DIABETES IN MALAYSIA: A SITUATIONAL STUDY ON PREVALENCE FACTORS OF THE DISEASE BASED ON SOCIO-ANTHROPOLOGICAL EXPLORATIONS

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ABSTRACT

Background and Objectives: *Diabetes has now become an acute health hazard causing illness to many people around the world and as such, Malaysia is not an exception. Although genetics and certain epidemiological factors often contribute much to the development of this disease, there is no denying the fact that certain socio-cultural factors like food habits and lifestyles often accentuate the cause and growth of this disease contributing to further of its deterioration. Diabetes prevalence rate has been found to be increasing at a very alarming rate in Malaysia, almost doubling the number since two decades bringing it 15.2% in 2011.This paper thus provides some empirical data based on a field study conducted among patients living in and around Kuala Lumpur in Malaysia.*

Methodology and Data Sources: *Based on convenience sampling, the research adopted the snowball technique in identifying a total of 70 diabetic patients at the National Institute of Diabetes and its catchment areas where they were interviewed extensively to generate some basic socio-economic and numerical data. The research also utilized a triangulation of qualitative techniques including in-depth interviews, personal and group discussions and a few focus group discussions (FGDs)through patients' participation.*

Major Findings: *The paper describes the socio-cultural situations of diabetes in Malaysia and contextually depicts the real situation of the disease in the country. Through identifying the significant socio-economic variables, the research relates the life and living styles of the patients from multi-ethnic and multi-cultural backgrounds. In relation to the questions that cover the major causes of diabetes, an overwhelming majority of the respondents however, sweepingly assessed and identified both genetic component and indiscriminate food habits as important susceptible factors for diabetes. It could not however, fully affirm the genetic cause as the most significantly overwhelming factor for Malaysia, as many of the patients' parents and grandparents in the past did not have diabetes in their early and middle periods of their life which leads us to believe that diabetes in Malaysia at large is a recent emergence.*

Conclusions and Final Comments: *In the concluding comments, the paper identified multi-causative factors for diabetes in Malaysia and thus suggests that Malaysian Government and policy planners should take note of all these issues for future protection.*

Keywords: Diabetes, situational study, socio-cultural dimensions, empirical viewpoints and recommendations

INTRODUCTION

Diabetes has presently been identified as the most vexing health problem for many societies around the world including those in Malaysia. "Diabetes mellitus is a metabolic disorder in

Leena and Luna International, Chikusei-shi, Japan.
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ISSN: 2186-8492, ISSN: 2186-8484 Print
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which the bodies' capacity to utilise glucose, fat and protein is disturbed due to insulin deficiency or insulin resistance" (Dunning 2014:2). Despite having considerable biomedical improvements in the global context in the past few decades, the etiology of diabetes however, has still remained at a glimmering situation. Although in the past it was believed that diabetes was most prominently pronounced in urban areas, as time passes by, it has now become a widespread phenomenon throughout the world affecting millions of people from all backgrounds. As part of its prevalence everywhere, Ritenbaugh and Goodby (1989) found that non-insulin dependent diabetes mellitus (NIDDM or Type II diabetes)[2] has been emerging as a health concern among American Indians since the early 1960s but historical evidence suggests that prior to 1940s, diabetes prevalence rate among American Indians was very low. A recent study by Thompson and Gifford(2000) has identified NIDDM among Australian aborigines as a consequence of living without having a balanced control. Whatever may be the reasons for and rate of prevalence, diabetes has also existed among the Cheroke and Apachee communities in Oaklahoma, U.S.A. (see Wiedman, 1989).

Recent statistics provided by World Health Organization (WHO) indicate that there are 347 million people worldwide suffering from diabetes every year and among them, the death caused by it stood at 3.4 million in the year 2004 (WHO, 2013). Among the top ten leading countries in the world affected by diabetes, at least six are in Asia. It is further evidence that at least 80% of the people in Africa with diabetes still remain undiagnosed; among these sufferers, many are predicted to die in their 30s to 60s (see Wild et al., 2004). World Health Organization also projects that diabetes will be the seventh leading cause of death in the world by 2030, and it is suspected that Southeast Asia may also be the region with the most victims (WHO, 2013).

