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Prevalence and Severity of Dyspepsia with its Impact on the Quality of Life among Medical Outpatients in a Tertiary Hospital

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Abstract *Dyspepsia is a constellation of symptoms in which epigastric pain is the main presentation with a global prevalence of 7% to 45%.The aim of this study was to determine the prevalence and severity of dyspepsia and its effect on the quality of life among medical out-patients at the 34-military hospital. A systematic sampling was conducted to recruit 401 patients; a standard questionnaire used to collect information on patients' socio-demographic, clinical details, and risk factors of dyspepsia. A Short-form of the Leeds Dyspepsia Questionnaire (SF-LDQ) was used to assess symptoms and severity of dyspepsia. The Short Form Nepean Dyspepsia Index (SF-NDI) was used to assess the impact of dyspepsia on participants' quality of life. The prevalence of dyspepsia among medical outpatients at the 34 Military Hospital using the Leeds Dyspepsia Questionnaire SF-LDQ was 266(66.3%). Among patients with dyspepsia, 119(44.7%) had severe dyspepsia, 103(38.7%) had moderate dyspepsia, 42(15.8%) had mild dyspepsia, and 2(0.8%) very mild dyspepsia. In multiple linear regression models, dyspepsia as well as dyspepsia severity were significantly associated with patients' low quality of life QoL($P<0.001$).This study revealed a high burden of dyspepsia among medical outpatients as well as an association between dyspepsia, dyspepsia severity and patient QoL. We recommend screening for dyspepsia as well as widening the scope of investigation among a larger patients' population.*

Keywords *Dyspepsia, Quality of Life, Risk Factors, Severity.*

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Introduction

Dyspepsia which originates from a Greek word (Greek "dys" [bad], "pepsis" [digestion]) is used for a collection of symptoms localized by the patient to the epigastric region and the flanks. The symptoms are usually epigastric pain and burning (60 to 70%), bloating post meals (80%), early satiety (60 to 70%), upper abdominal (80%), nausea (60%), and vomiting (40%) [1].

There is a wide etiological spectrum of dyspepsia including functional dyspepsia, gastritis, gastric ulcer, gastric cancer, duodenitis, duodenal ulcer, duodenal cancer and gastro-duodenal polyps [2].

Globally the prevalence of dyspepsia varies from 7% to 45% and this may be due to geographical location as well as the definition criteria used [3]. Dyspeptic accounts for 2% to 5% of outpatient visits in primary care facilities and 20% to 40% of gastroenterology consultations [4]. Dyspepsia is much less in high income countries (10%) than low-and middle-income countries (37.9%) [5].

Dyspepsia can cause disturbances with sleep, employment, physical and social activities as well as consumption of regular meals and drinks. Consequently, dyspepsia is linked to significant impairment of health-related quality of life. Potential complications of organic dyspepsia (peptic ulcer disease, gastritis and esophagitis) can include upper GI bleeding, perforation, strictures and malignant transformation (gastric cancer) [6].

Established risk factors for dyspepsia include Helicobacter Pylori infection, non-steroidal anti-inflammatory drugs (NSAID) use, low socioeconomic status, excessive alcohol use, smoking, and female sex [7, 8].

Anecdotal evidences in urban sub-Saharan Africa reported that about 33% of patients presenting with dyspepsia have a history of long term NSAID use, and dyspepsia in the setting of NSAID use is associated with higher risk for peptic ulcer disease (PUD) [8]. Among other risk factors for dyspepsia, psychiatric disorders such as anxiety and depression have been implicated – with about 38% of dyspepsia patients having anxiety disorders, while depression was found in 16% [9].

In Sierra Leone, many clinicians believe that there is widespread use of over the counter (OTC) medications such as NSAIDS which is a major risk factor for dyspepsia and therefore bringing this out in a research work will provide patients the necessary information for prevention.

Dyspepsia poses a significant burden on health care budgets globally ranging from expensive investigations such as upper GI endoscopy to long term acid suppression medications. It also affects the work force productivity due to frequent days off by patients with dyspepsia. It affects individual's quality of life due to problems with sleep, social and physical activities as well as their eating patterns.

