Socioeconomic Impact of Type 2 Diabetes in Imo State, Nigeria

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***Abstract*— This study investigated socioeconomic impact of type 2 diabetes in Imo State, Southeastern Nigeria. Descriptive and analytical study designs were used in this study. Random, target and stratified sampling survey methods were employed for data collection. Sample size consisted 3690 persons from across the state. Research instrument for data collection were questionnaires and test kits for blood sugar, blood pressure and body mass index determination (physical examination). Generated data were put into Tables and Charts. Descriptive Statistics: Percentages, mean and standard deviation were used to measure the level of skewness among data. Coefficient of variation (% CV) was used to measure the variability of data that were obtained from the various LGAs. In terms of income, diabetic patients who earned below 18,000 naira in a month account for 52% of all those living with diabetes. The diabetic patients lived more in the rural area (61%, that is 322±3.49 out of 540) than in the urban area. Most of the diabetic patients found out that they were diabetic at the age range of 41 – 50 years. Considering the duration of the disease, those who have lived with diabetes from 0 – 5 years were most in number consisting 42% (227±1.08 out 540) of all the diabetic patients. Socio-economically, type 2 diabetes negatively impacted the patients on movement as they were restricted from movement due to plyuria, they also poorly performed at work. The patients mostly spent an average of 2,000 naira weekly on drugs and/or diapers, most of which earned less than 18,000 naira monthly. This study revealed that type 2 diabetes has also negatively impact on the socioeconomic life of the people. This indicates that socioeconomic status remains strong predictors of mortality risk among adults living with diabetes.**

Keywords—Type 2 diabetes, socioeconomic, impact, Imo State

I. INTRODUCTION

Socioeconomic status is the social class of person or group of persons. It is often evaluated as a combination of education, income and occupation[1]. The examinations of the socioeconomic effect tend to show inequities in access to resources, as well as some matters of privilege, power and control[2]. The Social and economic factors that may have impact on diabetics are income, education, employment, and community safety[3]. Also, social supports could significantly have impact on how well and how long diabetics may live[4]. Socioeconomic status could be evaluated via an individual's or group's relative position in the society .It hinges on socially derived economic factors[5].

Diabetes mellitus could be referred to as a group of metabolic diseases in which a person has high blood sugar, due to pancreas disorder resulting in the inability to produce enough insulin. It could be due to cells inability to respond to the insulin that is produced[6]. It is an increasing public health problem that knows no boundaries, afflicting people of all sexes in both the developed and developing economies of the world. Though the changing lifestyles and obesity have contributed to the vertiginous rise of type 2 diabetes worldwide. Poverty and under-nutrition, particularly among pregnant women, are also the main drivers. In the past, unaffected regions like Africa, Asia and Latin America, are becoming diabetes 'hotspots'. This report portends bad news for the present and a dire warning for the future and calls for urgent interventions by governments worldwide[7]. According to International Diabetes Federation[8] more than 382 million people have diabetes. Diabetes is very costly in economic as well as in human terms. The threat to global development becomes apparent with current reports which show that more than 80% of the people affected now are living in the developing economies. This therefore identifies diabetes as a major and growing public health issue for developing countries[9].

Diabetes mellitus is a significant and growing global health problem, recognized by the World Health Organization and the International Diabetes Federation. In 2006, the General Assembly of the United Nations unanimously adopted a resolution (61/225) which recognizes that diabetes is a global pandemic posing a serious threat to global health, acknowledging it to be a chronic, debilitating, and costly disease associated with major complications[10]. Diabetes reduces the quality of life, can generate multi-system morbidities and premature death, and

consequently increases healthcare costs. Currently, in many countries, people with diabetes have a significantly decreased life expectancy[11]

Furthermore, diabetes in all its forms especially type 2 diabetes imposes unacceptably high human, social and economic costs on countries at all income levels. Diabetes has become a global health and development crisis. For low- and middle-income countries, where 3 out of 4 people with diabetes now live, the human and financial costs threaten to overwhelm health systems and undermine national economic progress[12]. In addition, many who are living with the disease are not able to cater for themselves financially. This makes the situation very grave. This is coupled with the social stigma that is associated with the disease[13].

Some 382 million people worldwide, or 8.3% of adults, are estimated to have diabetes in which type 2 diabetes accounts for about 90%. About 80% live in low- and middle-income countries. If these trends continue, some 592 million people, or one adult in 10, will have diabetes by 2035. This equates to approximately three new cases every 10 seconds or almost 10 million per year. Furthermore, type 2 diabetes is associated with a lot of complications and attendant socioeconomic problems. It imposes heavy financial burden on afflicted families in its management[14].

