FACTORS ASSOCIATED WITH FATTY LIVER DISEASE AND SELF-MANAGEMENT STRATEGIES AMONG DIAGNOSED PATIENTS IN SELECTED TEACHING HOSPITALS IN OGUN STATE, NIGERIA

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ABSTRACT

This study assessed the factors associated with Fatty Liver Disease and self-management strategies among diagnosed patients in selected teaching hospitals in Ogun State, Nigeria. A cross sectional descriptive design was utilized for the study using a sample of 244 diagnosed patients. A structured and validated questionnaire was used at both BUTH and OOUTH respectively. Data was analyzed using descriptive, and Chi-square statistics at 5% level of significance. The findings showed that most respondents were between 50–60 years (37.3%), female (54.5%), and had secondary school education (33.6%). About 35.2% had been diagnosed within six months and 47.5% discovered the condition during routine check-ups. Additionally, the chi-square value obtained for level of education is ($x^2 = 71.803$, p = .000 < .05); religion ($x^2 = 39.999$, p = .000 < .05); ethnicity ($x^2 = 26.345$, p = .000 < .05); average monthly Income ($x^2 = 30.009$, p = .000 < .05); duration of diagnosis ($x^2 = 21.087$, p = .017 < .05); and family member been diagnosed ($x^2 = 18.876$, p = .000 < .05) were significant at less than 0.05. Also, there is a significant relationship between perceived severity of fatty liver disease and self-management strategies among diagnosed patients ($x^2 = 53.269$, p = .000 < .05). The study concluded that patient education and awareness are crucial for successful self-management. Additionally, the community, family, and medical professionals' support increases treatment plan acceptance and adherence, which inevitably raises overall quality of life.

Keywords: Fatty Liver Disease, Socio-demographic, Self-management Strategies

Introduction

The emergence of fatty liver disease (FLD) with a prevalence of approximately 25% of the population and with increased incidence in both developed and developing countries has become a significant public health concern. Globally, NAFLD affects approximately 30% of individuals in Western countries and 10% in Asia. It is of note that in the U.S., about 7% of the population has the more severe form which is the nonalcoholic steatohepatitis (NASH). By projection, there is a continuous rise in both NAFLD and NASH cases. Using Markov prediction model for individuals with NAFLD in the U.S, there is an estimated increase of 21% from 83 million in 2015 to 101 million by 2030. In a like manner, an expected increase in NASH cases is 63%, from 17 million in 2015 to 27 million by 2030. This surge is anticipated to lead to a significant

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rise in advanced liver diseases including a 168% rise in decompensated cirrhosis and a 137% increase in hepatocellular carcinoma by 2030. These statistics underscore the growing public health challenge posed by fatty liver disease over the past decade, emphasizing the need for effective prevention and management strategies(Younossi et al., 2020).

The prevalent increase has been linked to diverse socio-demographic factors which include age, gender, socioeconomic status, education level, occupation, lifestyle and healthcare access which has been a determinant in the development, progression and management of FLD but still remains inadequately explored, particularly in low- and middle-income countries (LMICs) (Zhou et al., 2019). Despite these prevalence, many patients remain asymptomatic for years, leading to delayed diagnosis and treatment which progresses to more severe liver conditions, such as non-alcoholic steatohepatitis (NASH), cirrhosis and hepatocellular carcinoma (Chalasani et al., 2020). Effective self-management which includes dietary modifications, regular physical activity and weight control has been identified as the basis of FLD management. However, its' adherence is often hindered by factors such as lack of knowledge, financial constraints, psychological barriers, and inadequate healthcare support contributing to delayed diagnosis and suboptimal management (Zelber-Sagi et al., 2021).