Dyspepsia accounts for a significant percentage of medical out-patient consultations as well as a very huge proportion of a gastroenterology clinic.

Currently there are no published data on the prevalence, severity as well as risk factors of dyspepsia in the Sierra Leonean population. This study was done to determine dyspepsia prevalence, severity and its impact on quality of life among medical out-patients in a tertiary hospital in Sierra Leone.

Methods

Study Design

This was an observational cross-sectional study on the prevalence and severity of dyspepsia with its effect on quality of life among medical out-patients at the 34 Military hospital – a tertiary hospital in Sierra Leone.

Study Population

All medical outpatients at the 34 Military Hospital and who gave consent were included in the study.

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Exclusion Criteria

Patients less than < 18 years as well as those patients who were unable to respond to the questionnaires were excluded from the study.

Patients with advanced comorbidity such as end-stage kidney disease on dialysis, Stroke patients with aphasia and/or decompensated heart failure patients with breathlessness were not included in the study.

Sample Size

$$N = \frac{Z^2 Pq}{d^2}$$

where N is the minimum required sample size; Z is the standard normal deviate corresponding to a 95% confidence level (Z = 1.96); P is the prevalence taken from a similar study done in Rwanda by Bitwayiki et al., who reported a prevalence rate of 38.9% [10]; q = 1 - P; and d is the desired level of precision, set at 5% (d = 0.05).

$$N = \frac{1.96^2 \times (0.389 \times 0.611)}{0.05^2} = 365$$

After adjusting for an anticipated 10% non-response rate, the final minimum sample size was 401.

Data Collection Procedure

A systematic sampling was used to recruit patients in which every 2nd patient that met the inclusion criteria was selected. A standardized questionnaire was used to collect information on socio-demographic, clinical details and selected risk factors about dyspepsia from the study patients (figure1). A Short-form of Leeds Dyspepsia Questionnaire SF-LDQ was used to assess symptoms and severity of dyspepsia. A total symptom frequency score of ≥ 4 out of 16 indicates dyspepsia. It also assesses the most bothersome symptoms (indigestion, heartburn, regurgitation and nausea in the last 2 months). SF-LDQ also has dyspepsia severity scores (very mild dyspepsia =4. mild dyspepsia = 5-8, moderate dyspepsia = 9-15 and severe dyspepsia = 16-32). The Short Form Nepean Dyspepsia Index (SF-NDI) was used to assess the impact of dyspepsia on participants quality of life. The SF-NDI assess 10 sub-domains with a 5 -point scale from 1 to 5 with a score range of 10 (lowest) and 50 (highest) A low or poor quality of life is associated with higher scores > 30 points and a good quality of life ≤30 points. A digital BP machine was used to measure blood pressure in mmHg, a standard digital weighing scale to measure weight in kilograms, and a stadiometer used to measure height in meters.