In Nigeria, it is estimated that about 5 million persons have diabetes[15]. However, there is paucity of information on its relationship with social economic status in Imo State, Nigeria, where unpublished medical reports indicate a link. This occurs against a background of rapidly changing socio-cultural, and economic indices[16].

The lack of reliable statistical data makes it difficult to create a detailed socioeconomic picture of this debilitating disease in Nigeria. The aim of the present study therefore, is to investigate the socio-economic impacts of type 2 diabetes in Imo State, Nigeria. It is believed that the results of this study will help put into place appropriate interventions for type 2 diabetes management and overall prevention in Imo State, Nigeria

Materials and Methods

Study area

Area of study : The study area is Imo State. Imo State is one of the 36 States of Nigeria, it is located in the Southeast geopolitical zone. Imo State lies within latitudes 4°45'N and 7°15'N, and longitude 6°50'E and 7°25'E with an area of around 5,100 sq km[7].

Research design: Descriptive and analytical study designs were used in this study. This included socioeconomic studies. Descriptive design was used to investigate the socioeconomic status of type 2 diabetes, while analytical design was used to analyse the determinants of the disease distribution including Random clinical examination of people in each of the three (3) senatorial zones of Imo State, namely; Imo North (Okigwe Zone), Imo Central (Owerri Zone) and Imo West (Orlu Zone).

Population

The estimated population is 4.8 million and the population density varies from 230-1,400 people per square kilometer[8]

Survey methods and sampling technique

Random, target and stratified sampling survey methods were employed in this study[17]. Random sampling was used in collecting data from the LGAs.

Sample size

Questionnaire 1: 2700 (100 from each LGA) respondents for the general populace

Method of data collection

Research instrument for data collection were questionnaires and materials such as test stripes, lancets, alcohol pads and glucometers; others are blood pressure measuring kits, measuring tape and weighing balance were used for physical examination.

Questionnaires: Well structured questionnaires were used to obtain data from respondents; the questionnaires were arranged in the following order:

Questionnaire 1

This was used to elicit information from the general populace which include Socioeconomic impact of type 2 diabetes

Ethical consideration

Ethical approval was obtained from Health care institution and the consent of those living with type 2 diabetes was obtained for before they were presented with questionnaires. Similar consent was obtained from the general public before the questionnaires were administered on them.

Statistical analysis

Generated data were put into Tables and Charts. Descriptive Statistics: mean, relative standard error and standard deviation were used to measure the level of skewness among data that were obtained in relation to various parameters that were considered in this study.

Results

This results of socioeconomic impacts of Type 2 diabetes in Imo State, Nigeria", were presented in Tables below.

Socioeconomic impact of type 2 diabetes (1)

The results on the socioeconomic impact of type 2 diabetes (1) are shown in Table 1 below.

The greater number of the participants 1191 (56%) answered positively to the first question in the Table

seen in the first column which stated: 'can type 2 diabetes lead to loss of job?' out of the remaining participants, 659 (31%) had no idea and 266 (13%) answered negatively. This result revealed a very highly statistical significant (p<0.001) loss of job.

According to the responses of the participants, 1204 (50%) participants think that type 2 diabetes cannot lead to desertion of patients by family and friends, 564 (27%) participants think it can and 513 (23%) participants had no idea. A chi-square test having degree of freedom of 52 provided a value of 202.36 which was very highly significant at p<0.001 confidence interval.

Majority of the respondents 1088 (56%) stated 'No' to type 2 diabetes leading to stigmatization of patient, 455 (23%) stated 'Yes' and 420 (21%) stated 'No idea'. A chi-square test having degree of freedom of 52 provided a value of 118.72 which was very highly significant at p<0.001 confidence interval.

Table 1: Socioeconomic impact of type 2 diabetes (1)