Since self-management techniques enable patients to actively participate in the management of their health condition, they are a crucial part of the therapy and control of FLD. Self-management that works can improve quality of life, lower the risk of complications, prevent or stop the progression of disease, and lessen the strain on healthcare systems. According to Chalasani et al. (2020), it entails a variety of lifestyle changes, including weight management, a balanced diet, and increased physical exercise. Dietary changes or nutritional interventions that involve a low-calorie diet are crucial for lowering liver fat and total body weight (Bellentani et al., 2020). Additionally, a balanced macronutrient intake has been associated with a decrease in liver fat content and an improvement in liver function (Yki-Järvinen, 2020). For patients with FLD, physical activities like regular exercise (Hashida et al., 2020), resistance training (Khalafi & Malandish, 2021), patient-centered counseling (West et al., 2020), stress management techniques (Van der Windt et al., 2020), and routine check-ups monitoring lipid profiles, glycemic control, and liver function tests (LFTs) are crucial (Chalasani et al., 2020).

From study carried out by Mantovani et al., (2020), it was revealed that FLD prevalence varies in relation to different socio-demographic groups. NAFLD is commonly diagnosed among individuals with obesity and metabolic syndrome resulting from socioeconomic status and lifestyle factors (Some studies revealed a higher prevalence among males while others reported an increase incidence among females especially those in the urban setting who are more exposed to sedentary lifestyles and Westernized diets (Friedman et al., 2021). Additionally, lower-income population faces greater barriers to accessing healthcare services with delayed diagnosis and poorer disease outcomes (Le et al., 2019).

The researchers observed over years of practice that there were increasingly new cases of FLD of about 10%. Meanwhile during interrogation with the patient, it was revealed that majority were ignorant of their condition and its' management hence presenting with ill health and poor prognosis with increase morbidity and mortality rate. Although, some complaint about self-management strategies as being cumbersome, thus hindering its' adoption. Of a truth, this

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huge gap in understanding and adherence highlights the need for a study which will explore the factors influencing FLD and the barriers to effective self-management in order to develop targeted public health interventions, improving early detection strategies and designing effective treatment approaches. Hence, the researcher assessed the factors associated with fatty liver disease and self-management strategies among diagnosed patients in selected teaching hospitals in Ogun State.

Hypotheses

$H_0 1$. There is no significant relationship between socio-demographic characteristics and knowledge of fatty liver disease among diagnosed patients.

$H_0 2$. There is no significant relationship between perceived severity of fatty liver disease and adherence to self-management strategies among diagnosed patients

Methodology

Research Design: A cross sectional descriptive research design was used. This research design was considered most suitable as the researcher cannot influence the independent variables as they were inherently unaltered. This design described the characteristics of the population and also helped in the understanding of various factors associated with fatty liver disease and self-management strategies among diagnosed patients in selected teaching hospital in Ogun State, Nigeria.

Population: The target population was diagnosed patients with FLD at the two (2) teaching hospitals in Ogun State. These consisted of both in-patient (those on admission) and out-patients (those attending clinic) at the two (2) hospitals between June and December 2024. All patients (18 years and above) diagnosed and managed for liver disease between June to December, 2024 that were willing to partake in the study.

Sample Size and Sampling Technique: The total enumeration from the statistics was used since the population is small. Hence the sample size is 244. Purposive sampling technique was used to select respondents that met with the set criteria for the study.

Instrumentation: A self-structured questionnaire was constructed based on objectives, literature review and theoretical framework. The instrument was used with face to face question and answer interaction to clarify and respond to the questions that was raised before filling. It consisted of itemized questions related to the objectives of the study. The instrument was divided into six (6) sections.

Knowledge of fatty liver disease: It is a thirty-nine (39) item questionnaire. The higher the scores, the greater the knowledge level on FLD. The scores were classified into three: Low knowledge: scores between 0 and 13, Moderate knowledge: 14 and 26 while High knowledge: scores between 27 and 39.

Severity of fatty liver disease: This section elicited information on severity of fatty liver disease among diagnosed patients using 10 items in 5 points likert scale format. Categorization on severity of fatty liver disease among diagnosed patients was classified into three; Mild: scores between 10 and 25, Moderate: scores between 26 and 40and Severe: scores between 41 and 60.

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Factors associated with FLD: This session elicited information on factor associated with fatty liver disease among diagnosed patients using 10 items in 5 points likert scale format

Self-management strategies: This section elicited information on self-management strategies among diagnosed patients using 12 items in 5 points likert scale format

Perceived barriers to self-management strategies: This section elicited information on perceived barriers to self-management strategies among diagnosed patients using 10 items in 5 points likert scale format.