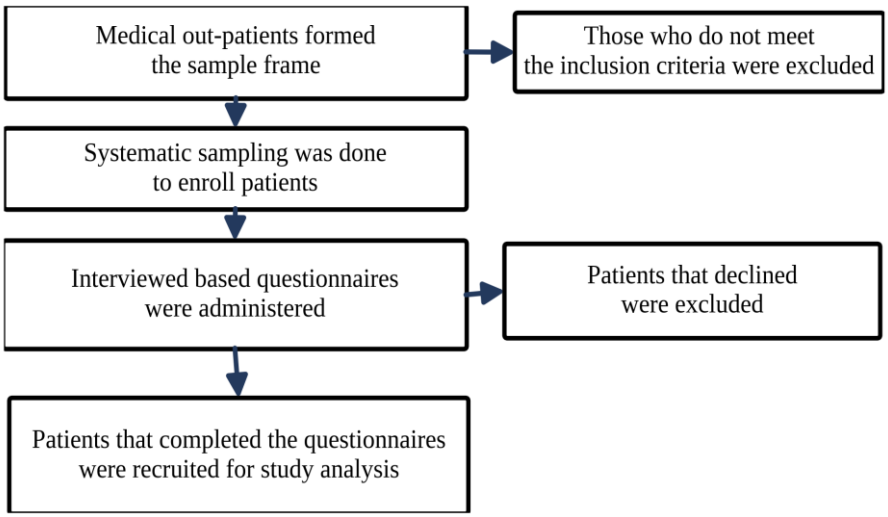

Figure 1. Participants Recruitment into the Study

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Data Analysis

Data was analyzed using the statistical package for social sciences (SPSS 28). Continuous variables were presented as mean ± standard deviation (SD). Categorical variables were measured in frequencies and percentages, and presented using bar and pie charts. Statistical associations were determine using logistics regression models such as: univariable and multivariable binary logistic regression, simple and multiple linear regression models, with a p- values < 0.05 considered statistically significant (α=0.05).

Results

Patients' Sociodemographic Information

A total of 401 patients were recruited into the study: 173(43.1%) males and 228(56.9%) females (Table 1). With regards the age bracket of the patients, 89(22.2%) were in the age bracket of 38 – 47 years, and only 24(6.0%) were in the age group of 68 – 77 years (Table 1). Out of the total participants, 167(41.6%) attained tertiary education, while 86(21.4%) never attended formal education (Table 1). Investigation of the marital status of the patients revealed that 247(61.6%) were married, while 125(31.2%) were single; 219(54.6%) were Muslims; and 219(54.6%) were employed (Table 1). With regards the income categories of the patients, 183(45.6%) had monthly income of >Le 500. 77(19.2%), and only 1(0.2%) earned Le 4000 - < 5000 (Figure 2).

Table 1. Patients' Sociodemographic Information

Variable	Sub-variables	Frequency	Percent
Gender	Male	173	43.1
	Female	228	56.9
Age groups	18 - 27	57	14.2
	28 - 37	111	27.7
	38 - 47	89	22.2
	48 - 57	80	20.0
	58 - 67	40	10.0
	68 - 77	24	6.0
Educational level	None	86	21.4
	Primary	28	7.0
	Secondary	120	29.9
	Tertiary	167	41.6
Marital status	Single	125	31.2
	Married	247	61.6
	Separated/Divorced	3	0.7
	Widowed	26	6.5
Religion	Christian	182	45.4
	Muslim	219	54.6
Employment status	Employed	219	54.6
	Unemployed	182	45.4

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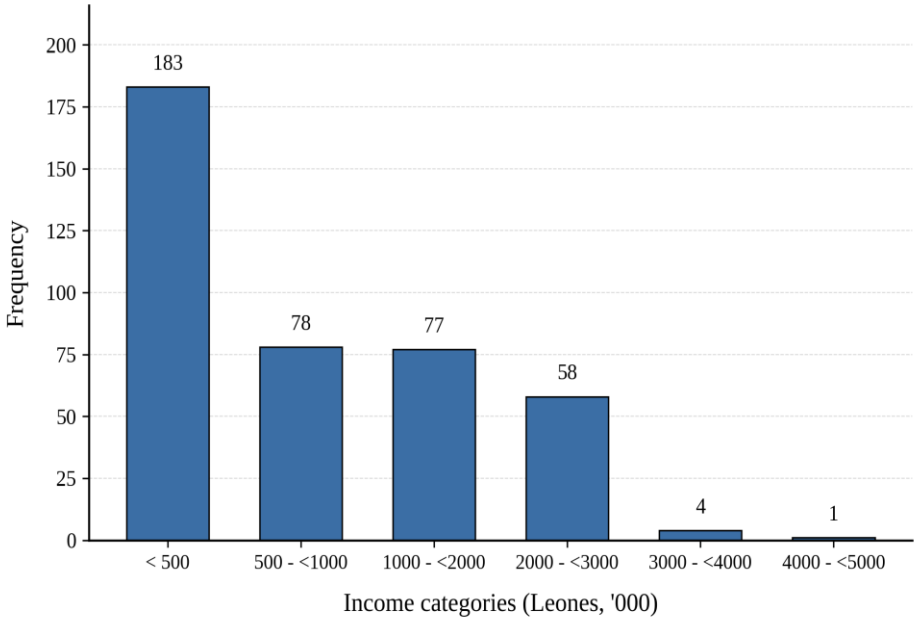

Figure 2. Distribution of Patients by Average Monthly Income Categories

Patients' Clinical and Risk Factors Characteristics

Out of the 401 participants, 121(30.2%) were hypertensive; and 134(33.4%) were overweight (Table 2); 266 (66.3%) had dyspepsia (Figure 3); and among patients with dyspepsia 119(44.7%) severe dyspepsia (Figure 4). Analysis of the most troublesome dyspeptic symptoms reported by patients showed that 29(7.2%) had nausea, 72(18.0%) had heartburn, and 151(37.7%) had indigestion (Table 3).

