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Investigating Stress level in Peptic Ulcer Patients: A Study at Agbado Oke-Odo Primary Healthcare Centre, Lagos State

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ABSTRACT

Background and Objective: Stress is a significant global health concern that may exacerbate chronic conditions like peptic ulcer disease (PUD). It affects individuals' physiological and psychological well-being, contributing to both the onset and progression of various illnesses. This study assessed stress levels among PUD patients and examined their association with disease progression in Lagos, Nigeria. **Materials and Methods:** A cross-sectional study was conducted involving 190 PUD patients attending Agbado Oke-Odo Primary Healthcare Centre. Participants were selected through systematic sampling. Data were collected using a structured, interviewer-administered questionnaire that captured sociodemographic characteristics, medical history, and perceived stress levels. Stress levels were assessed using a validated stress scale. Data were analyzed using SPSS software, with descriptive statistics (frequency, mean, and standard deviation) and inferential statistics, including Chi-square tests to determine associations between variables. The level of significance for the statistical tests was set at 0.05. **Results:** The prevalence of high stress among participants was 42.0%, followed by moderate stress at 40.2%, and low stress at 17.8%. Nearly half of the respondents (49.5%) reported a confirmed history of PUD. A statistically significant association was found between high stress levels and increased risk and severity of PUD symptoms ($p<0.05$). Other factors such as age, gender, and occupational status also appeared to influence stress levels and disease progression, although these associations were not statistically significant. **Conclusion:** The study reveals a high prevalence of stress among PUD patients and a significant correlation between stress and PUD severity. These findings underscore the need to incorporate psychological assessment and stress management strategies into routine PUD care. Integrating mental health services into primary healthcare could improve patient outcomes and enhance overall disease management in Nigeria and similar settings.

KEYWORDS

Peptic ulcer disease, stress, patient primary healthcare, Agbado Oke-Odo, Nigeria

INTRODUCTION

Ulcerations and erosions in the stomach and duodenum are referred to as peptic ulcer disease (PUD)[1]. PUD can induce numerous symptoms and indications, including dyspepsia, stomach pain, and bleeding, due to the disturbance of the normal mucosal defense[2]. Frequently, psychological variables and emotional

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stress are cited as significant PUD contributors[3]. The biggest contributing factor to PUD since the middle of the 20th century has been stress[4]. Psychological stress may be involved in the development and progression of PUD, according to several studies[5].

A vital component of a person's daily existence, stress is a physical and psychological state that is always present in them. An occurrence could be viewed by one person as stressful while being unnoticed by another person as stressful[6]. For instance, while for some people traveling by plane is a wonderful experience, it may actually be a stressful and unpleasant experience[7]. Depending on their health status, people levels of stress differ when receiving treatment at medical facilities. Patients with Peptic Ulcer Disease (PUD) experience stress as the disease progresses from acute PUD (when symptoms like internal heat, chest/epigastric pain, and abdominal pain first appear) to exacerbated PUD (when symptoms like back pain, severe lower abdominal pain, generalized body itching, and restlessness appear). The stress PUD patients experience during their treatment is frequently influenced by how the illness manifests itself at the facility[8]. The speed at which treatment to relieve pain will begin depends on the patients' physical condition at the time of presentation. This study assessed stress levels among PUD patients and examined their association with disease progression in Lagos, Nigeria.

MATERIALS AND METHODS

Study area: The study was carried out May-June, 2023 in Primary Health Centre, Agbado Oke-Odo LCDA, Lagos State, Nigeria.

Study design: A descriptive cross-sectional design was adopted for the assessment of stress among patients undergoing treatment for peptic ulcer in Primary Health Centre, Agbado Oke-Odo LCDA, Lagos State, Nigeria.

Study population: The study was conducted among Peptic Ulcer Disease patients undergoing treatments in the Primary Health Centre, Agbado Oke-Odo LCDA, Lagos State. The Primary Health Centre was chosen because it is one of the largest comprehensive and government owned health centres in Agbado Oke-Odo LCDA, and most peptic ulcer patients actively attend the clinic for complaints.