	Can type 2 diabetes lead to loss of job?			Can type 2 diabetes lead to desertion of patient by friends and family?			Can type 2 diabetes lead to stigmatization of patient?		
Local Govt. Area	**Yes**	**No**	**No idea**	**Yes**	**No**	**No idea**	**Yes**	**No**	**No idea**
Aboh Mbaise	47	11	15	41	30	14	13	31	10
Ahiazu Mbaise	46	5	11	42	25	8	13	22	23
Ehime Mbano	20	16	18	12	46	16	12	32	8
Ezinihitte Mbaise	28	15	23	25	49	14	18	35	28
Ideato North	35	14	21	16	52	19	17	38	22
Ideato South	41	14	21	21	60	13	15	40	15
Ihitte/Uboma	42	12	25	19	59	21	13	45	17
Ikeduru	38	10	8	18	26	16	16	20	18
IsialaMbano	39	11	22	19	58	17	14	49	18
Isu	50	13	24	21	57	18	11	70	10
Mbaitoli	30	15	15	15	40	15	20	20	10
NgorOkpala	52	6	29	14	49	17	12	38	11
Njaba	61	7	21	15	45	16	13	39	12
Nkwerre	48	8	27	18	47	20	14	40	13
Nwangele	45	7	28	19	49	21	15	41	9
Obowo	42	9	40	18	50	21	16	45	11
Oguta	40	10	35	21	53	20	17	49	10
Ohaji/Egbema	38	8	28	22	54	20	19	48	12
Okigwe	42	6	35	21	50	19	21	49	11
Onuimo	43	5	25	18	60	18	20	48	13
Orlu	70	12	12	36	48	11	26	39	27
Orsu	49	7	28	19	48	21	22	41	14
Oru East	52	9	27	20	49	22	23	42	19
Oru West	53	8	22	22	50	24	19	49	14
Owerri Municipal	45	9	23	19	55	18	17	48	15
Owerri North	39	7	49	12	23	57	21	23	35
Owerri West	56	12	27	21	63	17	18	47	15
Total	**1191 (56%)**	**266 (13%)**	**659 (23%)**	**564 (23%)**	**1204 (56%)**	**513 (27%)**	**455 (23%)**	**1088 (56%)**	**420 (21%)**
Mean	**44**	**10**	**24**	**21**	**48**	**19**	**17**	**41**	**16**
St. D	**±10.2**	**±3.2**	**±8.8**	**±7.5**	**±10.7**	**±8.3**	**±3.82**	**±10.9**	**±6.6**
X^2-value (p-value)	**129.45 (p<0.001)*** DF=52**			**202.36 (p<0.001)*** DF=52**			**118.72 (p<0.001)*** DF=52)**		

***=Very highly significant at p<0.001

Socioeconomic impact of type 2 diabetes (2)

Table 3 seen below presents the Socioeconomic impact of type 2 diabetes (2) according to the responses of the participants.

The results showed that majority of the respondents 1237 (63%) agreed that type 2 diabetes can lead to poor performance of patients at work, 453 (23%) had no idea and only 280 (14%) of the respondents disagreed. A chi-square test of significance gave a value of 55.65 (p=0.339) which was not significant at p=0.05.

To the statement used in the questionnaire to assess if type 2 diabetes can lead to loss of resources due to cost of drugs and diapers, over half of the

respondents 1326 (62%) stated 'Yes', 408 (19%) stated 'No idea' and only 398 (19%) of the respondents stated 'No'. A chi-square test having degree of freedom of 52 provided a value of 89.65 which was very highly significant at p<0.001 confidence interval.

Table 2: Socioeconomic impact of type 2 diabetes (2)

	Can type 2 diabetes lead to poor performance of patients at work?			Can type 2 diabetes lead to loss of resources due to cost of drugs and diapers?		
Local Govt. Area	Yes	No	No idea	Yes	No	No idea
Aboh Mbaise	43	17	9	52	11	8
Ahiazu Mbaise	35	6	12	34	16	13
Ehime Mbano	24	3	8	42	17	16
Ezinihitte Mbaise	43	9	13	45	11	13
Ideato North	42	5	14	49	12	12
Ideato South	43	4	15	51	13	10
Ihitte/Uboma	44	9	18	49	14	19
Ikeduru	40	4	10	44	14	8
IsialaMbano	54	11	19	44	15	10
Isu	52	12	20	48	16	11
Mbaitoli	50	5	10	50	13	15
NgorOkpala	50	13	21	47	15	12
Njaba	49	10	19	47	16	13
Nkwerre	42	9	18	48	17	15
Nwangele	48	8	19	39	18	16
Obowo	47	10	17	41	17	12
Oguta	48	11	16	42	19	18
Ohaji/Egbema	41	12	17	40	20	17
Okigwe	42	13	18	44	19	18
Onuimo	42	14	19	43	21	19
Orlu	85	13	21	60	11	25
Orsu	43	17	20	71	9	18
Oru East	44	14	19	61	13	12
Oru West	45	15	18	70	17	10
Owerri Municipal	46	18	19	59	13	14
Owerri North	46	2	23	52	6	40
Owerri West	49	16	21	54	15	14
Total	**1237 (62.7%)**	**280 (14.2%)**	**453 (22.9%)**	**1326 (62.2%)**	**398 (18.7%)**	**408 (19.1%)**
Mean	**46**	**10**	**17**	**49**	**15**	**15**
St. D	**±9.7**	**±4.6**	**±4.05**	**±8.9**	**±3.4**	**±9.2**
X^2-value (p-value)	**55.65 (p=0.339)^{NS} DF=52**			**89.65 (p<0.001)*** DF=52**		