Alcohol intake was done by 121 (30.2%) patients, and 44(11.0%) were cigarette smokers (Table 4). Regular use of NSAIDs was practiced by 82(20.4), 13(3.2) regularly used steroids, 65(16.2) regularly used kola nuts, 87(21.7) regularly use Nescafe, 176(43.9) regularly drink energy drinks, 216(53.9) regularly eat spicy food, and 210(52.4) regularly eat late meals (Table 5). Documented comorbidities revealed that 32 (8.0%) had diabetes, 20 (5%) had gall bladder stones, 14 (3.5%) had GI cancer while 12 (3.0%) had liver cirrhosis (Table 6).

Table 2. Summary of Patients' Clinical Characteristics

Variables	Sub-variables	Frequency	Percent
Hypertension	Non-hypertensive	280	69.8
	Hypertensive	121	30.2
BMI	Under weight	19	4.7
	Normal	156	38.9
	Over weight	134	33.4

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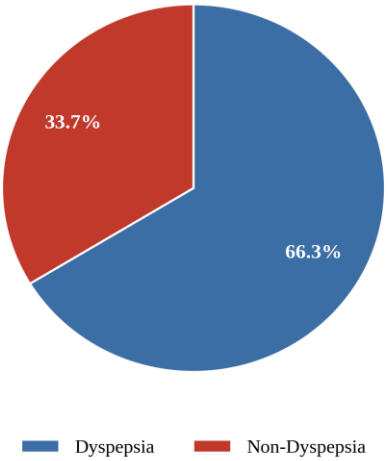

Figure 3. Distribution of Patients by Dyspeptic Categories

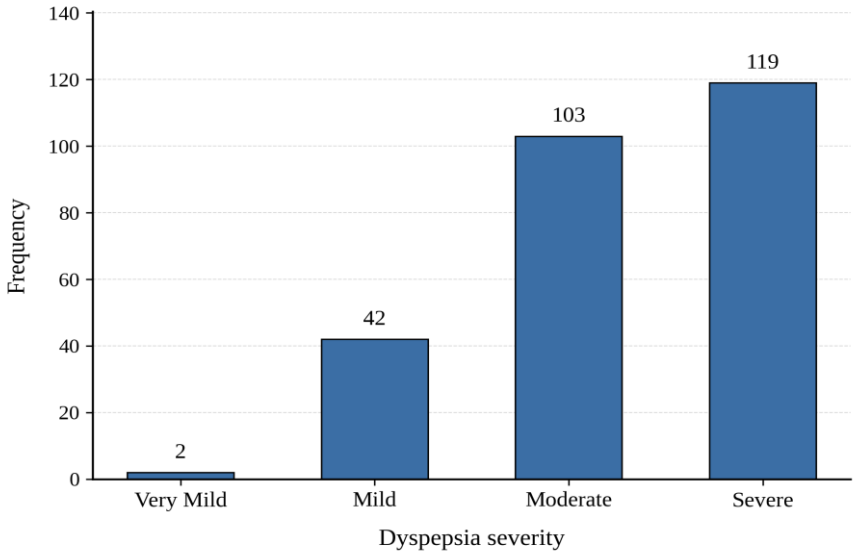

Figure 4. Severity of Dyspepsia among Dyspeptic Patients

Table 3. Synopsis of the Most Troublesome Dyspeptic Symptoms Reported by Patients

Symptoms	**Frequency**	**Percent**	**Cumulative %**
Indigestion	151	37.7	37.7
Heartburn	72	18.0	55.6
Regurgitation	23	5.7	61.3
Nausea	29	7.2	68.6
None	126	31.4	100.0
Total	**401**	**100.0**	

