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Prevalence, Quality of Life and Factors Associated with Dysmotility Among Outpatients in Dar Es Salaam, Tanzania: A Cross-Sectional Study

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ABSTRACT

Background: Dysmotility (the most common form of dyspepsia) is highly prevalent in Western countries; however, there is little data regarding its prevalence, pattern, associated factors and impact on the quality of life in African countries. The aim of this study was to determine the prevalence, pattern, quality of life and factors associated with dysmotility among outpatients attending a regional hospital in Dar es Salaam, Tanzania.

Methods: Between June 2013 and July 2013, a total of 1062 adults aged 18 years and above were recruited into this cross-sectional study and completed validated Swahili-language self-administered questionnaires. The Frequency Scale for the Symptoms of GERD Questionnaire was used as a diagnostic tool for dysmotility. Quality of life was assessed using the Quality of Life in Reflux and Dyspepsia (QOLRAD) Questionnaire. The prevalence of dysmotility was expressed as a proportion. The quality of life was expressed as Mean Quality of Life in Reflux and Dyspepsia (QOLRAD) dimension scores and was compared between subjects with dysmotility and subjects without dysmotility. Logistic regression analysis was used to test the significance of the associations between predictor variables and dysmotility. A p value of < 0.05 was considered significant.

Results: The mean age $\pm$ standard deviation of the study subjects was 46.0 $\pm$ 19.5 years and 60.5% were females. The prevalence of dysmotility was 35.0%. Current alcohol consumption (OR = 1.65, 95% CI; 1.01-2.71) was independently associated with dysmotility while male gender (OR = 0.71 95% CI; 0.53-0.94) was associated with 29% decreased odds of having dysmotility. The quality of life in subjects with dysmotility was lower than that of subjects without dysmotility in all five domains of the QOLRAD Questionnaire. Majority of patients with dyspepsia (66.9%) had sought medical advice and 67.7% took medications for their symptoms.

Conclusions: The prevalence of dysmotility is high in this hospital-based population. Male gender was associated with decreased odds of having dysmotility whereas current alcohol consumption was an independent risk factor for dysmotility. Dysmotility causes a significant impairment in the quality of life. Majority of patients with dysmotility seek medical advice and also take medications for symptom relief.

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Introduction

Dyspepsia is a common complaint among individuals seeking medical care as well as in general population [1-6]. The Rome IV criteria define dyspepsia as any combination of 4 symptoms: postprandial fullness, early satiety, epigastric pain, and epigastric burning that are severe enough to interfere with the usual activities and occur at least 3 days per week over the last 3 months with an onset of at least 6 months in advance [7]. Dyspepsia is classified primarily as Organic Dyspepsia, caused by a specific disease (ulcers, cancer, reflux), and Functional Dyspepsia (FD), where no structural cause is found. FD is further categorized by symptoms into Postprandial Distress Syndrome (PDS) (fullness, early satiety) and Epigastric Pain Syndrome (EPS) (pain, burning). A third category, "uninvestigated dyspepsia," refers to symptoms before a diagnosis is made, with investigation revealing either organic or functional causes [8-10].

Clinically, dyspepsia can be further classified into four categories. Ulcer-like dyspepsia is defined as upper abdominal pain with at least two of the following four symptoms: a) pain often relieved by food, b) pain often relieved by antacids or food, c) pain before meals or when hungry, and d) night pain. Dysmotility-like dyspepsia refers to upper abdominal pain with at least three of the four symptoms: a) abdominal bloating and distension, b) pain often aggravated by food, c) pain often relieved by belching, and d) early satiety. Reflux-like dyspepsia is considered to be present if there is heartburn or acid regurgitation, or both. Nonspecific dyspepsia is upper abdominal pain or nausea that does not fit into the other categories. This study focused on dysmotility-like and reflux-like dyspepsia.