NS=Not significant at p=0.05; ***=Very highly significant at p<0.001

Socioeconomic impact of type 2 diabetes (3)

The Socioeconomic impact of type 2 diabetes (3) is shown in Table 3 below

To the questionnaire item which stated 'can type 2 diabetes lead to restricted movement due to polyuria', more than half of the respondents 1131 (56%) answered in the affirmative, 462 (23%) of the respondents stated 'No idea', and 413 (21%) stated 'No'. A chi-square test having degree of freedom of 52 provided a value of 46.14 (p=0.703) which was not significant at p=0.05.

The results showed that 1010 (44%) respondents answered positively to being poor contributes to type 2 diabetes, 693 (30%) answered negatively and 579 (26%) respondents had no idea. A chi-square test having degree of freedom of 52 provided a value of 393.14 (p<0.001) which was very highly significant at p<0.001.

The results showed that 1042 (42%) respondents stated 'Yes' to being rich contributes to type 2 diabetes, 837 (34%) stated No, and 580 (24%) respondents stated 'No idea'. A chi-square test having degree of freedom of 52 provided a value of 527.61 (p<0.001) which was very highly significant at p<0.001.

Table 3: Socioeconomic impact of type 2 diabetes (3)

	Can type 2 diabetes lead to restricted movement due to polyuria?			Does being poor contribute to type 2 diabetes?			Does being rich contribute to type 2 diabetes?		
Local Govt. Area	Yes	No	No idea	Yes	No	No idea	Yes	No	No idea
Aboh Mbaise	51	17	26	16	12	35	21	48	14
Ahiazu Mbaise	36	12	13	22	13	14	11	43	25
Ehime Mbano	46	14	18	44	16	18	14	46	18
Ezinihitte Mbaise	47	10	15	54	11	23	50	29	17
Ideato North	52	14	17	25	49	18	14	55	19
Ideato South	48	18	21	30	47	13	60	21	12
Ihitte/Uboma	49	19	20	48	19	27	15	71	10
Ikeduru	40	20	12	32	10	12	54	16	16
IsialaMbano	48	22	21	47	19	28	28	55	19
Isu	47	23	24	38	10	27	53	24	13
Mbaitoli	35	15	20	20	55	20	45	20	20
NgorOkpala	42	15	17	59	11	19	25	48	23
Njaba	43	13	14	49	17	16	19	51	28
Nkwerre	44	16	15	25	48	12	55	25	19
Nwangele	45	17	18	28	42	14	25	45	18
Obowo	46	14	19	46	32	11	49	16	25
Oguta	47	15	16	35	11	29	52	18	22
Ohaji/Egbema	48	17	19	48	28	10	50	19	21
Okigwe	49	19	16	32	49	13	60	25	13
Onuimo	50	12	16	38	44	18	61	20	14
Orlu	70	10	19	48	11	34	49	10	37
Orsu	53	17	11	58	21	11	59	11	21
Oru East	54	14	12	46	28	14	45	28	19
Oru West	55	15	13	44	22	18	48	27	17
Owerri Municipal	65	12	17	27	18	49	28	11	48
Owerri North	53	13	15	21	22	34	23	12	45
Owerri West	68	10	18	30	28	42	29	43	27
Total	**1131 (56%)**	**413 (21%)**	**462 (23%)**	**1010 (44%)**	**693 (30%)**	**579 (26%)**	**1042 (42%)**	**837 (34%)**	**580 (24%)**
Mean	**49**	**15**	**17**	**37**	**26**	**21**	**39**	**31**	**22**
St. D	**±8.2**	**±3.4**	**±3.5**	**±12.2**	**±14.7**	**±10.3**	**±17.0**	**±16.8**	**±9.2**
X^2-value (p-value)	**46.14 (p=0.703)^{NS} DF=52**			**393.14 (p<0.001)*** DF=52**			**527.61 (p<0.001)*** DF=52**		

NS=Not significant at p<0.001

Socioeconomic impact of type 2 diabetes (4)

The Socioeconomic impact of type 2 diabetes (4) is displayed in Table 2 below.

On whether type 2 diabetes contributes to anxiety/worry in patients, 1329 (59%) respondents agreed that it does, 528 (23%) had no idea and 403 (18%) disagreed. A chi-square of test of significance having degree of freedom of 52 provided a value of 313.25 which was very highly significant at p<0.001.