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Table 4. Patients Smoking and Alcohol Consumption Distribution

Variables	Sub-variables	Frequency	Percent
Alcohol intake (N=401)	Yes	121	30.2
	No	280	69.8
Types of alcohol (N=121)	Beer and/or Stout	78	64.5
	Wine	32	26.4
	Liquor	9	7.4
	Local alcoholic drinks	2	1.7
Qty. of beer/Stout (N=78)	1 drink daily	24	30.8
	2-3 drinks daily	43	55.1
	>3 drinks daily	11	14.1
Qty. of wine (N=32)	1 glass daily	11	34.4
	2-3 glasses daily	19	59.4
	>3 glasses daily	2	6.3
Qty. of liquor (N=9)	1 drink daily	1	11.1
	2-3 drinks daily	5	55.6
	>3 drinks daily	3	33.3
Qty. of local alcohol (N=2)	1 drink daily	0	0.0
	2-3 drinks daily	1	50.0
	>3 drinks daily	1	50.0
Cigarette smoking (N=401)	Yes	44	11.0
	No	357	89.0
Daily cigarette smoked (N=44)	≤ 5 Sticks daily	37	84.1
	> 5 Sticks daily	7	15.9

Table 5. Presentation of Other Risk Factors of Dyspepsia

Risk Factors of dyspepsia	Yes N(%)	No N(%)
Regular use NSAIDS	82(20.4)	319(79.6)
Regular use steroids	13(3.2)	388(96.8)
Regular use kola nut	65(16.2)	336(83.8)
Regular use Nescafe	87(21.7)	314(78.3)
Regular use energy drinks	176(43.9)	225(56.1)
Regular eating of spicy meals	216(53.9)	185(46.1)
Regular eating of late meals	210(52.4)	191(47.6)

Table 6. Summary on Patients' Comorbidities

Variables	Sub-variables	Frequency	Percent
Diabetes	Yes	32	8.0
	No	369	92.0
Hyperthyroidism	Yes	4	1.0
	No	397	99.0
Hypothyroidism	Yes	2	0.5
	No	399	99.5

Chronic pancreatitis	Yes	5	1.2
	No	396	98.8
Gall stones	Yes	20	5.0
	No	381	95.0
Liver cirrhosis	Yes	12	3.0
	No	389	97.0
GI cancers*	Yes	14	3.5
	No	387	96.5

** GI cancers (Liver, pancreas, gall bladder, esophagus, stomach, colon). Gastric cancer =9, Pancreatic cancer =2, and Liver cancer =3*

Summary of Patients' Quality of Life Information and Associated Factors

Out of the total patients, 286(71.3%) had good quality of life (SF-NDI scores ≤ 30) and 115(28.7%) had poor quality of life (SF-NDI Scores > 30) (Figure 5).

Using the patients' SF-NDI quality of life scores as dependent variable, we performed linear regression analyses. In both univarible and multiple linear regression models, patients' gender, age and employment status were not significantly associated with the patients' quality of life (all P-values > 0.05) (Table 7). However, the patients' dyspepsia scores and dyspepsia severity scores were significantly associated the quality of life in the univariable model (P<0.001), but in the multivariable model, only the dyspepsia severity scores were significantly associated quality of life (P<0.001), while the dyspepsia scores were not (P = 0.094) (Table 7).