With these indicatives, diabetes prevalence rate has been found to be increasing at a very fast rate in Malaysia, almost doubling the number since 2006 by bringing it from 8.6% to 15.2% in 2011(see Daily Star, June2013; Ministry of Health, Malaysia, 2007). With such statistics in mind, this paper provides some empirical data based on a field study conducted on patients living in and around Kuala Lumpur. More specifically, the paper relates the life of the patients from a multi-ethnic cultural context. In identifying the major causes of diabetes, the paper poses the rapid transformation of the society through over-modernization and identifies other cultural factors which typically are responsible for the increase in the prevalence of diabetes in Malaysia.

FIELD SITE, METHODOLOGY AND DATA SOURCES

The field site of this research is based in Kuala Lumpur, capital city of Malaysia from where we have identified 70 patients for detailed and extensive interviews with a set of structured questionnaire. These patients were mostly identified from the surrounding catchment areas of a research center named National Institute of Diabetes located in Kuala Lumpur. Based on convenience random sampling, the research adopted the snowball technique in identifying the patients for extensive structured interviews. Apart from these structured interviews with the 70 patients, the research additionally adopted in-depth interviews with two patients selected most suitably to serve our purposes. The research also conducted one FGD among respondents from three major ethnic groups Malaysia.

A BRIEF SOCIO-ECONOMIC PROFILE OF THE DIABETIC PATIENTS AND TRACING THEIR GENETIC RELATIONSHIP

Age: Age has become a significant contributor to diabetes as it is assumed that diabetes usually increases with the gaining of age. It also has been proven that there occurs a decrease

in glucose tolerance with the advancement of age (DeFronzo, 1981). The World Health Organization reported that this trend is quite visible among diabetic patients when it was found that approximately 16% of the patients in the United States are 65 years old and above (see WHO, 1980:16). This trend is quite visible in our research in Malaysia when we find that older persons aged 51 and above are among 64.29% (n=45) of the total number of patients. Among the total 70 patients interviewed, 17(24.29%) are from the middle-age group or ranging from 36 to 50-years old. Similarly, we find that as many as 8(11.42%) patients are still young; they were 35-years old or less. There might be many factors related to these for which many researchers in the medical science also suggest that physical changes with the advancement of age may not be the only factor for increased hyperglycemia (see Reaven & Reaven, 1980; Zavaroni et.al., 1986).

Education, Awareness and Treatment Alternatives

It has been well-recognized that the most important therapeutic modality for diabetic treatment is education. A patient who is educated certainly possess a better understanding about the disease and may also simultaneously respond very quickly to its therapeutic programme. Education allows learning and understanding about diabetes and educated persons will have better capabilities in coping strategies and developing problem-solving skill for the disease. All the patients interviewed in this research are found to be educated. Yet, it is quite certain that formal education can be substituted by providing behavioral knowledge about the disease and we understand that the Diabetic Centers in Malaysia have certain role in this regard.

Ethnicity and Religion

Diabetes is now prevalent in all groups of people irrespective of race, ethnicity and culture (see Wiedeman, 1989; Thompson & Gifford, 2000). Although we procured data on three ethnic groups in Malaysia, among them, the quantification in prevalence of diabetes among the Malay Muslims the preponderant majority constituting a total of 48 (68.5%) patients. Indians constitute 18(25.72%) and the number of Chinese in this context remains at only 4(5.71%). It has also been learned from hospital sources that compared to the Chinese, Malays are most prominently visible as patients (National Institute of Diabetes, Malaysia, 2013).

Occupation

There are many examples of diseases associated with specific occupations where industrial organic substances are often responsible for causing lung and respiration problems. Although diabetes could not be directly related to such industrial extracts, a few occupations which require one to remain seated on a chair for the whole day for the most part of it, may often cause diabetes. Looking more closely at the work-involvement of diabetic patients in Malaysia, it becomes clear to us that they belong to diversified occupational groups. A large number of them i.e., 22 (31.43%) are government and non-government servants and another sizeable number i.e., 21(30%) comes from the retirees.

Although it is not very significant, surprisingly, we found 3(4.2%) students from colleges and universities who have been suffering from this disease at a very young stage. It is undoubtedly very alarming because they are infected by diabetes at an early age because these students mostly stay at home spending more time sitting at their computer sand concentrating on it for hours. Doctors found that such young students eating too much unhealthy food and living a sedentary life with a habit of eating too much fast food and carbonated drinks. Type 2 diabetes is more apparent among this group of people aged between 18 and 29 years old (WHO, 2014).

