case–control study," Diabetologia, vol. 56, pp. 2761-2762, 2013.

[9] A. R. Demaio, D. Otgontuya, M. De Courten, I. C. Bygbjerg, P. Enkhtuya, J. Oyunbileg, et al., "Exploring knowledge, attitudes and practices related to diabetes in Mongolia: a national population-based survey," BMC Public Health, vol. 13, p. 236, 2013.

[10] N. Gul, "Knowledge, attitudes and practices of type 2 diabetic patients," Journal of Ayub Medical College Abbottabad, vol. 22, pp. 128-131, 2010.

[11] W. K. Maina, Z. M. Ndegwa, E. W. Njenga, and E. W. Muchemi, "Knowledge, attitude and practices related to diabetes among community members in four provinces in Kenya: a cross-sectional study," Pan African Medical Journal, vol. 7, 2010.

[12] M. Deepa, A. Bhansali, R. Anjana, R. Pradeepa, S. Joshi, P. Joshi, et al., "Knowledge and awareness of diabetes in urban and rural India: the Indian Council of Medical Research India diabetes study (phase I): Indian Council of Medical Research India diabetes 4," Indian journal of endocrinology and metabolism, vol. 18, p. 379, 2014.

[13] T. Q. Binh, P. T. Phuong, B. T. Nhung, D. D. Thoang, P. Van Thang, T. K. Long, et al., "Prevalence and correlates of hyperglycemia in a rural population, Vietnam: implications from a cross–sectional study," BMC public health, vol. 12, p. 939, 2012.

[14] S.-H. Ko, S.-R. Kim, D.-J. Kim, S.-J. Oh, H.-J. Lee, K.-H. Shim, et al., "2011 Clinical practice guidelines for type 2 diabetes in Korea," Diabetes & Metabolism Journal, vol. 35, pp. 431-436, 2011.

[15] S. H. Jee, A. W. Foong, N. W. Hur, and J. M. Samet, "Smoking and risk for diabetes incidence and mortality in Korean men and women," Diabetes care, vol. 33, pp. 2567-2572, 2010.

[16] A. Jamal, D. M. Homa, E. O'Connor, S. D. Babb, R. S. Caraballo, T. Singh, et al., "Current cigarette smoking among adults—United States, 2005–2014," Morbidity and mortality weekly report, vol. 64, pp. 1233-1240, 2015.