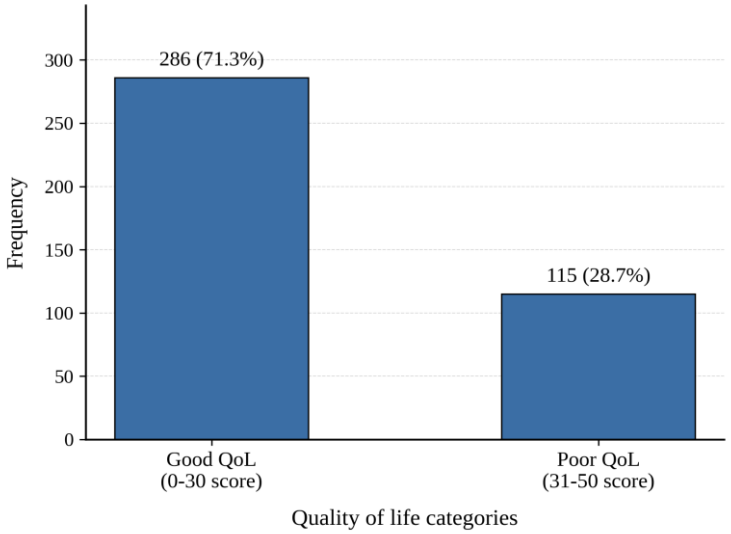

Figure 5. Distribution of Patients by Quality of Life Categories

Table 7. Association between Patients' Quality of Life and Dyspepsia

Variables	**Beta**	**95% CI**		**P-value**
		Lower	**Upper**	
Univariable model				
Gender	0.039	-1.251	2.927	0.431
Age	0.041	-0.042	0.101	0.417
Employment	-0.009	-2.271	1.888	0.856

Dyspepsia scores	0.659	1.237	1.550	**<0.001**
Dyspepsia Severity scores	0.671	0.635	0.790	**<0.001**
Multivariable model				
Gender	0.043	-0.658	2.492	0.253
Age	0.034	-0.029	0.078	0.364
Employment	0.012	-1.321	1.828	0.752
Dyspepsia scores	0.215	-0.078	0.987	0.094
Dyspepsia Severity scores	0.465	0.227	0.762	**<0.001**

CI = Confidence Interval. Bold figures represent statistically significant findings

Investigation of Risk Factors Associated with Dyspepsia

Using patients' dyspepsia status as dependent variable, we performed binary logistics regression analysis and our findings showed that in both the univariable and multivariable model, risk factors such as regular use of NSAIDs, steroids, kola nuts, Nescafe, energy drinks, spicy meals, late meals, alcohol, and cigarette smoking were not significantly associated with dyspepsia (all P-values >0.05) (Table 8).

Table 8. Summary of the Investigation of Risk Factors Associated with Dyspepsia

Variables	***OR***	***95% CI***		***P*-value**
		Lower	**Upper**	
Univariable				
Regular use of NSAIDs	1.615	0.936	2.789	0.085
Regular use of steroids	1.147	0.347	3.794	0.822
Regular use of Kola nut	1.679	0.915	3.082	0.094
Regular use of Nescafe	1.089	0.656	1.808	0.741
Regular Use of energy drinks	1.214	0.798	1.847	0.366
Regular use of spicy meals	1.130	0.746	1.711	0.565
Regular use of late meals	1.128	0.745	1.708	0.568
Alcohol drinking	1.291	0.815	2.046	0.276
Cigarette smoking	1.402	0.697	2.818	0.343
Multivariable				
Regular use of NSAIDs	0.806	0.357	1.821	0.604
Regular use of steroids	1.323	0.243	7.196	0.746
Regular use of Kola nut	2.337	0.903	6.049	0.080
Regular use of Nescafe	0.933	0.417	2.089	0.866
Regular Use of energy drinks	1.237	0.553	2.766	0.604
Regular use of spicy meals	0.911	0.277	3.000	0.878
Regular use of late meals	0.838	0.258	2.724	0.768
Alcohol drinking	1.457	0.760	2.794	0.257
Cigarette smoking	2.164	0.829	5.650	0.115

Discussion

This study investigated the prevalence and severity of dyspepsia, as well as its impact on quality of life (QoL), among medical outpatients at the 34 Military Hospital, a tertiary facility in Sierra Leone. The overall prevalence of dyspepsia was 66.3%. Among

dyspeptic patients, severity was classified as severe (44.7%), moderate (38.7%), mild (15.8%), and very mild (0.8%). Assessment of overall well-being revealed that 71.3% of patients experienced a good QoL, whereas 28.7% reported a poor QoL. Furthermore, statistical analysis demonstrated a highly significant correlation between increased dyspepsia severity and reduced QoL (\(p < 0.001\)). Notably, in both univariable and multivariable models, dyspepsia was not significantly associated with the regular use of NSAIDs, steroids, kola nuts, Nescafe, energy drinks, spicy meals, late meals, alcohol, or cigarette smoking (all $p > 0.05$).