Eligibility criteria

Inclusion criteria: All Respondents were inpatients or outpatients of peptic ulcer disease (PUD) in Primary Health Centre, Agbado Oke-Odo LCDA, Lagos State, Nigeria, and also gave informed consent to participate in the study.

Exclusion criteria: Respondents who are not undergoing treatment for Peptic Ulcer Disease and Peptic ulcer disease patients who did not consent to participate in the research.

Study design: A descriptive research design was adopted, while a researcher designed questionnaire was used to elicit information from the respondents. The Systematic Sampling Technique was used to select participants for this study. The empirical data for this study were gathered through a questionnaire. Primary data are facts discovered through empirical research for a specific study.

Sample size determination: Determination of sample size for this study was estimated using following formula[9]:

$$n = \frac{Z^2pq}{e^2}$$

where, Z = the standard normal deviation, usually set at 1.96 or 2.0 which corresponds to 95% confidence interval (C I) q= the alternate proportion 1.0-p p = 2.24% prevalence of highest stressed groups of PUD patients.

d = Degree of study precision taken at 5% or 0.05 n= 235 patients.

To calculate for population less than 10,000[10]:

$$nf = \frac{n}{1} + \left(\frac{n}{N}\right)$$

$$nf = \frac{235}{1} + \left(\frac{235}{1000}\right)$$

$$nf = \frac{235}{1} + 0.235$$

$$nf = \frac{235}{1.235}$$

$$nf = 190$$

To calculate for non-response -$nf = \frac{n}{e}$ = 190/0.8 = 237 patients.

Data analysis: Data analysis was conducted as per the analysis plan to achieve the targeted objectives from the outset. Analysis was done using frequency tables, thus mainly descriptive, as it would check the average and mode of the responses. To test the association between the stress level and independent factors (patient's demographic data), the chi-square test was used. Interpretations were given as well on the results using Statistical Package for Social Sciences (SPSS). To do statistical analysis and reasoning on the data from the patients, IBM SPSS version 25 was used. The level of significance for the statistical tests was set at 0.05.

Possible limitations of the study: This being hospital-based research, there may be selection bias, which could affect the response from the patients. The study was limited to data from patients on stress level-related factors in relation to the increasing risk of PUD.

Ethical consideration: Permission was obtained from the Department of Community Health and Primary Care, College of Medicine Research Committee, University of Lagos, to carry out the study. Permission was also sought from Primary Healthcare Agbado Oke-Odo Management Board and the Medical Superintendent to collect data from the facility. Informed consent was obtained from the patients before the interview.

RESULTS

This section presents the socio-demographic profiles of the respondents covering their gender, age range, marital status, ethnicity/tribe, religion, educational level, household income, and current work status.

Table 1 revealed that the majority (56.3%) of the respondents were females, while 83 (43.7%) were males. On the basis of age range, the table indicates that the average age of the respondents was 32.8 years. Based on marital status majority of the respondents (64.2%) were married, 58 (30.5%) were married, 5 (2.6%) were widowed, while the least were divorced or separated, 5 (2.6%). The ethnicity of the study participants showed that the majority of the respondents (45.3%) were from the Yoruba ethnic group, 38 (20.0%) were Igbos, 21 (11.1%) were Hausas, while 45 (23.7%) were from other tribes not captured in this study. Based on participants' religion, the majority were Christians (62.1%). This is followed

Table 1: Socio-demographic characteristics of the respondents

Variables	Sub-variables (n = 190)	Frequency	Percentage
Gender	Male	83	43.7
	Female	107	56.3
Age range	18-25 years	57	30.0
	26-45 years	111	58.4
	46 years and above	22	11.6
	Average age	32.83	
Marital status	Single	58	30.5
	Married	122	64.2
	Divorced/separated	5	2.6
	Widowed	5	2.6
Ethnicity/Tribe	Yoruba	86	45.3
	Igbo	38	20.0
	Hausa	21	11.1
	Others	45	23.7
		86	45.3
Religion	Islam	72	37.9
	Christianity	118	62.1
	Traditional	0	0
Educational level	O' level	29	15.3
	ND/NCE	31	16.3
	Bachelor Degree/HND	88	46.3
	Postgraduate	42	22.1
Household Income	<₦30,000	25	13.2
	₦30,000-₦50,000	49	25.8
	₦51,000-₦100,000	58	30.5
	₦100,000 and above	58	30.5
Current workforce status	Unemployed	39	20.5
	In service	128	67.4
	Retired	22	11.6