The prevalence of dyspepsia varies throughout the world from 8.5% to 56% due to different diagnostic criteria, time differentiation, environmental and dietary factors, H. pylori infection, lifestyle, and other factors. However, few studies have been conducted in

Africa to try to establish the prevalence of dyspepsia, the factors associated and its impact on the quality of life.

This study was conducted to determine the prevalence, pattern, quality of life and factors associated with dysmotility among outpatients attending a regional hospital in Dar es Salaam, Tanzania.

Materials and Methods

Study Design and Setting

This was a hospital-based cross-sectional study that was conducted between June 2013 to July 2013 at Mwananyamala Regional Referral Hospital, which serves as a regional referral hospital for both private and public health facilities in the Kinondoni region in Dar es Salaam. The hospital serves as a referral hospital for a population of more than 2 million people. On average about 1500-1700 patients attend the hospital's outpatient clinics every day.

Study Population and Data Collection Tools

All adults aged 18 years or above attending the outpatient clinics at Mwananyamala Regional Referral Hospital were eligible for the study. The outpatient clinics comprised the following units: general outpatient clinic, reproductive and child health clinic, oral health clinic, eye clinic, diabetes clinic, tuberculosis and leprosy clinic, mental health clinic, voluntary care and testing clinic, National Health Insurance Fund clinic, HIV/AIDS care and treatment clinic and physiotherapy clinic. There were no exclusion criteria. All participants completed the Swahili versions of the Frequency Scale for the Symptoms of GERD (FSSG) questionnaire and the Quality of Life in Reflux and Dyspepsia (QOLRAD) questionnaire. FSSG is a widely used questionnaire for the diagnosis of GERD and evaluation of the effectiveness of treatment [11,12]. Both questionnaires were translated into Swahili and then back-translated from Swahili to English to ensure validity. Questions of FSSG consist of acid reflux symptoms and dysmotility symptoms. Dysmotility symptoms were evaluated by 4 items as follows: "Does your stomach get bloated?", "Does your stomach ever feel heavy after meals?", "Do you ever feel sick after meals?", and "Do you feel full while eating meals?" In FSSG, each question can be scored on five points: 0 = "never", 1 = "occasionally", 2 = "sometimes", 3 = "often", or 4 = "always". Subjects with more than two points in any item among the dysmotility symptoms were considered to have dysmotility.

QOLRAD consists of 25 items combined into five dimensions: emotional distress, sleep disturbance, vitality, food/drink problems and physical/social functioning. All questions were rated on a seven-point Likert scale according to the response options. The lower the value on the QOLRAD questionnaire, the more severe the impact on daily function.

In addition, another questionnaire was used to gather information on demographic characteristics (age, gender, weight, height, educational level, occupation, marital status,), predominant symptom(s) and duration of symptom(s), factors thought to affect the occurrence of dysmotility (such as alcohol consumption and cigarette smoking), consultation behavior, previous treatments for dysmotility, and dietary intake (high fat diet, high protein diet, high carbohydrate diet, carbonated drinks, coffee). The questionnaires were self-administered and research assistants clarified the questions in cases where participants faced difficulties in filling the questionnaires.

Data Analysis

All filled questionnaires were coded before entering into the computer using Statistical Package for Social Sciences (SPSS) version 20.0 statistical software. This software was also used for data analysis. Frequency distributions and two-way tables were used to summarize the data. The quality-of-life scores were compared using Student's t-test. Multiple logistic regression analysis was performed to determine associations; in this model, all factors with a p-value ≤ 0.2 in the univariate analysis were included in the multivariate analysis. A p-value of ≤ 0.05 was considered significant for the multivariate analysis and for the student's t-test.

Ethical Consideration

Ethical clearance was obtained from Muhimbili University of Health and Allied Sciences ethical committee. Permission to conduct the study at Mwananyamala Hospital was obtained from the District Medical Officer's office and the hospital's administration. Each patient provided a written informed consent before participating in this study and all information obtained from the study participants was kept confidential. All patients diagnosed with dysmotility were directed to the appropriate medical clinic for appropriate care of their symptoms.