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ISSN: 2186-8492, ISSN: 2186-8484 Print
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Genetic Component of Diabetes

NIDDM or Type 2 diabetes (T2D) is a more common type of diabetes affecting many people in large proportion which often relates to genetic determination of the disease. Based on that assumption, Neel (1962) developed his 'thrifty genotype' symptomatic hypothesis posing a viewpoint that 'thrifty genes' provide protection against starvation in those regions where people have to depend on seasonal fluctuations of food supply which allows its carriers to accumulate more fat than the non-carriers of NIDDM (see Neel, 1962). This has been proven by a comparative study that shows the difference in NIDDM prevalence among migratory Indians who settled in the United States compared to the native Indians staying in India (Mascie-Taylor, 1993)[2]. A more or less similar view has been noted by Pereira (2014) who contemplates that the nature of the epidemiologic transition of a population from scarcity to abundance in globalization and westernization results in the increase of T2D.

However, genetic component of diabetes has been identified as an important susceptible factor of Type II diabetes and many clinical studies have affirmed this relationship with high incidence of the disease in many cultural groups (see Stern, 1987; Gardner, 1984; Chakrabarty, 1986).But genetic linkage of diabetes does not seem to work fully in the Malaysian context, as a large number of our respondents i.e., 51 or 72.86% of fathers and 39 or 55.71%of mothers in this research did not have diabetes at an early age. In tracing this genetic linkage, it is further noticed that more than 90% of their grandparents also did not have diabetes in previousgeneration.[2] Based on ethno-historic evidence, it can be presumed that prior to the 1950s, Malaysians were predominantly rural based, having lived in villages (*kampong*), leading a very traditional way of life and avoiding impacts of modernization but nowadays, due to over-modernization and techno-industrial impact, there has been a disproportionate consumption of non-traditional food in restaurants containing over-saturated fat, monosodium-glutamate (MSD) as well as high sugar-intake which increases the diabetic situation in the country.

Table 1(Part-I). A Socio –Economic Profile and Genetic Background of Diabetes Patients

(I) Patient's Age (N=70)	(%)
Up to 35 years of age (young)	8 (11.42%)
36 to 50 years (middle-aged)	17 (24.29%)
51+ (old-aged per stage)	45 (64.29%)
(II) Ethnicity and Religious Affiliation of the Patients (N=70)	(%)
Malay (Muslims)	48 (68.51%)
Chinese (Buddhists)	4 (5.71%)
Indians (Hindus and Christians)	18(25.72%)
Patients' Level of Education (N=70)	(%)
Read Up to Class six	20 (28.57%)
Passed STPM or Higher School Certificate Exam	25 (35.71%)
Graduate or Diploma	16 (22.86%)
Post Graduate Degree	9 (12.86%)

Table 1(Part-II). A Socio –Economic Profile and Genetic Background of Diabetes Patients

(III) Occupational Background of the Patients Based on Their Principal Work (N=70)	(%)
Housewife	10 (14.29%)
Government and non-government servants	22 (31.43%)
Retired service personnel	21 (30%)
Businessman	10 (14.29%)
Unemployed and not working	4 (5.71%)
Students	3 (4.28%)

Table 2. Family Genetics and Diabetes

Father		*Mother*		*Grandfather*		*Grandmother*		*Other Members of the family**	
Yes	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
19 (27.14%)	51 (72.86%)	31 (44.29%)	39 (55.71%)	5 (7.14%)	65 (92.86%)	3 (4.29%)	67 (95.71%)	25 (35.71%)	45 (64.29)

*****Other members here implies one or more own brother(s) or sister(s)having diabetes

Table 3. Self-Assessment of Patients Having Diabetes

Reasons Identified by the Patients (Based on patients' own assessment)	*Number of Mentions Received %*
Genetic cause	47(52.86%)[1]
Due to food and indiscriminate eating habit	57(38.57%)[2]
Less exercise	31(44.29%)[3]
Being obese and fatty body	21(44.29%)[4]
Fate	8(11.43%)[5]

[1] Among the 70 patients, one respondent mentioned that he was very active when he was playing hockey. But as soon as he gave up this sport, he got diabetes.

[2] Three of the respondents mentioned that they have been suffering from pancreatic dysfunction which caused diabetes.

