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Socio-Demographic Characteristics, Health Beliefs and Diabetes Management among the Igala, Nigeria

Samuel Ojima Adejoh
Department of Sociology, University of Lagos, Lagos, Nigeria

Abstract: This study examined the correlation between socio-demographic characteristics, health beliefs and diabetes management using the main concepts of Health Belief Model among the Igala, Nigeria and also examined the role of these variables in predicting diabetes management. Data were collected using structured questionnaire administered on 152 respondents with diabetes. The data were analyzed using SPSS. Age (-0.301, $p<0.000$), household size (-0.233, $p<0.004$), place of residence (-0.199, $p<0.014$) all had negative correlations with diabetes management. There was a moderate correlation between perceived severity (0.583, $p<0.000$), weak and negative correlation between perceived benefits (-0.210, $p<0.009$), weak correlation between perceived barriers (193, $p<0.017$) and weak correlation between aggregate HBM (195, $p<0.016$) and diabetes management. The aggregate HBM would predict diabetes management ($\beta = 0.159$, $p<0.000$) after controlling for socio-demographic variables, diabetes knowledge and perception. Though health belief is a factor in predicting diabetes management, this should not be considered in isolation of other social factors.

Key words: Diabetes mellitus, health beliefs, household size, place of residence, Igala, Nigeria

INTRODUCTION

Despite the tremendous success at improving the lives of those with diabetes through technological breakthrough in biomedical sciences, management of type 2 diabetes lies largely with those with the disease. These include practices that must be carried out by the patients themselves. Such practices include following dietary plan, physical exercise taking medication as prescribed, monitoring of blood glucose level, regular clinic visits among other practices. However, performing these practices has remained problematic for those with the condition since it requires behavioral changes. While studies on social and psychological factors are abound in more developed nations to explicate the reasons behind why these practices has remained problematic, little is known about the situation in the third world countries including Nigeria.

If people with diabetes are to follow their physicians' recommendations, it then becomes imperative to understand their beliefs about diabetes and why they do not follow their physician recommendations. Health Belief Model is one of the models used in understanding motivators of behavior as it relate to diabetes management. Understanding the motivators for following physicians' recommendations using HBM would help in designing an effective intervention programs for those with diabetes. Against this background, this study was conducted to understand why individuals with diabetes do not follow their physicians' recommendations regarding their diabetes management by examining their socio-demographic characteristics and health beliefs using Health Belief Model. The objectives of this study were to examine the correlations between socio-demographic characteristics and health beliefs of those with diabetes using Health Belief Model's construct and diabetes management. And also to examine the role of socio-demographic and health belief variables in predicting diabetes management of those with diabetes among the Igala, Nigeria. The Igala ethnic group is one of the ethnic groups in North-central Nigeria. The Igala people are found around the triangle formed by the confluence of the River Niger and River Benue and are located East of the confluence. Boston (1969) likens the location of the Igala to Poland in Europe which seems to have been pulled in different directions at different periods. They still hold on to their traditions including beliefs that traditional medicines can cure all kinds of illnesses. There are no data on the incidence and prevalence of diabetes among the Igala except the national prevalence rate of 3.9% as estimated by the (International Diabetes Federation, 2009) for Nigeria. In addition, literature search show that no study has been conducted among the Igala in relation to diabetes and its management.

Theoretical framework: Health Belief Model was developed in the 1950s by Rosenstock to find out why people were not utilizing the availability of biomedical

advances of the time. The model was a direct fallout of non-utilization of the Salk vaccine after it became available and attempts to identify why people were not utilizing the services (Rosenstock *et al*., 1959). The model is an attempt to explain, understand and predict behavior of individuals as it concerns preventive health activities (Rosenstock, 1960). The model examines both internal and external motivators that direct behavior. The HBM is divided into three categories:

- Individual perceptions: this describes the patients' perceptions of the seriousness of a disease and their susceptibility to it
- Likelihood of action is determined by the perceived barriers and benefits of a healthcare practice
- Modifying factors: this describes individual characteristics and experiences that have impact on an individual's healthcare choices. This category is made up of characteristics that are not directly related to perceptions of illness or healthcare provision. For example, demographic information, socio-psychological variable and cue to action on health issues for instance advertising campaigns, doctors' recommendations, age, education, family background among others. Some of these variables do overlap from time to time

HBM as revised by Becker and Maiman (1975) can be used to explicate self-care activities and has a focus on behavior related to the prevention of disease. The foundation of the HBM is that individuals will take action to prevent, control or treat a health problem if:

- They perceive the problem to be severe in nature. The model assumes that individuals are more likely to participate or engage in preventive behavior if there were a perceived susceptibility to illness and perceived severity. Health behavior is motivated by the perceived severity of having a particular illness. The consequences of leaving the illness untreated often times will determine behavior (Strecher and Rosenstock, 1997). In this case, the perceived consequences of the complications of diabetes may motivate the individuals to follow their doctors' recommendations
- They perceived that the action will yield or produce an expected outcome. According to Rosenstock (1960) health seeking behavior is motivated by an individual's perception of outcomes. If an individual does not perceive a benefit from screening or treatment, participation is less likely to occur. Also if there are perceived benefits from seeking screening or treatment, it is more inclined to participate in such programme (Rosenstock, 1960). Perceived benefits include potential effectiveness and safety of a treatment. In this case of diabetes, if following doctors' recommendations will not interfere with daily activities and allow the individuals to live a normal life then it is likely that patients will follow the recommendations
- If they perceived few or no barriers to taking a particular action. According to Rosenstock if a conflict exists between two actions the one perceived to be most important will occur and act as a barrier to other less important behavior. Certain external factors have been identified as barriers to seeking care. These include available resources and services expectations, such as money, transportation and availability of healthcare services, quality and quantity of services in the community. Also perceived negative consequences of therapy could act as a potential barrier

MATERIALS AND METHODS

A convenient sample of 152 cases of people with diabetes participated in the study. The respondents were selected from seven hospitals owned by governments and faith-based organizations in Kogi East senatorial district. The respondents were approached as they come in to see their doctors or had come to have a blood glucose test. The criteria for inclusion includes that the individual must have been diagnosed by a medical doctor as having diabetes must be attending clinics for treatment and check-ups and must be mentally sound to respond to questions and above all must give a voluntarily consent to participate in the study. The study was approved by the ethical committee of Kogi State Ministry of Health.

Procedure: Data for the study were collected through structured questionnaire administered as both interview and self-administered. The questionnaire includes questions on socio-demographic characteristics, diabetes knowledge test, attitude, practices, perception and diabetes health beliefs model as developed by Given *et al*. (1983) on perceived susceptibility perceived severity, perceived benefits and perceived barriers to measure the beliefs about diabetes from those with the condition. The study was conducted between august 2008 to December, 2009.

RESULTS AND DISCUSSION

Chi-square and correlation coefficients were used for the bivariate analysis to examine the associations

between socio-demographic characteristics, each of the sub-variables of the HBM, the aggregate HBM variables and diabetes management while regression was conducted to know if the aggregate HBM variables would predict diabetes management after controlling for socio-demographic variables, diabetes knowledge and perceptions.

Socio-demographic characteristics: About 53.9% of the respondents were women while 46% were men. Respondents' mean age was 56.20. The mean age supports Nyenwe *et al.* (2003) who state that diabetes was more frequently found in people aged 50 years and above in Nigeria. The 28.9% had no formal education; 23.1% had primary education; 18.4% with secondary education and 26.3% post-secondary education. About 34.2% were civil servants; 18.4% were self-employed; 14% were retiree and 14.5% were not in any paid employment while 11.8% were house wives (Fig. 1).

Health belief

Perceived susceptibility: Participants responded to four items about their perceived susceptibility to complications (e.g., my diabetes would be worse if I did nothing about it). Agreement ith each item was indicated on a five-point scale ranging from 1 strongly disagree to 5 strongly agree. The mean of the item served as a measure of perceived susceptibility (Mean = 17.11, SD = 2.08). Higher scores indicated ability of the patient to control his or her diabetes.

Table 1 shows that 40 and 55.6% of those with low and high perception of their susceptibility to diabetes complications had poor diabetes management status respectively, compared to 60 and 44.4% of those with low and high perception of their susceptibility to diabetes complications with good diabetes management, respectively.

Perceived severity: Respondents reported their beliefs of severity of their diabetes by rating how serious their diabetes will have bad effect on their future health (e.g., my diabetes will cause me to be sick a lot). The means of this ratings served as measures of perceived severity (Mean = 13.38, SD = 2.07) four items assessed perceived severity on a scale of five-point scale ranging from strongly disagree to strongly agree. Table 1 shows that 73.2 and 17.1% of those with low and high perception of severity had poor diabetes management status, respectively while 26.8 and 82.9% of those with low and high perception of severity of diabetes had good diabetes