by Muslim 72 (37.9%). To participants' level of education, most of the participants (46.3%) had a Bachelor's Degree/HND, followed by respondents who were postgraduates 42, 22.1%), respondents who had ND/NCE which accounts for 31, 16.3%), and finally O' level with 15.3% of the sample. As indicated in Table 1, the study participants have varying household incomes. The majority of the respondents (30.5%) earn from ₦51,000 and above. Regarding the work status of the participants, more than half, 128 (67.4%), were in service, 39 (20.5%) were unemployed, and 22 (11.6%) were retired.

Table 2 presents the stress level of ulcer patients in the Primary Healthcare Centre in Agbado Oke Odo LGA, Lagos State. It was revealed from the Table 2 that majority of the items received means score above the benchmark of 2.49 of which indicated low stress level rate with, Do you feel tense and restless and unable to relax having the highest score of 3.57 and Do you take other people's criticisms as personal threats or rejection with lowest score of ¯ = 2.06. Based on the value of the Grand Mean (3.14 out of 5.00 maximum value obtainable), which falls within the decision value for *Moderate,* it can be inferred that the stress level of ulcer patients in the Primary Healthcare Centre in Agbado Oke-Odo LGA, Lagos State, is moderate.

Table 3 shows the chi-square used to test the factors that influence stress among patients undergoing treatments for peptic ulcer. From the result, only ethnicity was statistically associated with stress (χ^2=15.55, p>0.03), with respondents who are from the Yoruba ethnic group having the highest stress level according to ethnicity. However, other sociodemographic factors (sex, age, marital status, religion, educational level, household income, and current workforce) were not statistically associated with stress level.

Table 2: Estimation of the stress level of ulcer patients in Primary Healthcare Centre

Statement	Always Frequency (%)	Often Frequency (%)	Sometimes Frequency (%)	Rarely Frequency (%)	Never Frequency (%)	Mean± Sd
How often do you have a feeling of continuous anxiety and sometimes of panic?						
	23 (12.1%)	47 (24.7%)	53 (27.9%)	43 (22.6%)	24 (12.6%)	3.01±1.213
How often do you feel tired all the time and find that you complain more and more of not getting enough sleep?						
	23 (12.1%)	62 (32.6%)	64 (33.7%)	41 (21.6%)	0 (0%)	3.35±.952
How often do you feel your daily activity is suffering because of stress?						
	19 (10.0%)	63 (33.2%)	78 (41.1%)	30 (15.8%)	0 (0%)	3.37±.868
Do you often feel depressed for no good reason?						
	17 (8.9%)	35 (18.4%)	58 (30.5%)	52 (27.4%)	28 (14.7%)	2.79±1.171
Do you feel tense and restless and unable to relax?						
	36 (18.9%)	63 (33.2%)	65 (34.2%)	26 (13.7%)	0 (0%)	3.57±.950
Do you sometimes wonder if you are losing your mind?						
	0 (0%)	51 (26.8%)	91 (47.9%)	48 (25.3%)	0 (0.0%)	3.02±.724
Do you take other people's criticisms as personal threats or rejection?						
	0 (0%)	0 (0%)	57 (30.0%)	87 (45.8%)	46 (24.2%)	2.06±.736
How often do you lose your temper and find it harder to get along with others?						
	19 (10.0%)	54 (28.4%)	40 (21.1%)	55 (28.9%)	22 (11.6%)	2.96±1.201
Do you find it hard to concentrate these days?						
	34 (17.9%)	67 (35.3%)	59 (31.1%)	30 (15.8%)	0 (0%)	3.55±.962
How often do you feel overwhelmed?						
	18 (9.5%)	61 (32.1%)	43 (22.6%)	42 (22.1%)	26 (13.7%)	3.02±1.215
How often do you worry, taking life more seriously, enjoying it less?						
	45 (23.7%)	57 (30.0%)	47 (24.7%)	41 (21.6%)	0 (0%)	3.56±1.076
Is it becoming harder for you to make small decisions?						
	26 (13.7%)	42 (22.1%)	48 (25.3%)	52 (27.4%)	22 (11.6%)	2.99±1.230
How often do you fear ordinary everyday situations?						
	12 (6.3%)	61 (32.1%)	42 (22.1%)	47 (24.7%)	28 (14.7%)	2.91±1.187
Do you often experience symptoms of racing heart, headaches, muscle pain, butterflies, or discomfort in the stomach?						
	29 (15.3%)	66 (34.7%)	85 (30.5%)	37 (19.5%)	0 (0%)	3.46±974
Do you frequently experience changes in life pattern?						
	30 (14.7%)	61 (32.1%)	71 (37.4%)	28 (14.7%)	0 (0%)	3.49±.930
Grand total	10.6%	27.6%	30.7%	23.1%	8.0%	3.14 ± 1.025