Method of Data Collection: An introductory letter was collected from Babcock University post graduate school to the two (2) teaching hospitals in order to gain permission to conduct the study. The researcher trained two (2) research assistants (Igbo and Hausa speaking) that assisted in carrying out the study. The instrument was administered by the researcher and assistant within the period of 4 weeks. The questionnaire was self- administered by those that were educated. For those that needed assistance, clarification on any part of the questionnaire was made with detailed explanation from the researcher. The research assistants translated to non-English speaking patients and also gave them the opportunity to ask question, participants were allowed to provide their answers while the research assistant documented on the questionnaire. Questions on the instrument were answered by the respondent within an estimated period of ten (10) to ten (15) minutes. All copies were collected on the spot to prevent low return rate of the questionnaire.

Method of Data Analysis: The filled questionnaire were collected, coded and analyzed using descriptive statistics (frequency counts, percentages, tables, mean and standard deviation) while inferential statistics (Chi-square and multiple regression analysis) was employed to analyze the hypotheses generated.

Results

Table 4.1: Socio-demographic characteristics of respondents (N = 244)

SN	Variables	Frequency	Percentage (%)
1	**Age (years)**		
	<40	38	15.6
	40 – 50	52	21.3
	50 – 60	91	37.3
	> 60	63	25.8
		Mean = 50.71	Std. Dev. = 9.382
2	**Gender**		
	Male	111	45.5
	Female	133	54.5
3	**Level of Education**		
	No formal	31	12.7
	Primary	54	22.1
	Secondary	82	33.6
	Tertiary	77	31.6
4	**Religion**		

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	Christianity	96		39.3
	Islam	102		41.8
	Traditional	46		18.6
5	**Occupation**			
	Civil Servant	72		29.5
	Trader	80		32.8
	Unemployed	2	0.8	
	Farming	70		28.7
	Artisans	20		8.2
6	**Family Type**			
	Monogamy	101		41.4
	Polygamy	74		30.3
	Single parent	69		28.3
7	**Ethnicity**			
	Yoruba	106		43.4
	Igbo	47		19.3
	Hausa	91		37.3
8	**Income (#)**			
	< 70,000	121		49.6
	70,000 – 140,000	83		34.0
	> 140,000	40		16.4
9	**Diagnosis' duration**			
	< 6 months	86		35.2
	6 months – 1 year	47		19.3
	1 – 3 years	67		27.5
	> 3 years	44		18.0
10	**How they were diagnosed**			
	Routine medical checkup	116		47.5
	Incidental	52		21.3
	Management of other ailment	76		31.1
11	**Diagnosed family member**			
	Yes	94		38.5
	No	150		61.5

The demographic data of the 244 participants were presented in the above table. The age of the respondents is between 38 and 65, with a mean age of 50.71. 54.5% were females while 33.6% of the respondents had secondary education. 41.8% were Muslims who practice Islamic religion, 32.8% were traders by occupation, 41.3 % operate a monogamy type of family and 43.4% were Yoruba while 49.6% had an average monthly income of #70,000. Majority of the respondents (35.2%) were diagnosed in less than 6months ago. Although majority (47.5%) became diagnosed while carrying out routine medical examination meanwhile 38.5% already had a family member who had been diagnosed of fatty liver disease. It was deduced that despite majority being a trader with an average monthly income of less than #70,000, they still had the habit of going for routine medical checkup which made majority to be diagnosed in less than 6months. This may likely be

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an added advantage for the respondents in adopting a self-management strategy that will improve their health status.