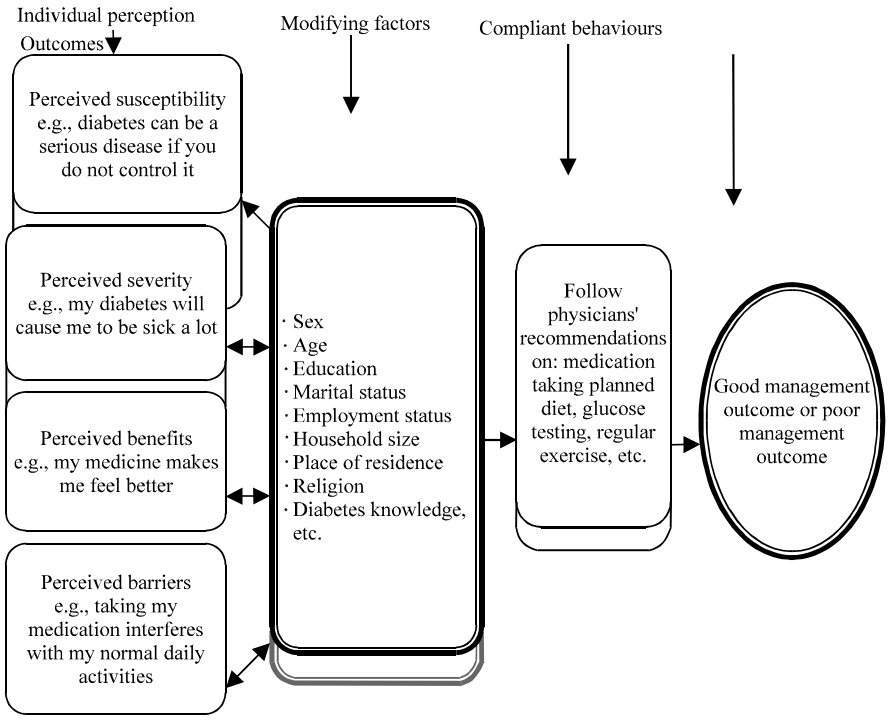

Fig. 1: Hypothesized model for explaining diabetes management status using the four main variables of HBM

Table 1: Distribution of respondents by HBM variables, aggregate HBM and diabetes management

HBM variables (perceived susceptibility)	Diabetes management status			df	χ^2	p-value
	Poor	Good	Total			
Low	32 (40.0)	48 (60.0)	80 (100.0)	-	-	-
High	48 (55.6)	32 (44.4)	72 (100.0)	1	3.678	0.055
Total	72 (47.4)	80 (52.6)	152 (100.0)	-	-	-
Perceived severity						
Low	60 (73.2)	22 (26.8)	82 (100.0)	-	-	-
High	12 (17.1)	58 (82.9)	70 (100.0)	1	47.549	0.000
Total	72 (47.4)	80 (52.6)	152 (100.0)	-	-	-
Perceived benefits						
Low	30 (34.9)	56 (65.1)	86 (100.0)	-	-	-
High	42 (63.6)	24 (36.4)	66 (100.0)	1	12.383	0.000
Total	72 (47.4)	80 (52.6)	152 (100.0)	-	-	-
Perceived barriers						
Low	38 (54.3)	32 (45.7)	70 (100.0)	-	-	-
high	34 (41.5)	48 (58.5)	82 (100.0)	1	2.490	0.115
Total	72 (47.4)	80 (52.6)	152 (100.0)	-	-	-
Aggregate HBM						
Low	28 (42.4)	38 (57.6)	66 (100.0)	-	-	-
high	44 (51.2)	42 (48.8)	80 (100.0)	1	1.144	0.285
Total	72 (47.4)	80 (52.6)	152 (100.0)	-	-	-

management status, respectively. The analysis shows a significant relationship between perception of severity and diabetes management $p<0.000$.

Perceived benefits: Four items were used to measure perceived benefits of taking action by the respondents. For example, I believe I can control my diabetes to my medicine would make me feel better on five point scale of strongly disagree to strongly agree. The mean of the four item served as the measure of perceived benefits (Mean = 17.16, SD = 2.20). The analysis shows that 34.9 and 63.6% of those with low and high perceived benefits had poor diabetes management status, respectively while 65.1 and 36.4% of those with low and high perceived benefits of following biomedical recommendation had good diabetes management status, respectively. The statistics shows a significant relationship between perceived benefits and diabetes management $p<0.000$.

Perceived barriers: Respondents rated four items acting as barriers to diabetes management on a five-points scale ranging from strongly disagree to strongly agree. For example, I would have to change too many habits to follow my prescriptions to following prescriptions interfere with my normal daily activities. The mean of the rating was used to measure perceived barriers (Mean = 11.88, SD = 2.48) higher scores showed more barriers to diabetes management. Table 1 shows that 54.3 and 41.5% of those with low and high perceived barriers had poor management status, respectively while 45.7 and 58.5% of those with low and high perceived barriers to following recommendations had good management status, respectively. The Chi-square result shows no significant relationship between perceived barriers and diabetes management.

