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Adherence and health related quality of life of ulcer patients in Bayelsa state

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Abstract
Peptic and duodenal ulcer diseases are frequently occurring and recurrent gastrointestinal diseases in the world and are usually recurrent, with increasing annual incidence rates. Treatment options are complex, with reported usual nonadherence and probable impairment of quality of life. A cross sectional study was carried out to assess the medication adherence and HRQOL of all ulcer patient who visit the outpatient department of Diete Koko Memorial Hospital, Bayelsa State from January to October 2022, using the MINICHAL and an adapted MMAS-8 scales. The study revealed the participation of more of single females aged between 20 and 40 in rural areas having post-secondary education, with reported income levels below N30, 000.00 monthly. The study also revealed that most of the respondents had their ulcer status diagnosed for more than 4 years before the commencement of this study. Low adherence (3.67) and fair HRQOL (18.9) to peptic and duodenal ulcer therapy was reported. Marital status was not revealed as significant factor of adherence to ulcer treatment but for the HRQOL. Age, education, residence, employment, occupation, income level, and time of diagnosis were reported to be significant predictors of adherence to and HRQOL of peptic and duodenal ulcer medications. Education on treatment of peptic and duodenal ulcer as a means of improving adherence is recommended. The need to investigate in more detail the reasons for poor adherence of use of ulcer medication is urgently recommended.

Keywords: Peptic ulcer disease, duodenal ulcer disease, adherence, health related quality of life

Introduction
Ulcer is a sore on the inner lining of the stomach or duodenum (National Institute of Diabetes and Digestive and kidney Diseases, 2014) brought about by the action of stomach acids that digest the mucosal lining of the gastro-intestinal tract itself (Stephen, Seeley and Tate, 2006) [36]. Ulcers are classified on the basis of location (gastric and duodenal) and severity (acute and chronic) (Rakesh, *et al*, 2010; Richard, 1990) [17, 25]. The most common symptom is that of a dull or burning pain in the stomach anywhere between the navel and the breastbone occurring on empty stomach or at night. Other symptoms are epigastria pain, abdominal discomfort, nausea, blood stool in severe cases, weight loss, changes in appetite and vomiting (Okereke, 2006) [26]. This disease condition is reported to be predisposed mostly by long use of higher doses of NSAIDs (Malchow 1987) [32], diet, stress, smoking habits, consumption of concentrated alcohol (>10%) (RakeshVipin &Kanchan, 2010) [17], coffee drinking and familial occurrences of ulcers in patients with gastric or duodenal ulcer (Vipin, 2010) [17]. Anemia (Miyake Kusunoki, Ueki, Nagoya & Kodaka, 2013) [16], upper GI bleeding (Boonpongmanee & Fleischer, 2004) [27], gastric outlet obstruction (Passaro *et al*, 2009) [29] and intestinal perforation (Malfertheiner & Chan, 2009) [28] are reported complications. Common means of management are by the use of antacids to neutralize gastric acid and reduce pepsin activity (Helms & Herfindal, 2006) [13], proton pump inhibitor to suppress gastric acid secretion and inhibit gastric H^+K^+-ATPase enzyme (proton pump) (Helms & Herfindal, 2006) [13], and H_2 receptor antagonists to suppress gastrin stimulated acid secretion and proportionate reduction in gastric juice volume (Malfertheiner & Chan, 2009) [28].
Treatment choices include standard triple therapy, with a likelihood of increased treatment complexities and a high level of non-compliance and resistance (Naderi *et al*., 2012) [30], resulting in reasons why many patients with a serious ulcer not benefit from otherwise effective medicines.

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Proper patient counseling has been reported to reduce noncompliance issues (Aleena, *et al*, 2020) [1]. Ensuring that patients do adhere, that is, follow the instructions of their physician in both processes of initiation, implementation, and the discontinuation of ulcer medications have been reported to be difficult (Barkun *et al*, 2010) [5], and as such had a consequent reported significantly lower Quality of Life (QOL) among this population than the general population (Aleena, *et al*, 2020) [1]. According to Sony *et al*, 2016 [21], forgetfulness was the reason for missing dose in a majority (80%) of the non-adherent patients. Other reasons according to the author were absence of symptomatic relief, gender, age, literacy, concern about the side effect, beliefs, decision not to take medication as instructed base on the perception and the prescribed treatment regimen. This directly results in relatively low health related quality of life with these patients (Silva & Moreira, 2011) [20].