Results

Characteristics of Study Subjects

A total of 1200 patients attending Mwananyamala Hospital for consultations at the outpatient clinics were selected by systematic sampling technique and asked to complete the FSSG and QOLRAD questionnaires. Thirty-eight patients refused to participate in the study. Therefore, 1062 persons (419 [39.5%] males and 643 [60.5%] females) with a mean age of 46.0 ± 19.5 years were finally included in this study. Majority of the participants (60%) were married; 102 (9.6%) were obese; 55 (5.2%) were current smokers; and 278 (26.2%) had no formal education.

Table 1: Demographic Characteristics of the Study Subjects (N =1062)

Variable	Frequency (Percentage)
Mean age in years (SD)	46.0 (19.5)
Age groups (years)	
18-40	501 (47.2)
41-60	264 (24.9)
61+	297 (27.9)
Sex	
Male	419 (39.5)
Female	643 (60.5)
BMI (kg/m ²)	
<18.5	67 (6.3)
18.5 -24.9	631 (59.4)
25 – 29.9	262 (24.7)
30+	102 (9.6)
Marital status	
Single	258 (24.3)
Married	637 (60.0)
Ever	167 (15.7)
Education	
No	278 (26.2)

Primary	564 (53.1)
Secondary	179 (16.9)
Higher	41 (3.9)
Smoking	
Never	894 (84.2)
Ever	113 (10.6)
Now	55 (5.2)
Alcohol	
Never	722 (68.0)
Ever	217 (20.4)
Now	123 (11.6)
Income (Tsh)	
<100000	737 (69.4)
100000– 500000	309 (29.1)
>500000	4 (0.4)

Abbreviations: BMI = Body Mass Index, TSH = Tanzanian Shilling

Prevalence and Pattern of Dysmotility

The prevalence of dysmotility was 35%. Majority of participants with dysmotility (166/371 [48.5%]) reported a duration of less than 6 months of their symptoms. Similarly, majority of participants (316/371 [92.1%]) had symptoms at least once weekly. Severe symptoms were experienced by 55.4% (184/371) of patients with dysmotility. Most individuals with dysmotility had at one moment sought medical advice for their symptoms or used some medicines to control their symptoms (Table 2).

Table 2: Pattern of Dysmotility (N = 371)	
Variable	Frequency (Percentage)
Duration of symptoms (months)	
< 6	166 (48.5)
6-11	98 (28.7)
12-59	53 (15.8)
60+	24 (7.0)
Symptom frequency	
Daily	81(23.8)
Weekly	235 (69.1)
Monthly	23 (6.8)
Yearly	1 (0.3)
Symptom severity	
Mild	27 (8.1)
Moderate	121(36.4)
Severe	184 (55.4)
Consulted health care provider	247 (66.9)
Used medicines	251(67.7)

Factors Associated with Dysmotility

Table 3 shows univariate and multivariate analyses of risk factors for dysmotility. Subjects with dysmotility were significantly older than those who did not have dysmotility. In the univariate analysis, married participants were 36% less likely to have dysmotility compared to those who were single (cOR 0.64; 95% CI: 0.420-0.96; p 0.031) and current alcohol consumers were associated 72% increased odds of having dysmotility compared to the those who never consumed alcohol (cOR 1.72; 95% CI: 1.06-2.79; p 0.027) while male gender was associated with a 29% less likelihood of having dysmotility (cOR 0.71; 95% CI: 0.55-0.92; p 0.011).