[3] One person admitted that he consumes too much beverages and also smokes and drinks most frequently.

[4] One person mentioned that he does very little exercise due to having a heart disease.

[5]Being fatalistic, a few patients mentioned that they do not perform any exercise nor do they control their food intake.

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Table 4. Present Food Habits of Diabetic Patients

(a)	*(b)*	*(c)*	*(d)*	*(e)*	*(f)*	*(g)*
Do you eat much sweet every day?	Do you eat meat and fish every day?	Do you eat vegetables every day?	Do you eat fast food most frequently?	Do you eat fruits every day?	Do you eat fast food most frequently?	Do you take soft drink most frequently?
Yes = 16 (22.86%)	Yes = 50 (71.43%)	Yes = 60 (85.71%)	Yes = 13 (18.57%)	Yes = 55 (78.51%)	Yes = 12 (17.14%)	Yes = 10 (14.39%)
No = 54 (77.14%)	No =20 (28.51%)	No = 10 (14.29%)	No = 57 (81.43%)	No = 15 (21.43%)	No =58 (82.86%)	No = 60 (85.71%)

* Three of the respondents mentioned that they take sugar but the consumption of it is measured closely

** Two patients admitted that they eat ice cream but it is very frequent; they take it on average once a month

*** Two patients said that they eat fruits everyday but is very limited; one patient even said that he eats half an apple and half a banana every day.

Patients' Awareness, Perceived Feelings and Self-Assessment about Diabetes

In medical science, clinical manifestations for diabetics receive the most pronounced attention; in recent times patients' feelings and their own assessment of the disease also receive considerable attention. Accordingly, awareness about diabetes is evaluated by the patients' own perceived knowledge about the disease. Clearly, it is manifested that out of 70 patients, 41 (58.57%) have some ideas about the disease but as many as 29 (41.43 %) of the patients do not have any idea about it. We found that a few patients (i.e. 4 or 5.7%) do not even take any treatment whereas 51(72.86%) of the patients admitted to having regular treatment at the hospital. The remaining 11 (15.71%) patients however, use their self-controlling mechanism to prevent diabetes. In order to understand the length of time that these patients have been suffering from diabetes, they were classified in three major time periods. It was found that 23 (32.86%) of the patients have been suffering from the disease in the last five years, 18 (25.71%)have suffered from it between 5 to 14 years and the remaining 29 (41.43%)of the patients have been living with the disease for more than 15 years.

FGD Narratives Related to the Patients

We interviewed six Malaysian respondents, taking two from each ethnic group (Malay, Chinese and Indians) in a FGD, bringing them together to provide their own observation regarding diabetes. These patients from multi-ethnic communities were recruited from the Institute of Diabetes which is a renowned treatment center for diabetic patients in Malaysia. Since the Chinese and Indian representation in the original sample was comparatively low, the equal ethnic representation of them in the FGD makes it methodologically appropriate and pragmatically meaningful.

Most of the respondents in the research spontaneously expressed their views regarding diabetes and most often blamed the socio-cultural situations which prevail in society. Almost all of the FGD participants of realize that diabetes was not so severe in the past as people at that time used to have a very solitary and peaceful life in easy-going environment. That

situation has now been replaced by a context where people are very busy and stressful, moving faster with technology.

In making an assessment about diabetes in present time, five respondents mentioned that it is principally food intake which could be identified as an important factor for this disease. In relation to this, one respondent named Hamzah categorically mentioned that although diabetes is a new type of illness, it is the food and food chain which to be blamed solely for this disease. While the patients went on to blame food habits, at least three of the respondents said that it has now become a new cultural practice where most Malaysians eat food outside their homes in restaurants consuming larger intake of sugar. For this reason, the patients concurrently blamed the newly-emerging lifestyle where the food served nowadays is accompanied by soft drinks which contain a huge amount of sugar.

Another respondent, Zaimah, in her mid-sixties, frustratingly blamed the socio-structural situation where all food items prepared in shops and factories contain some amount of sugar and thus she posed the question as to how we could avoid sugar in that case. In the past, she did not lead a meticulous life, but presently, she maintains a very routined life. Yet she could not give up the culture of eating at restaurants.