An annual incidence rate of 1.1–3.3% and prevalence of 1.7–4.7% with a possibility of about 10% of people suffering from this disease during their lifetime has been reported also (Baghianimoghadam & Mohamadi, 2011) [3]. Approximately 500,000 persons develop peptic ulcer disease in the United States each year (University of Michigan Health System, 2007). In Nigeria, about 500,000 cases reported each year, on prospective observation 70% of the patient aged 18-80years are tenfold high risk of peptic and duodenal ulcer (Susan, 2006; Aleena, 2020) [33, 1].

Several scholarly works have been carried out on peptic and duodenal ulcer in the study environment. Some of such works reported on the risk factors, clinical presentations and treatment () whereas others reported on the patterns of prevalence, life-style risk factors and correlates of management (Eniojukan *et al*., 2017) [10]. The work of …… from 2012 to 2017 in NDUTH Okolobiri of Bayelsa state, reported use of NSAIDs (30%), alcohol consumption (70%), and abdominal massage (90%) as risk factors, severe abdominal pain as the most common clinical presentation, and 40% mortality rate within the age brackets of 41 to 50.

The work of Eniojukan *et al*, 2017 [10] evaluated the patterns of prevalence, life-style risk factors and correlates of management of PUD among Staff and Students of Delta State University, Abraka Campus, Nigeria, reported a 1.5:1 ratio of DU to GU with the greatest life-style risk factors as NSAIDs, Tobacco and Alcohol. No much direct work has been done to report the adherence and HRQOL of peptic and duodenal ulcer in the study environment. Assessment of the level of adherence to ulcer treatment, health related quality of life of ulcer patients and the effect of sociodemographic factors on adherence and HRQOL of ulcer patients attending Diete Koko Memorial Hospital, Bayelsa State was carried to provide needed information.

Method
Design/population
With the use of non-probablistic sampling technique, cross-sectional research was conducted 400 patients presenting with peptic or duodenal ulcer within the age brackets of 15 and 80 and who has been attending the outpatient department (OPD) in Diete Koko Memorial Hospital, Bayelsa State, from January 2022 to October 2022.

Inclusion/exclusion
All patients having established ulcer of any cause or origin either on treatment or not within the age of 15 and 80 years were included in the study. Patients who had suffered from ulcer before but were well treated and have not experienced the symptoms of ulcer for at least three months preceding the time of the study, and those outside the stipulated age brackets were excluded from the study.

Instrumentation
The Morisky Medication Adherence Scale-8(MMAS-8) (Morisky *et al*, 2008) [31] and the Minicha lBrasil (Schulz, Rossignoli, Correr, Fernandez-Limos, Toni, 2008) [32] were slightly adapted and pretested and were used to assess adherence to anti-ulcer drugs and health related quality of life of ulcer patients, respectively. Chronbach's alpha of 0.76 and 0.72 were observed for adapted MMAS-8 and MINICHAL instruments, repectively during the pretests. These instruments have been validated in another research work (Okello, Nasasira, Muiru, Muyingo, 2016 [34]. The MMAS-8 is a eight item instrument, having items 1 through 7 with response choices of 'yes' or 'no'; and item 8 has a 5-point likert scale response choice. In this instrument, total scores may range from 0 to 8 and could be categorized into 3 levels of adherence-high (score 8), medium (score 6 to <8), and low (score <6). Adherence is score 8, any result < 8 is Non adherence. The MINICHAL instrument, in its' original form consists of two domains-mental (nine items) and somatic (seven items). The mental domain includes questions 1-9 and scores range from 0-27 points and the somatic domain includes questions 10-16 and scores range from 0-21points. The last question is related to the overall impact of the disease state on the QOL. Here, total points range from 0(best level of Health) to 51(worst level of Health). The score scale is likert scale with four possible answers (0=No, not at all; 1=Yes, somewhat; 2= Yes, a lot; 3= Yes, very much).

Data collection
Permission was sought from medical personnel in charge (HOD) and verbal consent of participants (ulcer patients) were sought in Diete Koki Memorial Hospital before conducting this study. Upon meeting with a participant at their clinic day, the essence of the study was explained and the instrument administered. It was usually made sure that the participants fill out the instrument and was retrieved immediately.

Data analysis
The data from the MMAS-8 were analyzed as prescribed (Oleiveira Filho, Baretto Filho, Neves, De Lyra (2012); Okello, Nasasir, Muiru, Muyingo (2016) [35, 34]. The prescription followed was that of the following.
- Rating 'no' as '1' and 'yes' as '0' for item 1-7 and 1,0.25,0.75,0.75 and 0 for the 5-point likert responses in item 8 from left to right.
- Calculating and, summing up of individual scores and using the mean value as adherence level for all respondents.