Table 2: Correlation of HBM sub-scales and aggregate of all HBM sub-scales and diabetes management

Health beliefs construct	Statistical analysis	Values
Perceived susceptibility	Person correlation	-121*
	Sig. (2-tailed)	0.139
	N	152
Perceived severity	Person correlation	0.583*
	Sig. (2-tailed)	0.000
	N	152
Perceived benefits	Person correlation	-210*
	Sig. (2-tailed)	0.009
	N	152
Perceived barriers	Person correlation	0.193*
	Sig. (2-tailed)	0.017
	N	152
Aggregate HBM	Person correlation	0.195*
	Sig. (2-tailed)	0.016
	N	152

*Correlation is significant at the 0.05 level

The result on the aggregate of the all sub-scales of HBM shows that 42.4 and 51.2% of those with low and high perception of health belief had poor diabetes management status, respectively while 57.6 and 48.8% of those with low and high perception of health belief had good management status. The result shows that statistically there is no relationship between the aggregate Health Belief Model and diabetes management. Table 2 shows negative and significant correlations between age (-0.301, $p<0.000$), household size (-0.233, $p<0.004$), place of residence (-0.199, $p<0.014$) and diabetes management. While not been married (0.275, $p<0.001$) had a positive and significant relationship on diabetes management. The correlation coefficients for health beliefs show statistically

significant moderate to weak correlations for three of the sub-scales of HBM and the aggregate HBM. There was a moderate correlation between perceived severity (0.583, p<0.000), negative and weak correlation between perceived benefits (-0.210 p<0.009), weak correlation between perceived barriers (0.195, p<0.017) and weak correlation between aggregate HBM (0.195, p<0.016) and diabetes management. It means that as perceived belief about severity and barriers about the complications of diabetes increases so also the management status increases. However, perceived benefits (-210, p<0.009) means that the higher the perceived benefits the poorer the diabetes management. In essence as the individuals beliefs about diabetes and its complications determine how he or she performs the physician's recommendations. The aggregate health belief shows that there is a correlation, thou a weak relationship between the health belief of an individual with diabetes and its management. In essence, there is a very weak correlation between health beliefs and performance of physician recommendations, hence implying that other factors could be responsible for their diabetes management or performance of physicians' recommendations.

Regression analysis: A further analysis to see the impact of modifying factors was carried out. This controls for socio-demographic factors, diabetes knowledge and perception. Table 3 shows that the adjusted R^2 value of 0.551 implies that sex, age, education, marital status, employment status, household size, religion, diabetes knowledge, perception of diabetes and health belief will account or explain 55.1% of the variance in diabetes management. In essence, the table reveals a significant joint impact of socio-demographic characteristics, diabetes knowledge, perception and health beliefs on diabetes management (R = 0.766, p<0.05). The multiple regression coefficient, R^2 = 0.586, adjusted R^2 = 0.551. The result also shows that the composite influence of all the factors did not just occur by chance as the analysis of variance reveals significant impact of independent variables on diabetes management (F = 12, 151) = 16.418, p<0.05).

Table 4 shows further analysis by controlling for some variables to see if the result of HBM was a result of specified modifying factors. The results show that household size (β = 0.091, t = 3.085, p<0.002); place of residence (β = -0.641, t-1.987, p<0.049); religion (β = 0.592, t, 2.275, p<0.024); diabetes knowledge (β = 0.200, t = 2.771, p<0.006); perception (β = 0.091, t = 6.290, p<0.006) and HB (β = 0.159, t = 6.023, p<0.000) were found to be a strong predictor of diabetes management status. Sex, age and educational attainment were statistically insignificant.

Table 3: Joint influence of socio-demographic factors, diabetes knowledge, perception and health belief on diabetes management

Models	Sum of squares	df	Mean square	F-value	Sig.
Regression	355.311	12	29.609	16.418	0.000
Residual	250.689	139	1.804	-	-
Total	606.000	151	-	-	-

Predictors: constant like sex, age, education, marital status, employment status, household size, place of residence, religion, diabetes knowledge, perception and health belief ; Dependent variable: Diabetes management status; Model summary; R = 0.766; R^2 = 0.586; Adjusted R^2 = 0.551; Std. Error of the estimate = 1.34

Table 4: Ralative influence of social-demographic characteristics, diabetes knowledge, perceptions and health beliefs on diabetes management