In the multivariate analysis, current alcohol consumption was independently associated with 35% increased odds of having dysmotility (cOR 1.65; 95% CI: 1.01-2.71; p 0.046) while male gender was independently associated with a 29% less likelihood of having dysmotility. (COR 0.71; 95% CI: 0.53-0.94; p 0.018)

Table 3: Univariate and Multivariate Analyses of the Factors Associated with Dysmotility (N = 1062)

Variable	cOR (95% CI)	P-value	aOR (95% CI)	P-value
Age groups (years)				
18-40	1			
41-60	0.82 (0.60-1.11)	0.193	0.89 (0.61-1.32)	0.567
61+	1.19 (0.85-1.68)	0.315	1.15 (0.79-1.67)	0.458
Sex				
Female	1		1	
Male	0.71 (0.55-0.92)	0.011	0.71 (0.53-0.94)	0.018
BMI (kg/m²)				
18.5 -24.9	1			
<18.5	1.32 (0.69-2.48)	0.395		
25 – 29.9	1.002 (0.65-1.55)	0.993		
30+	0.865 (0.53-1.40)	0.556		
Marital status				
Single	1			

Married	0.64 (0.420-0.96)	0.031	0.80 (0.49-1.31)	0.375
Ever	0.93 (0.658-1.33)	0.705	1.06 (0.72-1.56)	0.769
Education				
No	1			
Primary	1.85 (0.87-3.93)	0.108	1.52 (0.69-3.33)	0.299
Secondary	1.703 (0.82-3.55)	0.155	1.57 (0.75-3.32)	0.233
Higher	1.45 (0.67-3.16)	0.351	1.54 (0.69-3.37)	0.286
Smoking				
Never	1			
Ever	0.99 (0.56-1.75)	0.962		
Now	1.30 (0.67-2.54)	0.442		
Alcohol				
Never	1			
Ever	1.48 (0.97-2.27)	0.072	1.38 (0.89-2.14)	0.150
Now	1.72 (1.06-2.79)	0.027	1.65 (1.01-2.71)	0.046
Income (TSh)				
<100000	1			
105 – 500000	1.63 (0.17-15.71)	0.675		
>500000	1.59 (0.16-15.46)	0.690		

COR – Crude Odds Ratio, AOR – Adjusted Odds Ratio, TSH – Tanzania Shilling

Quality of Life of Subjects with Dysmotility

Figure 1 shows a comparison between the mean QOLRAD dimension scores for patient with dyspepsia and those without dyspepsia. Participants who did not have dyspepsia had significantly higher QOLRAD mean dimension scores than those who had dyspepsia in all five QOLRAD domains (emotional distress, sleep disturbance, food/drink problems, physical/social functioning and vitality). This indicates that dyspepsia negatively impacted the health-related quality of life among the study participants who were diagnosed with dysmotility.

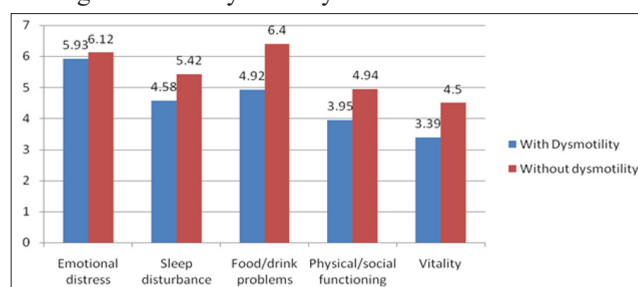


Figure 1: Comparison of Mean Quality of Life in Reflux and Dyspepsia (QOLRAD) Dimension Scores Between Subjects with Dysmotility and Subjects Without Dysmotility (N = 1062)

Discussion

In this study we aimed to determine the prevalence, pattern, quality of life and factors associated with dysmotility among patients attending at Mwananyamala Regional Referral Hospital in Dar es salaam, Tanzania. The prevalence of dysmotility was 35% using the FSSG as a diagnostic tool. The health-related quality of life was found to be significantly low among participants who had dysmotility compared to those who did not have it as assessed by the QOLRAD questionnaire. Additionally, alcohol consumption was found to be independently associated with an increased risk of having dysmotility while male gender was an independent factor associated with a less likelihood of having dysmotility.