The data from the MINICHAL (Mini Cuestionario de Calidad de Vida enHipertension Arterial), were analyzed as prescribed by Schulz, Rossignoli, Correr, Fernandez-Limos, Toni, 2008) [32].
- Rating of the scores 4-poit likert scale from 0 to 3 from left to right

- Calculating and summing up individual scores and taking the mean value obtained as HRQOL level for all respondents.

Results
Sociodemographic Characteristics of Ulcer Patients
The study revealed that 70% of the participants were aged between the ages of 20-40, females (58%) residents in rural areas (79%). 57% of the respondents were said to be single with post-secondary education (74%), self-employed (52%) and are also civil servants (36%) with reported income levels below 30kmonthly salaries (38%). The study revealed that 92% of the respondents had their ulcer status diagnosed for more than 4 years before the study. This is as shown in table 1 below.

Table 1: Sociodemographic Characteristics Of ulcer Patients In Bayelsa State, Nigeria (N=300)

Item	Response pattern	Freq. (%)
Age in years	20-40	210 (70%)
	41-60	90 (30%)
	above 61	0 (0%)
Gender	Male	126 (42%)
	Female	174 (58%)
Residence	Urban	63 (21%)
	Rural	237 (79%)
Marital status	Single	171 (57%)
	Married	129 (43%)
Education	FSLC	15 (5%)
	SSLC	63 (21%)
	ND/HND/BSC	222 (74%)
Employment	Unemployed	63 (21%)
	Self employed	156 (52%)
	Employed	81 (27%)
Occupation	Civil	108 (36%)
	Farming	63 (21%)
	Military	42 (14%)
	Others	87 (29%)
Income	below 30k	114 (38%)
	60-90k	72 (24%)
	91-120k	60 (20%)
	121-180k	42 (14%)
	above 181k	12 (4%)
Time of diagnosis	a year ago	69 (23%)
	2-3 years ago	69 (23%)
	3-4 years ago	66 (22%)
	4-5 years ago	72 (24%)
	> 5 years ago	24 (8%)

Adherence of ulcer Patients
3.67 level of adherence to ulcer therapy was reported from the study using the eight-item Modified Medication Adherence Scale (MMAS-8). In this scale Adherence ranges from worst adherence (0) to best adherence (8), and interpreted as High (score 8), medium (score 6 to <8), and low (score <6). This was exhibited in all the individual components of the study items such as the tendency to forget or not taking ulcer medications, stopping or forgetting to take medications during travels, stopping to take medications when feeling better, feeling distressed for strictly following ulcer treatment, and having difficulty remembering to taking all medications. This is as shown in table 2 below.

Table 2: Adherence Of ulcer Patients in Bayelsa State, Nigeria (N=300)

S/N	Item	Resp pattern	Resp/ADH
1	Do you sometimes forget to take your anti-ulcer medications?	No	138
2	In the last two weeks was there any day when you did not take your anti-ulcer medication/s?	No	72
3	Have you ever stopped taking your anti-ulcer medication/s or decreased (take less of) the dose without first warning (telling) your doctor because you felt worse when you took them?	No	162
4	When you travel or leave the house, do you sometimes forget to take your anti-ulcer medication/s?	No	114
5	Did you forget to take your anti-ulcer medication/s yesterday?	No	144
6	When you feel your ulcer is controlled, do you sometimes stop taking your anti-ulcer medication/s?	No	120
7	Have you felt distressed (worried) for strictly following your anti-ulcer treatment?	No	159
8	How often do you have difficulty to remember taking all your anti-ulcer medication?	Never 1	24
		Almost never 0.25	18(1.5)
		Sometimes 0.75	150(37.5)
		Frequently 0.75	69(17.25)
		Always 0	39(0)

	MMAS1-7		3.03
	MMAS 8		0.64
	ADHERENCE		3.67
High (score 8), medium (score 6 to <8), low(score <6)			

HRQOL of Ulcer Patients

18.9 HRQOL score was revealed in the study from the adapted MINICHAL instrument used. In this scale, HRQOL ranges from best HRQOL (0) to worst HRQOL (51). This quality of life expression was from the reports of participants from their physical and emotional functioning states as contained in the study instrument. This is as contained in table 3 below

Table 3: HRQOL of ulcer Patients in Bayelsa State, Nigeria (N=300)