	Unstandardized coefficients		Standardized coefficients		
Characteristics	B	SE	Beta	t-value	Sig.
Constant	-11.04900	2.218	-	-4.982	0.000
Male female	-0.28800	0.270	-0.072	-1.068	0.287
Age in years	-0.06175	0.011	-0.034	-0.549	0.584
Education years	-0.03091	0.030	-0.103	-1.014	0.312
Single married	0.29200	0.371	0.047	0.787	0.433
Govt. Job unemployed	-0.38000	0.414	-0.090	-0.918	0.360
Private Job unemployed	-0.46800	0.346	-0.114	-1.353	0.178
Household size	0.09161	0.030	0.201	3.085	0.002
Town Rural	-0.64100	0.323	-0.160	-1.987	0.049
Christianity other religion	0.59200	0.260	0.148	2.275	0.024
Knowledge	0.20000	0.072	0.213	2.771	0.006
Perception	0.09190	0.150	0.534	6.290	0.000
Health belief	0.15900	0.026	0.395	6.023	0.000

DISCUSSION

As the findings show, perceived severity and perceived benefits were associated with diabetes management. This may be explained by the fact that not all the construct of health beliefs model would directly affect diabetes management rather other factors such as socio-demographic variables; diabetes knowledge; perception; psychosocial factors; patients' factors and cultural beliefs (Nam *et al*., 2011; Rane *et al*., 2011; Sowattanangoon *et al*., 2009) would have to be present to activate the beliefs as indicated by the regression result. Therefore, socio-demographic variables, diabetes knowledge and perceptions were also examined as studies have demonstrated that these variables influence preventive behavior in health studies. The present study found household size, place of residence, religion, diabetes knowledge and perception as having significant impact on diabetes management.

Household size: The result indicates that there is a positive relationship between household size and diabetes management status. The result shows that those with larger households' sizes manage better than those with smaller households sizes. This may be attributed to

the fact that there are more people in the household which may serve as an important social resource in coping with diabetes. Members of the household may assist the individual with clinic visits, provision of tangible assistance like buying of drugs, informational support like providing new information from networks of friends and family kin and emotional support like empathising, reassurance and continuous support. More importantly, it is also expected that members of the household are more likely to pull resources together to assist the individual involved in managing the condition.

On place of residence, the quantitative data shows that those in urban areas manage poorer than those in the rural areas. This is because those in the urban areas are likely to have higher expenditure on rents, bills, transportation, etc. and may likely have little left to care for health-related issues. This finding is supported by (Popkin, 1998) that demonstrates that urbanisation is associated with drastic decrease in physical activity, changes in dietary habits and additional psychological stress.

Perception of diabetes by participants had positive influence on diabetes management status (β = 0.091, $p<0.05$). The result shows that those with good sense of perceptions of diabetes managed better or had good management status compared to those in the reference category those with poor sense of perception. In essence, respondents' beliefs about the causes, consequences and controallability of their diabetes are significantly related to good general diabetes management status.

The findings of this study is in line with a meta-analytic review of 16 studies using HBM variables that found that the individual components (severity, susceptibility, benefits and barriers), each only accounted for 0.5-4% of the variance in behavior (Harrison *et al*., 1992). For the present study, the HBM that related with diabetes management were perceived severity and perceived benefits, suggesting that those patients who perceived (for example that diabetes can cause severe complications) are more likely to be engaged in management activities.

Study by Garcia and Mann (2003) has also confirmed the predictability of three variables out of the four variables where susceptibility, barriers and benefits explained 43% of the variance of intention to resist dieting. While Nejad *et al*. (2005) confirmed that the best predictors of weight loss were perceived susceptibility and perceived benefits while perceived benefits of dieting and severity (a measure of how negatively weight gain is perceived) significantly predicted intention to diet.

CONCLUSION

Based on the results from this study using HBM, it can be said that HBM alone is a poor predictor of diabetes management among those with diabetes in the studied population. This is illustrated as only perceived severity and perceived benefits had significant relationships with diabetes management. The value expectancy assumption of the model seems weak among the study respondents and this could be linked to the belief among the Igala that all diseases are curable using local herbs from competent herbalists. This result supports finding by Adejoh (2011) among the Igala where there is a strong belief in Igala medicine in curing all kinds of diseases, this could have implications for how individual would manage his or her condition. Hence, using HBM alone could be misleading and lead to wrong decision and judgment.

LIMITATIONS

The study only takes a convenient sample from one ethnic group in an ethnically diverse region and so the generalization of these findings must be with caution. Secondly, the responses to all the questions were all self-reports and so there could be the problem of recall from the respondents which might make the reliability of the responses difficult to validate.

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