Table 2: Factors associated with fatty liver disease among diagnosed patients

Factors associated with fatty liver disease	SA F (%)	A F (%)	D F (%)	SD F (%)	NI F (%)	Mean (X)	SD
Obesity and type-2 diabetes	120 (49.2)	82 (33.1)	16 (6.6)	-	26 (10.7)	4.11	1.23
High saturated fat and refined sugar diet	84 (34.4)	98 (40.2)	47 (19.3)	3 (1.2)	12 (4.9)	3.98	1.02
Drugs like cortisol and estrogen induces	48 (19.7)	92 (37.7)	5 (2.0)	46 (18.9)	53 (21.7)	3.30	1.49
Sedentary lifestyle contribute to FLD	39 (16.0)	89 (36.5)	56 (23.4)	27 (11.1)	33 (13.5)	3.30	1.25
Hormonal changes at menopause	130 (53.3)	16 (6.6)	43 (17.6)	21 (8.6)	34 (13.9)	3.77	1.50
Alcohol intake increases the risk of FLD	54 (22.1)	93 (38.1)	58 (23.8)	12 (4.9)	27 (11.1)	3.55	1.21
Average mean score = 3.67, Std. dev. = 1.28							

The Table 2 presented the various factors associated with fatty liver disease among diagnosed patients. Using the decision rule, all the above listed factors are associated with fatty liver disease with an average mean score of 3.67 ± 1.28. It was further observed from the table that obesity and type-2 diabetes had a mean score of 4.11 (82.2%) on a scale of 5 (100%), while consumption of high saturated fat and refined sugar diet has a mean score of 3.98 ± 1.02 (79.6%). Other factors are; hormonal changes at menopause (mean = 3.77 ± 1.50, 75.4%), alcohol intake increases the risk of FLD (mean = 3.55 ± 1.21, 71%), drugs like cortisol and estrogen induces and sedentary lifestyle contribute to FLD (mean = 3.30 ± 1.49, 66%).

Table 3: Chi-square Testing the association between socio-demographic characteristics and knowledge of fatty liver disease among diagnosed patients

SN	Socio-demographic	Knowledge Level			X2	P value
		Low	Moderate	High		
1	**Level of Education**					
	No formal	3	28	-		
	Primary	-	52	2	71.803	.000**
	Secondary	-	67	15		
	Tertiary	-	52	25		
2	**Religion**					
	Christianity	2	75	19		
	Islam	1	78	23	39.999	.000**
	Traditional	-	46	-		
3	**Occupation**					
	Civil Servant	-	60	12		
	Trader	-	70	10		

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	Unemployed	1	1	-	11.405	.461
	Farming	1	58	11		
	Artisans	1	11	8		
4	**Family Type**					
	Monogamy	2	83	16		
	Polygamy	1	59	14	9.976	.168
	Single parent	-	57	12		
5	**Ethnicity**					
	Yoruba	-	75	31		
	Igbo	-	39	8	26.345	.000
	Hausa	3	85	3		
6	**Income (#)**					
	< 70,000	2	121	15		
	70,000 – 140,000	1	83	14	30.009	.000
	> 140,000	-	40	13		
7	**Diagnosis' duration**					
	< 6 months	-	77	9		
	6 months – 1 year	1	34	12	21.087	.017
	1 – 3 years	2	52	13		
	> 3 years	-	36	8		
8	**How they were diagnosed**					
	Routine medical checkup	3	100	13		
	Incidental	-	38	14	14.004	.330
	Management of other ailment	-	61	15		
9	**Diagnosed family member**					
	Yes	-	79	15	18.876	.000**
	No	3	120	27		

Results in Table 3 that the chi-square value obtained for level of education is (x^2 = 71.803, p = .000 < .05); religion (x^2 = 39.999, p = .000 < .05); ethnicity (x^2 = 26.345, p = .000 < .05); average monthly Income (x^2 = 30.009, p = .000 < .05); duration of diagnosis (x^2 = 21.087, p = .017 < .05); and family member been diagnosed (x^2 = 18.876, p = .000 < .05) all at the significant levels of less than 0.05. Since these p-values were equal to or less than 0.05 values, it could be said that all the socio-demographic variables used in this study except occupation (x^2 = 11.405, p = .461 >.05), family type (x^2 = 9.976, p = .168 > .05), and how they were diagnosed (x^2 = 14.004, p = .330 > .05). It therefore denoted that the null hypotheses was rejected since there is a significant association between the socio- demographic characteristics and knowledge of fatty liver disease among diagnosed patient