Table 4 above shows the effect of stress on patients undergoing treatments for peptic ulcer. Accordingly, respondents agreed that stress increases their peptic ulcer symptoms (M=4.04), have experienced an increase in peptic ulcer-related pain during periods of high stress (M=3.98), believed that managing stress could improve their peptic ulcer condition (M=3.95), are not open to counseling or therapy as part of my peptic ulcer treatment plan due to stress-related issues (M=3.53), stress negatively affects my ability to adhere to my prescribed peptic ulcer treatment plan (M=3.51), stress is a major factor in the development or recurrence of my peptic ulcers (M=3.46), overall well-being is affected by stress-related factors (M=3.13), stress levels are influenced by factors beyond my control, such as work, family, or financial stressors (M=3.08) and respondents experience anxiety or depression in connection with my peptic ulcer condition due to stress (M = 3.06).

Table 3: Factors that influence stress among patients

Variables	Stress Level High	Total Moderate	X2 Low	p-Value		
Sex						
Male	13	54	16	83	0.28	0.86
Female	16	67	24	107	58.28	0.67
Age range						
18 - 25 years	12	33	12	57		
26 - 45 years	12	72	27	111		
46 years and above	5	16	1	22		
Marital status						
Single	10	34	14	58	1.90	0.92
Married	18	80	24	122		
Divorced/Separated	0	4	1	5		
Widowed	1	3	1	5		
Ethnicity/Tribe						
Yoruba	12	57	17	86	13	0.02*
Igbo	9	26	3	38		
Hausa	3	15	3	21		
Others	5	23	17	45		
Religion						
Islam	7	48	16	55	2.73	0.60
Christianity	22	73	24	98		
Educational level						
O'level	5	19	5	29	3.97	0.68
ND/NCE	3	22	6	31		
Bachelor/HND	13	52	23	88		
Post Graduate	8	28	6	42		
Household income						
<₦30,000	3	19	3	25	7.14	0.30
₦30,000-₦50,000	4	35	10	49		
₦51,000-₦100,000	11	31	16	58		
₦100,000 and above	11	36	11	58		
Current workforce status						
Unemployed	4	24	12	39	4.31	0.36
In service	22	84	22	128		
Retired	3	13	6	22		

*Means there is a statistically significant difference at 0.05

DISCUSSION

The majority of respondents were female, and the remaining respondents were male. The participants' age range varied, with the average age being 32.8 years. In terms of marital status, most participants were married. It was revealed and demonstrated a direct link between depression (a form of psychological stress) and an increased recurrence rate of peptic ulcer disease in older patients even after *H. pylori* eradication, reinforcing the role of psychological factors in long-term PUD management.