From our study the prevalence of dyspepsia was 66.3% and majority had severe form of dyspepsia 44.7%. This prevalence is higher than that reported in a Rwandan study by Bitwayiki and team in 2015 in which they reported a prevalence of 38.9% and severe dyspepsia of 10.2%[10]. Although both studies utilized identical assessment tools—the Short-Form Leeds Dyspepsia Questionnaire (SF-LDQ) and the Short-Form Nepean Dyspepsia Index (SF-NDI)—the observed discrepancies in prevalence and severity may stem from differences in study populations and sampling techniques. Specifically, our study evaluated medical outpatients, whereas Bitwayiki et al. [10] primarily enrolled healthy healthcare workers. Notably, both studies demonstrated a significant association between dyspepsia and a reduced quality of life.

The prevalence of dyspepsia in this study was 66.3%, which is substantially higher than the 14.1% reported in a larger, population-based Rwandan study by Bangamwabo et al. in 2020 [11]. Although both studies utilized the Short-Form Leeds Dyspepsia Questionnaire (SF-LDQ), discrepancies in sample sizes, study populations, and methodologies likely account for this wide variation. Furthermore, both investigations identified a significant association between dyspepsia and a reduced quality of life, as measured by the Short-Form Nepean Dyspepsia Index (SF-NDI).

In the present study, 28.7% of patients experienced a reduced quality of life, compared to the 92.6% reported by Egbo et al. [12].This discrepancy likely stems from differences in the study populations; Egbo and colleagues evaluated known dyspeptic patients undergoing upper gastrointestinal endoscopy, who were inherently more likely to present with severe symptoms impacting their quality of life.

Our study also showed a higher prevalence of dyspepsia compare to that reported in a Ghanaian population-based study by Olecki et al in which they enrolled patients visitors and the prevalence was 25.5% [8]

Our study also revealed a higher dyspepsia prevalence of 66.3% using the Short Form Leeds Dyspepsia Questionnaire (SF-LDQ) in comparison to a study done in a referral hospital in Ethiopia by Seid et al. in 2018 in which they found out that 48.4% of patients had dyspepsia using the ROME III criteria [13]. This variation in prevalence may be related to the differences in dyspepsia questionnaires used as well as the sample sizes. Seid and team also reported that there was a statistically significant correlation between NSAIDs use ,regular intake of tea and dyspepsia (p-values < 0.001) [13]. Our study found no statistical association between the use of alcohol, smoking, NSAIDs, Nescafe energy drinks and dyspepsia (p values > 0.05).

A lower prevalence of dyspepsia (44.7%) was reported in a study done in a Nigerian teaching hospital in 2011 by Efealukwu in which they also found a significant correlation between dyspepsia and coffee intake as well as alcohol intake (p values < 0.001) [14]. This dyspepsia prevalence as well as associated risks factors differs from that reported in our own study despite both are done within the sub-region with similar study settings.These variations are likely due to the distinct questionaire type in each study. In addition another Nigerian study done by , Ogunmodede et al, they also reported a lower dyspepsia

prevalence of 37.5% [15] compared to our study 66.5%. However both studies identified epigastric pain (indigestion) as the most frequent symptom of dyspepsia reported.

Two Asian studies revealed lower dyspepsia prevalence rates – Huang et al in Indonesia reported a prevalence of 49.75% using ROME III criteria for dyspepsia [16], while Khademolhosseini et al reported a prevalence of 29.9% using a gastroenterologist directed questionnaire [17].

In Zhejiang Province, China, Li and co-researchers reported a significantly lower dyspepsia prevalence of 5.6% using Rome III criteria among college students [18]. This heterogeneity in dyspepsia prevalence may stem from variations in sample sizes, diagnostic questionnaires, and study populations.

Sharma B et al also reported a lower dyspepsia prevalence of 39.3% [19] in a case-control Indian study in comparison to our study with a higher prevalence of 66.3%.