Dysmotility, the most frequent form of dyspepsia, is a common medical disorder which has varying prevalence rates in different parts of the world [13]. Studies of the epidemiology of dyspepsia have been complicated by the use of different symptom definitions, subject populations and time frames of investigation [14]. The prevalence of dysmotility of 35% found in the current study based on the FSSG Questionnaire criteria was high but it is not dissimilar from figures obtained elsewhere around the globe. For example, a systematic review by El-Serag et al (13) revealed that the prevalence of uninvestigated dyspepsia was in the range of 10-40% among the 22 studies that were reviewed. The systematic review estimated the prevalence of dyspepsia based on reports from 13 countries in four continents (Asia, North America, Europe and Oceania); however, no data was available from Africa. Studies in Africa performed in Nigeria, Rwanda and Ethiopia have indicated that the prevalence ranges between 14% and 48% The highest prevalence of 48% reported in Ethiopia (3) was among people who presented to a referral hospital with gastrointestinal complaints, which is in contrast to the current study where subjects were recruited irrespective of their primary complaints be it gastrointestinal or not [15,16]. It should also be noted that one of the important criteria for the diagnosis of dyspepsia is abdominal pain. The current study only estimated the prevalence of dysmotility, which is a subset of conditions that constitute dyspepsia and abdominal pain is not among of its symptoms. Other subsets of dyspepsia are ulcer-like symptoms, reflux-like symptoms and nonspecific dyspeptic symptoms. Therefore, the prevalence of dyspepsia might be higher if these other symptoms were considered in this study.

With regards to the associated factors, male gender was associated with decreased odds of having dysmotility. This was consistent with results from a study conducted in China among college students as well in the study from Rwanda; however, gender was not a significant factor in the two studies from Nigeria and in an Iranian study [17]. There is still no clear reason why there

is inconsistency of findings in studies examining the association between gender and dysmotility across the globe. Further studies need to be conducted to address this issue.

In our study, current alcohol consumption was an independent factor associated with dysmotility. However, this was not the case in studies conducted in Rwanda and Ethiopia, countries neighboring the mainland Tanzania.

Some reports showed that obese subjects have a higher risk for dyspepsia [18-20]. On the contrary, other studies have shown that dysmotility symptoms were more likely to be reported in subjects who are underweight than in subjects who have desirable weight and obese subjects [21-23]. The current study showed no association between dyspepsia and obesity which was in keeping with the Chinese study among college students.

These differences and conflicting results in relation to the factors associated with dysmotility are probably due differences in definition of dyspepsia, varying methodologies and study populations. For instance, in this study with over a thousand participants, only 55 (5%) were current smokers and another 10% were ex-smokers while in the Japanese study current smokers alone were over 20%; this underrepresentation of smokers in the current study could explain lack of association that was noticed.

Health-related quality of life is becoming increasingly important as an outcome measure of treatment response; this study demonstrates that the quality of life of individuals with dysmotility is significantly lower than that of the reference groups. These findings are consistent with those from other studies.

Generally, most individuals diagnosed with dysmotility had at one moment sought medical advice for their symptoms. This is similar to the situation in Nigeria (15) although most the subjects in Nigeria had sought medical advice from traditional healers. The high rate of health seeking behavior in the current study could be explained by the fact that most patients in present study described their symptoms as severe and moderately severe that were affecting their daily functioning. The pattern of taking medication paralleled that of seeking medical advice in this study.

The main limitation of this study is that the sample was derived from clinic attendants, whose characteristics may not reflect the magnitude, pattern, quality of life and factors related to dysmotility in patients in the general population. However, it has to be noted these were ambulatory and clinically stable patients who came to the hospital for reasons mostly unrelated to gastrointestinal complains; therefore, we believe the difference with the general population parameters related to dysmotility would be small.

In conclusion, this study has shown that the prevalence of dysmotility is high in this relatively selected patient population. Male gender was independently associated with a lesser likelihood of having dysmotility whereas current alcohol consumption was an independent risk factor for dysmotility. Lastly, dysmotility causes a significant impairment in the quality of life and majority of patients with dyspepsia sought medical advice and took medications for their symptoms.

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