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Table 4: Chi-square Test of relationship between perceived severity of fatty liver disease and self-management strategies among diagnosed patients

Self-management strategies	Perceived severity			X^2	P value
	Mild	Moderate	Severe		
Dietary counseling	31	163	50		
Regular physical activity	26	183	35		
Stress reduction practice	23	190	31		
Medication adherence and avoidance of OTC	19	205	20		
Quality sleep (7-8 hours)	24	173	47		
Avoiding alcohol consumption reduce fat	25	190	29	53.269	.000**
Routine Medical Check-up aid treatment	25	183	36		
Gradual weight loss reduces liver fats	17	212	15		
Monitoring and managing co-morbidities	18	200	26		
Strong support system encourages adoption	20	198	26		
Prompt education aids adoption practices	23	206	15		
Financial constraint hinders adoption	17	210	17		

The table 4 above shows that the hypothesis that stated "there is no significant relationship between perceived severity of fatty liver disease and self-management strategies among diagnosed patients" was rejected by this findings. Therefore, the alternate hypothesis of a significant relationship between perceived severity of fatty liver disease and self-management strategies among diagnosed patients ($x^2 = 53.269$, p = .000 < .05).

Discussion

The highest ranked factors identified by the respondents are obesity and type-2 diabetes, consumption of high saturated and refined sugar diet, laziness as a result of sedentary lifestyle, commoner among male gender and hormonal changes at menopause. The study is supported by Younossi et al., (2020) which revealed central or visceral obesity was seen to have significantly contributed to fat accumulation in the liver thereby increasing the risk of FLD with about 80% of obese individuals reported to have NAFLD. Hashida et al., (2020) also supported with his report that physical inactivity contributed to obesity in FLD as sedentary lifestyle is linked to insulin resistance and obesity. Conversely, regular physical activity has been shown to reduce liver fat and improve insulin sensitivity providing a protective effect against FLD (Chalasani et al., 2020).

Outcome from the first hypothesis indicated a significant association between socio-demographic characteristics (Level of Education *P*= 0.00; Religion *P*= 0.00; Ethnicity *P*= 0.00; Average monthly Income *P*= 0.00; has any family member been diagnosed *P*= 0.00 and knowledge of fatty liver disease among diagnosed patients). This implies that individual characteristics and past experience is associated to the adoption of self-management strategies. This is similar to the study by (Lonardo et al., 2020) which revealed that demographic factors such as age, sex, and ethnicity influence FLD risk and progression. The risk increases with age especially for advanced stages as the elderly are more susceptible to liver fibrosis and cirrhosis as a result of cumulative effect of metabolic conditions over time Men are more prone to AFLD due to higher rates of alcohol consumption while postmenopausal women have a heightened risk of NAFLD due to hormonal changes and shifts in fat distribution (Rich et al., 2022). Ethnically, Hispanic individuals tend to have higher rates of FLD (Anstee, et al. 2021) while African Americans have a lower prevalence possibly due to genetic and lifestyle factors (Younossi et al., 2020).

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The results of the second hypothesis indicated there is significant association between perceived severity of fatty liver disease (*p* - 0.00) and self-management strategies among diagnosed patients. This implies that the more serious their condition, the easier for them to adopt self-management strategies. This is supported by findings of Carpenter (2021) which revealed that perceived severity is directly related to the adoption of preventive behaviors in chronic illnesses i.e. diagnosed patients who believe that FLD can lead to severe outcomes are more likely to engage in effective self-management strategies. Hence, their meta-analysis result concluded that perceived severity is strongly related with the likelihood of adopting health-promoting behaviors.

Conclusion and Recommendations

The study found that among diagnosed patients in the chosen tertiary hospitals in Ogun State, self-management techniques are significantly influenced by participant socio-demographic factors, and the severity of the disease condition. With a focus on the necessity of a customized strategy that addresses individual risk factors, the study concluded that patient education and awareness are crucial for successful self-management. Additionally, the community, family, and medical professionals' support increases treatment plan acceptance and adherence, which inevitably raises overall quality of life.

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