Lim Beng Teong, a 53 years old Chinese respondent mentioned that he has been enduring diabetes for more than a decade but now controls his patience for fast food and ice cream. In talking about his past, Lim mentioned that he used to eat a lot of fast food and consume a lot of both soft and hard drinks. Although he has now given up all these habits, he cannot control his diabetes. According to Lim, heredity is also equally accountable for his diabetes.

Suvra, an Indian woman in her 60 also similarly blamed her food habit and lifestyle in the past when she was working as an air hostess where she did not maintain any discipline. At that time, she used to smoke heavily and drink both soft and hard beverages. Coca Cola was her favorite drink which she used to consume after every meal. She also said that none of her family members had diabetes but she has now been afflicted with it as she did not control her life style in the past.

One Chinese respondent, Che Che Meng is a young person of 42-years old. He said that he inherited diabetes from his parents. He frequently eats fast food and also consumes a good amount of hard drinks. But he is not at all depressed about it as he always takes medicine for protection. However, he still blames the food items in the market which contain plenty of sugar. Parameshwaran maintains that from the socio-cultural and religious points of view, Indians are very much fascinated by sweet food at weeding and other cultural and religious ceremonies making it difficult to avoid them.

Table 6(Part-I). FGD Participants: Their Socio-Cultural Background and Narratives in Regard to Having Diabetes

Name	*Age*	*Sex*	*Religion & Ethnicity*	*Occupation*	*Specific reasons identified by the patient himself/herself*
Hamzah	64	Male	Islam (Malay)	Retired govt. employee	Food and changing socio-structural situations.
Lim BengTeong	53	Male	Buddhist (Chinese)	Banker	Food and beverages in the form of soft and hard drinks. Heredity is also responsible for diabetes.
Zaimahbt Alias	64	Female	Islam (Malay)	Housewife	Eating food outside in restaurants and absence of meticulous life style.

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ISSN: 2186-8492, ISSN: 2186-8484 Print
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Table 6(Part-II). FGD Participants: Their Socio-Cultural Background and Narratives in Regard to Having Diabetes

Name	*Age*	*Sex*	*Religion & Ethnicity*	*Occupation*	*Specific reasons identified by the patient himself/herself*
Suvra Rani	60	Female	Hindu (Indian)	Retired	Reckless life, consumption of sweets, having too much soft drinks.
Che Che Meng	42	Male	Buddhist (Chinese)	Business	Food and beverages and also heredity.
Parameshwaran	74	Male	Hindu (Indian)	Retired teacher	Cultural way of life, customs and practices of having sweet food in social and religious ceremonies.

Case # 1: Mr. Haripada Subramaniam

Haripada Subramaniam is a 60-years old Indian Malaysian who is still working as an Executive Officer at the Institute of Diabetics in Kuala Lumpur. Haripada's case study has been incorporated here both as a patient and as an organizational head that provides information about the diabetic patients that he always deals with.

While talking to us, he mentioned that he himself first detected that he had diabetes when he was 50- years old. During those days, he used to remain busy and tensed due to working two jobs and having many tasks and responsibilities. At certain stages, he felt dizzy at the same time found that he was losing weight. A few of his close friends also had the same observation of him. Because of that, he saw a doctor who detected diabetes in him and he was immediately put on medication with two tablets a day.

After having diabetes, Haripada used to feel tired while working, yet he remained busy and continued with his medical treatment of two tablets for his non-insulin dependent diabetes mellitus or NIDDM, popularly known as Type II diabetes. But gradually his sugar level started rising, and then he caught up Type I Diabetes with dependence on insulin every day. Although Haripada identified genetic feature as one factor for diabetes, he however, pinpointed food as the principal contributor to the disease. To reiterate this, he gave an example from his own family where his two younger brothers got diabetes at the age of 30 whereas his own son and daughter were not affected by diabetes at the same age. In regards to his brothers, Haripada mentioned that they were very reckless in their eating habits; they consumed too much carbohydrate and very often took sweets and beverages. On the other hand, his children have not contracted diabetes until now perhaps because he personally takes care of their health and always makes them aware of the disease. Presently, Haripada himself is very cautious about his health which he did not maintain in the past; now he controls his food intake and maintains regularity in taking medicine and doing exercise. According to Haripada, age is no longer the single variable for having diabetes as he observes number of patients of different ages coming to his institute every day and finds many school and college-going students becoming victims to this disease. In procuring their personal information, Haripada noted that many of these young boys and girls return from schools only to stay at home to work with on their computers which limit their physical movement. Even though obese, they never go out for a walk nor do they do any exercise regularly.