When asked if type 2 diabetes contributes to depression in patients, 1275 (50%) respondents which represented the highest number of participants answered positively, 682 (27%) respondents had no idea and 579 (23%) respondents answered negatively. A chi-square of test of significance having degree of freedom of 52 provided a value of 564.29 which was very highly significant at p<0.001.

Table 4: Socioeconomic impact of type 2 diabetes (4)

	Does type 2 diabetes contribute to anxiety/worry in patient?			Does type 2 diabetes contribute to depression in patients?		
Local Govt. Area	Yes	No	No idea	Yes	No	No idea
Aboh Mbaise	58	10	15	25	17	49
Ahiazu Mbaise	35	12	11	39	14	16
Ehime Mbano	76	14	8	62	14	12
Ezinihitte Mbaise	49	13	11	51	13	22
Ideato North	58	14	10	48	23	14
Ideato South	46	12	18	49	17	29
Ihitte/Uboma	55	14	15	38	23	14
Ikeduru	34	8	14	40	12	12
IsialaMbano	56	15	20	60	15	15
Isu	59	11	14	59	22	18
Mbaitoli	40	10	15	45	15	10
NgorOkpala	60	14	15	22	60	13
Njaba	53	18	17	21	58	17
Nkwerre	52	19	20	60	14	21
Nwangele	47	22	17	62	13	12
Obowo	48	16	21	51	14	18
Oguta	43	23	18	49	18	16
Ohaji/Egbema	47	29	13	58	11	19
Okigwe	49	14	22	52	21	22
Onuimo	46	23	13	60	21	14
Orlu	81	4	13	61	12	133
Orsu	55	21	11	48	22	21
Oru East	52	21	18	57	21	17
Oru West	53	19	20	52	17	28
Owerri Municipal	30	12	49	33	28	59
Owerri North	24	5	53	34	15	49
Owerri West	23	10	57	39	49	12
Total	**1329 (59%)**	**403 (18%)**	**528 (23%)**	**1275 (50%)**	**579 (23%)**	**682 (27%)**
Mean	**49**	**15**	**20**	**47**	**21**	**25**
St. D	**±13.2**	**±5.8**	**±12.6**	**±12.4**	**±13.1**	**±24.8**
X^2-value (p-value)		**313.25 (p<0.001)*** DF=52**			**564.29 (p<0.001)***	

***=Very highly significant at p<0.001

Discussion

Type 2 diabetes has been found to impact the people of Imo State negatively. In other studies, socioeconomic status has been assessed by several indicators that may represent different dimensions of the socioeconomic status[17], occupation, education, income or area deprivation [18]

Socio-economic impact assessment of a diabetes designed to evaluate the effect of such a disease/illness (diabetes mellitus) on a community's social and economic improvement. It indicates the study of the effect of diabetes on the social well being of the patients living with diabetes mellitus and the effect of the disease on their finances. Socio-economic also studies the relationship between economic activity and social life. It narrows more on behavioural interaction of individuals and group through social life and capital[19]

Type 2 diabetes has been found to be one of the reasons why people don't perform maximally at work. Type 2 diabetes is more prevalent in lower socioeconomic groups in Western societies[20]. Obesity, physical inactivity, and smoking are implicated in the development of type 2 diabetes[21] and are also associated with low socioeconomic position[22].

Type 2 diabetes has equally posed restriction of movement among type 2 diabetic patients due to polyuria. It therefore means that it reduces the rate of socialization among the people[16].

Type 2 diabetes has also led to loss of resources as indicated in this study. For instance, type 2 diabetes patients in Imo State spend between 2 000 to 4 000 naira on weekly basis. That means some patients spent as much as 16 000 naira or more in a month. This definitely makes it obvious that type 2 diabetes negatively impacts on the resources of the patients. It has been reported that about 4 billion dollars is spent annually in combating diabetes

scourge globally; this figure is expected to increase in the coming years[23]

Several mechanisms have been proposed to explain the relationships between socioeconomic status and diabetes outcomes. These include poorer access to care, competing demands, financial barriers, poorer quality of life, and worse health behaviors and stress with subsequent hormonal changes[18].

Socioeconomically, type 2 diabetes negatively impacted on the patients resources, it reduced their locomotive activities due to polyuria. It also brought about poor performance at work thereby reducing productivity of those affected by type 2 diabetes[23].

Conclusion

Types 2 diabetes is fast ravaging the health of the people of Imo State with many persons living with the diseases, yet are unaware of it. It has also negatively impacted on the socioeconomic life of the people.

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