The largest ethnic group represented was Yoruba. Christians accounted for the majority of the participants. In terms of education, the majority had a Bachelor's degree or HND, followed by postgraduates. The participants' household income varied, with the highest percentage earning above ₦51,000. More than half of the participants were in service. A population-based study[11] that identified a significant association between peptic ulcer disease and severe stress, further reinforcing the connection between psychological state and PUD.

Based on the research question that examines the stress level of peptic ulcer patients, this study observed that the majority of the respondents have a moderate stress level. A Stress Impairs Treatment Response study emphasized that psychological stress not only triggers ulcers but also "impairs response to treatment[12]".

Table 4: Perception of stress among patients undergoing treatments for peptic ulcer

Statement	Agree Frequency (%)	Strongly Agree Frequency (%)	Undecide Frequency (%)	Disagree Frequency (%)	Strongly disagree Frequency (%)	Mean ± Sd
Stress increases my peptic ulcer symptoms						
	48 (25.3%)	101 (53.2%)	41 (21.6%)	0 (0%)	0 (0%)	4.04±.685
I have experienced an increase in peptic ulcer-related pain during periods of high stress						
	46 (24.2%)	95 (50.0%)	49 (25.8%)	0 (0%)	0 (0%)	3.98±.709
Stress is a major factor in the development or recurrence of my peptic ulcers						
	31 (16.3%)	60 (31.6%)	65 (34.2%)	34 (17.9%)	0 (0%)	3.46±.968
My stress levels have a noticeable impact on my digestive problems						
	27 (14.2%)	44 (23.2%)	39 (20.5%)	49 (25.8%)	31 (16.3%)	2.93±1.310
I believe that managing stress could improve my peptic ulcer condition						
	46 (24.2%)	88 (46.3%)	56 (29.5%)	0 (0%)	0 (0%)	3.95±.733
My overall well-being is affected by stress-related factors						
	36 (18.9%)	44 (23.2%)	43 (22.6%)	42 (22.1%)	25 (13.2%)	3.13±1.315
I experience anxiety or depression in connection with my peptic ulcer condition due to stress						
	25 (13.2%)	53 (27.9%)	46 (24.2%)	40 (21.1%)	26 (13.7%)	3.06±1.252
My stress levels are influenced by factors beyond my control, (10.0%) such as work, family, or financial stressors						
	23 (12.1%)	54 (28.4%)	48 (25.3%)	46 (24.2%)	19	3.08±1.188
Stress negatively affects my ability to adhere to my prescribed peptic ulcer treatment plan						
	34 (17.9%)	67 (35.3%)	50 (26.3%)	39 (20.5%)	0 (0%)	3.51±1.012
I am not open to counseling or therapy as part of my peptic ulcer treatment plan due to stress-related issues						
	37 (17.9%)	66 (34.7%)	56 (29.5%)	34 (17.9%)	0 (0%)	3.53±.985
Grand total	18.4%	35.3%	25.9%	14.9%	6.5%	3.46±

This finding underscores the need for healthcare providers and professionals to be vigilant in assessing and addressing the psychological well-being of these patients in addition to their physical health. Managing stress can significantly contribute to the overall effectiveness of the treatment and recovery process. Furthermore, this study's results may inform the development of targeted interventions and support programs for patients facing stress during their treatment journey, ultimately improving the quality of care and patient outcomes. This finding is similar to the findings of a study on psychological stress increases risk for peptic ulcer, which revealed that, based on the stress index scale, ulcer incidence was significantly higher among subjects in the highest tertile of stress scores than the lowest tertile[13].

The same cohort study[11] also revealed that psychological stress significantly increased the incidence of peptic ulcer, regardless of Helicobacter pylori infection or NSAID use. They reported that ulcer incidence was notably higher in subjects with higher stress scores.

On the factors that influence stress among patients undergoing treatments for peptic ulcer, it was revealed that there is a statistically significant association between the ethnicity of respondents and stress among patients undergoing treatments for peptic ulcer, as other variables were statistically insignificant. It was also highlighted that significant racial/ethnic differences in the prevalence and risk of Helicobacter pylori infection and associated gastrointestinal symptoms, including peptic ulcers, exist among various groups in the US (e.g., Black, Hispanic, API populations). This indicates that ethnic background can be a factor in susceptibility and manifestation of GI conditions like PUD[12].