S/N	Item	Not at all 0	Yes 1	Somewhat yes 2	A lot 3
1	Have you been sleeping poorly?	48	84	129	39
2	Have you had difficulty maintaining your usual social relationships?	126	66	99	9
3	Have you had difficulty interacting with other people?	126	90	66	18
4	Have you felt that you are not playing a useful role in life?	159	39	72	30
5	Have you felt unable to make decisions and start new things/projects?	162	42	66	30
6	Have you felt continuously distressed And tense?	60	99	120	21
7	Have you felt that life is a constant struggle?	141	102	42	15
8	Have you felt incapable of enjoying your daily activities?	78	150	54	18
9	Have you felt worn- out and powerless?	114	81	66	39
10	Have you felt sick?	66	87	117	30
11	Have you had chest pain for no apparent reason?	84	90	69	57
12	Have you been having heart burn	126	63	84	27
13	Have you noticed that you are constipating more frequently?	114	99	63	24
14	Do you have more severe headache recently?	111	48	117	24
15	Have you felt nauseated recently?	96	93	81	30
16	Have you noticed diarrhea recently?	129	87	51	33
17	Would you say that your ulcer and its treatment have affected your quality of life?	78	81	78	63
	Total of unfactored responses	1818	1401	1374	507
	Total of factored responses	0	1401	2748	1521
	Calculated hrqol per response	0	0.276	0.5394	0.298
	Total calculated hrqol	0	4.67	9.16	5.07
		18.9			
Best HRQOL (0) to worst HRQOL (51)					

Effect of Sociodemographic Factors on Adherence of Ulcer Patients

Several sociodemographic factors were revealed to contribute to the level of adherence in this study. Marital status was not revealed as significant factor of ulcer treatment. Age, education, residence, employment, occupation, income level, and time of diagnosis were reported to be great and significant predictors of adherence to ulcer medications in this study. The responses in the above factors show some significant differences in patterns than to be brought to existence by chance. This is contained table 4 below.

Table 4: Effect of Sociodemographic Factors on Adherence Of Ulcer Patients In Bayelsa State, Nigeria (N=300)

Item	Response Pattern	Adherence value	Pearson Chi-Square test of effect in sig. values							
			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Age in years	20-40	2.5	.726	.540	.003·	.281	.256	.078·	.038·	.597
	41-60	1.1								
Gender	Male	1.7	.135	.970	.782	.413	.050	.497·	.020·	.818
	Female	2								
Residence	Urban	0.9	.867	.581	.745	.127	.969	.003·	.449·	.026·
	Rural	2.8								
Marital status	Single	2.2	.506·	.506·	.506·	.130·	.550·	.248·	.484·	.382·
	Married	1.5								
Education	FSLC	0.2	.788	.061	.205	.002·	.084	.414·	.130·	.134·
	SSLC	0.8								
	ND/HND/BSC	2.7								
Employment	Unemployed	0.7	.832·	.361·	.739·	.623·	.398·	.000·	.083·	.018·
	self employed	2								
	Employed	1								
Occupation	Civil	1.5	.262	.745	.011	.175	.004	.708·	.194·	.000·
	Farming	0.7								
	Military	0.4								
	Others	1.1								
Income	below 30k	1.5	.886	.126·	.647	.339	.777	.768·	.650·	.001·
	60-90k	0.8								

	91-120k	0.8								
	121-180k	0.5								
	above 181k	0.1								
Time of diagnosis	a year ago	0.8	.342	.054	.712	.000·	.512	.017·	.058·	.006·
	2-3 years ago	1.1								
	3-4 years ago	0.7								
	4-5 years ago	0.8								
	> 5 years ago	0.3								

Effect of Sociodemographic Factors on HRQOL Of Ulcer Patients

Significant effect of sociodemographic factors on HRQOL of ulcer patients was reported. The sociodemographic factors included in this study were found to be strong predictors of the health related quality of life of hypertensive patients. Table 5contains expressions of the content of the several factors included in this study.

Table 5: Effect of Sociodemographic Factors on HRQOL of Ulcer Patients in Bayelsa State, Nigeria (N=300)