Being involved with the institute, Haripada always meets diabetic patients from different ethnic groups affirming him to say that Malays, Chinese and Indians in Malaysia have different ways of living and they have different cultures. For instance, rice, a solid

carbohydrate is the principal food of the Malays which they eat at least two to three times a day. Their curry contains plenty of sugar, testing salt, meat, fish and egg in general, they do not like vegetables. Each and every item of food has considerably high sugar content and to add a drink containing sugar in each of their meal is now part of their culture. Traditionally, Malay festivals include various sweet items in their menu; all their open-houses provide these items as symbols of prestige. But on the other hand, Chinese food is a little different from the Malays where the Chinese prefer noodles and soup putting with many types of vegetables and prawns in them. Haripada also added that since Malays like eating outside their homes; most of the restaurants prepare food that has much sugar and testing salt in it to make it tasty and delicious. The restaurant owners never consider the hygienic part of the food preparation causing effect on their health. Similarly, the Chinese community also has the habit of eating in restaurants but their food is much different from the Malays'. Many Malays are found to be reluctant to do regular exercise unless they are obsessed or are diagnosed as diabetic patients.

Case # 2: Mohammad Azizul Usman

Mohammad Azizul Usman is a 58-year old Muslim Malay working as a Security Personnel at the International Islamic University Malaysia since 2008. Prior to his present job, Mohammad Azizul served as a soldier in the Royal Malaysian Army for about 25 years. He now lives with his wife and his youngest daughter as his eldest daughter is married and living with her husband. Mohammad Azizul's wife was also in the Army serving in the same profession who later quitthe job to return to her husband and their daughters. After leaving the job, Mohammad Azizul's wife studied accounting at University Putra Malaysia and is now working as an accountant. Mohammad Azizul's youngest daughter is also an undergraduate student with a Petronas scholarship to her credit. Mohammad Azizul has also good education with a Diploma in Army. He earns RM4000 a month, owns a house and maintains two cars.

Both Mohammad Azizul and his wife have Type II diabetics and remain under medication. Both husband and wife are prescribed two tablets a day and they maintain a systematic and regular life with self-prepared food-chart as advised by the doctor. Azizul eats all items of food in measured quantity including the sweets and beverages. Both husband and wife go for regular check-ups at the IIUM (International Islamic University Malaysia) Clinic, testing their blood sugar once a month. Mohammad Azizul is also very regular in doing physical exercise and takes long walks around the university campus every day.

CONCLUSION AND RECOMMENDATIONS

Epidemical investigations relating to prevalence factors of diabetes has been continuing with greater importance throughout the world, and thus it has been recognized that there are multiple indicators and risk factors related to it. Based on our empirical data, this paper describes the situational conditions of diabetic prevalence in Malaysia and explains the socio-cultural dimensions and other factors which are also related to it. Based on significant socio-economic variables, the research relates the lifestyles and living conditions of the victim/patients coming from multi-ethnic cultures. Identifying the major causes of diabetes, an overwhelming majority of the respondents however, mentioned that both genetic component and indiscriminate food habits are important susceptible factors for diabetes and many clinical studies have affirmed this relationship with high incidence of the disease in many cultural groups of people around the world. But the study however, could not fully affirm the genetic cause as the overwhelming and prominent factor for Malaysia, as many of the patients' parents and grandparents in the past did not have diabetes in their early age which leads us to believe that diabetes in Malaysia at large is a recent emergence. A rapid

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ISSN: 2186-8492, ISSN: 2186-8484 Print
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transition to over-modernization and westernization from a traditional intensive labour-based cultural way of life to sedentary lifestyles and also having over-dependence on food in restaurants outside homes are causing obesity and thus are typically instigating the increase of diabetes in Malaysia. This has been confirmed through the narratives of the Case Studies and the FGDs documented in this research. Contextually for that reason, the government and policy planners in Malaysia should take note of these factors and find preventive strategies for future protection.

ACKNOWLEDGEMENT

The research reported here is funded by University Brunei Darussalam (UBD) for a joint work conducted by both the authors of this paper; the first author represents IIUM in Malaysia and the second author represents UBD from Brunei Darussalam. The authors are very much grateful to the University Brunei Darussalam for the financial assistance provided to them for this specific research.