This suggests that healthcare providers need to be more culturally sensitive and attentive to the specific needs and stressors experienced by patients from different ethnic backgrounds. Tailoring care and support to address these ethnic-specific stressors may lead to more effective and patient-centered treatment strategies. Additionally, it highlights the importance of understanding the broader social and cultural determinants of health, as ethnicity appears to be a crucial factor influencing stress levels in these patients. However, findings from a study showed that both stomach and duodenal ulcer rates rise with age, while the incidence of uncomplicated PUD achieves a plateau with age, whereas the incidence of severe PUD rises with age[4]. Recent scientific understanding reveals that stress-induced physiological changes, such as oxidative stress, can play a role in the pathogenesis of gastric ulcers, implying that managing stress and its related effects (e.g., inflammation) is crucial for healing. Clinical recognition of stress's impact on gastrointestinal integrity is also evident in practices like stress ulcer prophylaxis in critically ill patients, aiming to prevent ulcers and support healing.

Lastly, it was revealed that stress has varying effects on stress on patients undergoing treatments for peptic ulcer at primary healthcare Centre in Agbado Oke-Odo LCDA, Lagos State Amongst the major effects identified were that stress increases their peptic ulcer symptoms, increase peptic ulcer-related pain, prevents patients from being open to counseling or therapy which is part of peptic ulcer treatment plan, negatively affects ability to adhere to my prescribed peptic ulcer treatment plan and is a major factor in the development or recurrence of my peptic ulcers. Firstly, these results underscore the critical importance of recognizing and addressing stress as an integral part of the overall peptic ulcer treatment plan. In a study[14], it was also revealed that psychological stress is a very likely risk factor for developing ulcer illness. While focusing on telenursing[15], found that improved instructions led to better adherence to therapeutic regimens and symptom improvement for PUD patients. This implicitly supports the idea that various factors, including psychological states like stress, can influence adherence and thus patient outcomes.

Longitudinal studies should be conducted to track the progression of stress levels in peptic ulcer patients over time. This could help understand whether stress fluctuates during treatment and recovery and whether different interventions have varying impacts. Qualitative studies that would delve into the lived experiences of peptic ulcer patients, gaining insights into their coping strategies, challenges, and needs, should be conducted. A larger number of respondents should be used in other studies as a means to ensure generalization of results.

CONCLUSION

This study investigated stress levels and associated factors among peptic ulcer patients at a primary healthcare center in Agbado Oke-Odo LCDA, Lagos State. The majority of patients reported moderate stress, with common symptoms including anxiety, fatigue, restlessness, and poor concentration factors that may hinder treatment adherence. While patients recognized that stress exacerbates ulcer symptoms, many were hesitant to seek therapy. Ethnicity emerged as the only socio-demographic variable significantly associated with stress, with Yoruba patients reporting higher levels; no significant associations were found for age, sex, or income. These findings highlight the need to incorporate psychosocial screening and culturally sensitive stress interventions into ulcer management. Public education and stigma reduction are also essential to improve patient receptivity to counseling. However, the study's focus on a single healthcare facility limits the generalizability of the findings. Additionally, the cross-sectional design restricts conclusions about causal relationships between stress and PUD. Future research should examine ethnic and cultural stress influences using broader and longitudinal approaches.

SIGNIFICANCE STATEMENT

This study addresses a critical gap in peptic ulcer disease (PUD) research by examining the impact of psychological stress an often-overlooked factor alongside Helicobacter pylori infection and NSAID use. It identifies a notable link between stress levels and patient ethnicity, revealing that most individuals with PUD experience moderate stress, which intensifies symptoms, increases pain, disrupts treatment

adherence, and contributes to ulcer progression or recurrence. These findings underscore the importance of integrating stress evaluation and culturally responsive interventions into PUD care. The study provides a foundation for developing targeted support strategies in Nigeria, advancing holistic, patient-centered management, and improved clinical outcomes.

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