Item	Response pattern	HRQOL values	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17
Age in years	20-40	13	.017	.000	.000	.368	.373	.109	.003	.894	.000	.001	.011	.409	.175	.219	.154	.016	.044
	41-60	6.1																	
	> 61	0																	
Gender	Male	8.1	.009	.513	.025	.202	.348	.337	.257	.172	.003	.000	.000	.060	.002	.032	.383	.455	.018
	Female	11																	
Residence	Urban	3.5	.000·	.255·	.182	.441·	.349	.496·	.139	.001	.766	.203	.000	.218	.667·	.668	.888	.186	.123
	Rural	15																	
Marital status	Single	10	.883	.001·	.000·	.172·	.678	.383	.001	.073	.001	.156	.152	.000·	.037·	.182·	.086	.003·	.011
	Married	8.9																	
Education	FSLC	1	.000·	.001·	.312	.005·	.042	.131·	.739	.159·	.007	.006	.046	.000·	.656·	.621	.549·	.013·	.072
	SSLC																		
	BSC	14																	
	MSC																		
Employment	Non	4.4	.041	.014·	.002·	.025	.033	.046·	.010·	.001·	.000	.192	.071	.027	.406·	.049	.655·	.029·	.001
	Self																		
	Employ	5.1																	
Occupation	Civil		.062	.032·	.021·	.382·	.011	.013·	.000·	.083·	.025	.000	.005	.720	.022·	.719	.018·	.083·	.001
	Farming	4																	
	Military	2.9																	
	Others	4.4																	
Income	< 30k	6.9	.149·	.851·	.367·	.017·	.388·	.048·	.074·	.126·	.025·	.000	.025·	.054·	.036·	.001·	.001·	.802·	.076
	60-90k	5.1																	
	91-120k	3.2																	
	121-180k	2.8																	
	> 181k	0.7																	
Time of diagnosis in years	1	3.6	.000·	.021·	.000·	.033·	.032·	.315·	.000·	.028·	.004·	.088·	.000·	.010·	.020·	.248·	.000·	.007·	.099
	2-3	3.9																	
	3-4	4.8																	
	4-5	5																	
	> 5	1.5																	

Discussion of Findings

The study revealed a low adherence to therapy but a fair health related quality of life of ulcer patients. This reported low adherence might be connected to the poor health seeking habit among the patients. Marital status, age, education, residence, employment, occupation, income level, and time of diagnosis were reported to be great and significant predictors of adherence and quality of life to ulcer patients. This is so as those with better income or higher income health care seeking habit is better compared to those are non-workers with low income (Aleena, *et al*, 2020, Naderi *et al*., 2012, Rakesh, *et al*, 2010; Richard, 1990) [1, 30, 17, 25]

Findings from the literature were similar to the study results. A natural poor HRQOL was predicted by Barkun & Leontiadis, 2010 [6] due to the resultant gastrointestinal symptoms such as pain, nausea, anorexia and some limitations to social and metal health. It is also said that among patients with ulcer, non-adherence to medications is highly prevalent (Naderi *et al*., 2012) [30]. This might be connected to the above related reason and poor knowledge of medicine use with procurement of medicine from nonprofessional. Several studies showed that patients with PUD had significantly lower Quality of Life (QOL) than the general population and the improvement in (QOL) plays an important role in the treatment of the disease (Aleena, *et al*, 2020 Vipin, *et al*., 2010. Kodaka, *et al*., 2013) [1, 17, 16],

This is not widely reported as this area of study is not too common compared to general adherence of medication studies. Specifically, an author had identified forgetfulness as a reason for missing dose in a majority 80% of the non-adherent patients, absence of symptomatic relief, gender, age, literacy, concern about the side effect, beliefs, decision not to take medication as instructed base on the perception and the prescribed treatment regimen as reasons of poor HRQOL of ulcer patient (Sony *et al*, 2016) [21]. This is more

common with the elderly due to loss of memory and with few causes of forgetfulness of medication due to poor health seeking behavior as earlier related above. Furthermore, poor adherence is connected to poor medicine use information provided by the healthcare professional. Also, the source of drug procurement by said patient might be another contributing factor of this study reported poor adherence to ulcer medications (Stephen, Seeley and Tate, 2006) [36].

Conclusion
The study concluded that ulcer patients in Bayelsa state have low adherence patterns and suboptimal quality of life, with concomitant adverse contributions from marital status, age, education, residence, employment, occupation, income level, and time of diagnosis. The study also reported this poor health seeking behavior is due to several factors which required further investigation.

Recommendation
The study author recommends that standardized educational interventions be carried out by concerned health bodies in making campaigns for improving adherence to ulcer treatments in a bid to achieving better health related quality of life. The researcher has recommended the repeat of this scholarly work on fuller scale to ascertain the level of adherence and health related quality of life of ulcer patients in Bayelsa state and Nigeria in general.

Limitations of the Study
Time and finance were really limitations of the study, but the researcher puts on her best to ensure that a quality work was achieved.

Contribution to Knowledge
The researcher has reported a low adherence and suboptimal health related quality of life of ulcer patients in Bayelsa state of Nigeria.

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