ENDNOTES

[1]Among the Southeast Asian countries, the prevalence of diabetes in Malaysia, is found to be alarmingly high and day by day, it has been increasing very rapidly. This is proven in recent increase of patients admitted to hospitals. In 1999, admission of patients in the hospital was 5.76% which increased to 6.23% in 2004 (see Ministry of Health, Malaysia 2007).

[2]Based on an assumption that NIDDM is much related to the genetic factor, Neel (1962) in this context developed his 'thrifty genotype' hypothesis saying that a thrifty gene provides protection against starvation of the people in those regions where food is produced seasonally on the basis of cyclical fluctuations; this type of food availability eventually allows people diabetic carriers to accumulate more calories and sugar than those who are non-carriers of NIDDM. This is proven by a number of studies conducted among the Indian ethnic groups migrating from the Indian sub-continent to the United States where the number of sufferers is found to be comparatively more than Indians to remain in their original settlement (see C.G.N. Mascie-Taylor, 1993).

[3]To maintain anonymity, all names of persons cited here in this research have been changed but other information relating to them, however, remains as it is, based on accuracy as evidenced in the data.

REFERENCES

[1] Chakraborty, R., Ferrel, R. E.,Stern, M. P., Haffness, S. M., Hazuda, H. P.,& Rosenthal, M. (1986). Relationship prevalence non- insulin dependent diabetes mellitus with amerindian admixture of the Mexican-American of San Antonio, Texas. *Genetic Epidemiology,3* (6), 435-454.

[2] Daily Star. (2013). The Daily Star, June 15 (2013), Kuala Lumpur, Malaysia

[3] De Fronzo, R. (1981). Glucose intolerance and aging. *Diabetes Care, 4*, 493-501.

[4] Dunning, T. (2014). *Care of people with diabetes: A manual of nursing practice*. Sussex: Wiley Blackwell.

[5] Gardner, L., Gaskil, S., Haffness, S., Hazinda, H., Stern, M., Rothenford, I., &Eifler, C. (1984). Prevalence of diabetes in Mexican – American: Relationship to percent of gene pool derived from native Americans. *Diabetes,33* (1), 86-92.

[6] Mascie – Taylor, A. (1993). The biological anthropology of disease. In *The anthropology of disease*. New York: Oxford University Press.

[7] Ministry of Health, Malaysia. (2007). *The burden of diabetes mellitus and its related complications in government hospitals in Malaysia* (1999-2004). Putrajaya (Kuala Lumpur): Federal Government Administrative Centre.

[8] Neel, I. V. (1962). Diabetes mellitus: A thrifty genotype rendered determined by progress? *American Journal of Human Genetics,14*, 353-62.

[9] Reaven, G. M., &Reaven, E. P. (1980). Effects of age on various aspects of glucose and insulin metabolism. *Molecular Cellular Biochemistry,31*, 37-47.

[10] Ritenbangh, C., &Goodby, C. (1989). Beyond the thrifty gene: Metabolic implications of prehistoric migration into the new world. *Medical Anthropology,11* (3).

[11] Stern, M. (1987). Overview of diabetes mellitus in starr country. In *Diabetes among Mexican Americans in Texas*. Austin (TX): Texas Diabetes Council.

[12] Thompson, S., & Sandra, M. L. (2000). Trying to keep a balance: The meaning of health and diabetes in an urban Aboriginal community. *Social Science and Medicine, 51*, 1457-1472.

[13] Unger, J. (2013). *Diabetes management in primary care*. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins.

[14] Wiedman, D. W. (1989). Adiposity or longevity: Which factor accounts for the in type II, diabetes Mellitus when populations acculturate to an industrial technology? *Medical Anthropology*, *11* (3).

[15] Wild, S., Roglie, G., Greeb, A. (2004). Global prevalence of diabetes: Estimates for the year 2000 and projection for 2030. *Diabetes Care, 27*, 1047-1053.

[16] World Health Organization (WHO). (2013). *Media center/factsheet.* Geneva: Diabetes Unit, World Health Organization.

Leena and Luna International, Chikusei-shi, Japan.
(株) リナアンドルナインターナショナル, 筑西市,日本
ISSN: 2186-8492, ISSN: 2186-8484 Print
www.ajssh. leena-luna.co.jp