A lower prevalence of dyspepsia 14.6% was also reported in a Malaysian study by Mahadeva et al in which they also found an association between dyspepsia and poor quality of life [20]. The variations in the prevalence from our study could be due to the differences in dyspepsia screening questionaire.

In our study, the prevalence of dyspepsia (66.3%) closely mirrored the 66.1% reported in a Saudi Arabian cohort by Masoodi in 2018 [21]. Despite differences in study populations and sample sizes, both investigations utilized a cross-sectional observational framework and the SF-LDQ assessment tool. This methodological alignment likely accounts for the near-identical prevalence rates. Furthermore, Masoodi noted a significant association between NSAID consumption and dyspeptic symptoms ($p < 0.001$) [21].

However, in a second Saudi Arabian observational survey by Alwhaibi et al in 2020, a higher dyspepsia prevalence of 92% [22] was recorded, compared to 66.3% in our study. Furthermore, in a study conducted in the United Arab Emirates (UAE) by Jaber et al. in 2016, the reported dyspepsia prevalence was 43.8% using the Short-Form Leeds Dyspepsia Questionnaire (SF-LDQ) [23]. This variability in prevalence, despite the utilization of the same screening tool, could be attributed to the heterogeneity of the study populations as well as differences in sample sizes.

In Yemen, Al-Bishi, A. M. N reported a higher dyspepsia prevalence of 80% among outpatients in a gastroenterology clinic using Rome III criteria compare to our study 66.3%. Differences in dyspepsia screening questionaire and study population could account for these disparities [24].

In our study we found out a higher prevalence of dyspepsia (66.3%) compared to that reported in Latin America countries including Peru (27%), El Salvador (38%), Mexico (29%) and Colombia (37%). These differences could be explained by the differences in study population and sample sizes [25].

Our study reported a higher prevalence of dyspepsia in comparison to data from Western countries, including Sweden (20.2%) by Aro et al. in 2009 [26] and New Zealand (34.2%) by Haquel et al. in 2000 [27] . This variation may stem from a greater burden of Helicobacter pylori infection in developing countries relative to Western nations. Indeed, H. pylori plays a well-established role in the pathogenesis of both functional and organic dyspepsia.

Conclusion

Our study revealed high burden of dyspepsia in our study population, with a dyspepsia prevalence of 66.3%. Poor Quality of Life was reported in 28.7% of the study patients while more than two-thirds reported good quality of life. The investigation further revealed a significant association between severity of dyspepsia and patients' Quality of Life ($p<0.001$). Patients demonstrated varying proportions of dyspepsia risk factors, with 30.2% of patients admitted consuming alcohol

while 11.0% were smokers. The study also showed that 53.9% consume regular spicy meals, 52.4% have regular late meals, 20.4% of patients do take regular NSAIDs, 43.9% consumed energy drinks and 21.7% take regular Nescafe use. However, despite the quality evidence provided in this research, we recommend a multi-center, larger sample size study to provide a more generalizable estimate of the true prevalence and burden of dyspepsia in Sierra Leone.

Data Availability

The dataset analysed in this current study is available from the corresponding author upon reasonable request, subject to ethical approval and institutional data-sharing policies/agreements.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

Conflict of Interest

The authors declare there are no conflicts of interest related to this study.

Ethical Consideration

Study approval was obtained from the Texila American University TAU, Guyana in partnership with the University of Central Nicaragua UCN, Nicaragua. Ethical clearance was obtained from Sierra Leone Ethics and Scientific Review Committee (SLESRC No 011/02/2023). Permission was also obtained from the 34 Military Hospital administrations before study commencement.

The purpose of the study was explained to all the study participants and written informed consent was provided before recruitment into the study. Blood pressure results and severity of dyspepsia scores were communicated to the patients and attending physician for appropriate medical care. Patient confidentiality was maintained and questionnaires were coded. Patients were free to withdraw at any point in the study without any discrimination or loss of routine medical care.

Author Contributions

- **Kanu Joseph E:** Design of study, data collection, major financing, read the drafts and made in-put. Corresponding author.
- **Sovula Haja S:** Data collection read through manuscript drafts and made in puts.
- **Kanu Joseph S:** Design of the study, assist in analysis of data , read through the drafts and made in puts.

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