Afr. J. Med. Med. Sci. (2022) 51(3) 147-156

Psychosocial characteristics and health-related quality of life among Nigerians with chronic constipation: A community-based study

AC Jemilohun[1], OO Adeleye[2], OA Fasesan[3], KO Akande[4], CJ Elikwu[5] and TO Ajiro[6]

Department of Medicine[1], Benjamin Carson Snr. School of Medicine, Babcock University, Ilisan-Remo, Department of Medicine[2], Olabisi Onabanjo University Teaching Hospital, Sagamu, Department of Medicine[3], Psychiatry Unit, Benjamin Carson Snr. School of Medicine, Babcock University, Ilisan-Remo, Department of Medicine[4], College of Medicine, University of Ibadan, Ibadan, Department of Medical Microbiology[5], Benjamin Carson Snr. School of Medicine, Babcock University and Department of Medicine[6], Babcock University Teaching Hospital, Ilisan Remo, Ogun State, Nigeria

Abstract

Background: The Rome IV iteration identifies three subtypes of constipation associated with the brain-gut axis: functional constipation (FC), irritable bowel syndrome with constipation (IBS-C) and opioid-induced constipation (OIC). This study was conducted to determine the prevalence, psychosocial characteristics and health-related quality of life of persons with brain-gut axis related chronic constipation in a Nigerian community.

Methodology: In a cross-sectional study, we obtained data from 515 adults in a Nigerian community with an instrument consisting of the Rome IV Functional Bowel Disorder questionnaire, the Becks Depression and Anxiety Inventories, the Short Form 12, version 2 Health Survey (SF-12v2) questionnaire and other relevant information. Data were analyzed with appropriate statistical instruments and summarized.

Results: A total of 505 participants were included in the data analysis. The sample mean age was 32.7 ±12.9 years. There were 15 participants [3.0% (95% CI, 1.6% - 4.8%)] with constipation by the Rome IV criteria: 8 [1.6% (95% CI, 0.6% - 2.8%)] had FC, 3 [0.6% (95% CI, 0.0% - 1.4%)] had OIC and 4 [0.8% (95% CI, 0.2% - 1.8%)] had IBS-C. The mean anxiety (15.1±10.7, vs 8.4±8.1, P = 0.030) and depression (17.0±12.5 vs 8.1±9.4, P = < 0.001) scores of participants with constipation was higher than those without constipation. Participants with constipation had lower mean scores in most of the SF12v2 scales with significant association in Physical Functioning (p < 0.001), Role Physical (p <0.001), Bodily Pain (p = 0.010) and Role Emotional (p < 0.001).

Conclusion: Persons with constipation are more prone to psychological distress and poorer HRQoL than those without constipation.

Correspondence: Dr. A. C. Jemilohun, Department of Internal Medicine, Benjamin Carson Snr. School of Medicine, Babcock University, Illisan-Remo, Ogun State, Nigeria. E-mail: chrislohun2010@hotmail.com.

Keywords: *Functional constipation, Irritable bowel syndrome, Opioid induced constipation, chronic constipation*

Résumé

Contexte : L'itération Rome IV identifie trois sous-types de constipation associés à l'axe cerveau-intestin : la constipation fonctionnelle (CF), le syndrome du côlon irritable avec constipation (SCI-C) et la constipation induite par les opioïdes (CIO). Cette étude a été menée pour déterminer la prévalence, les caractéristiques psychosociales et la qualité de vie liée à la santé des personnes souffrant de constipation chronique liée à l'axe cerveau-intestin dans une communauté nigériane.

Méthodologie : Dans une étude transversale, nous avons obtenu des données de 515 adultes dans une communauté nigériane avec un instrument composé du questionnaire Rome IV Functional Bowel Disorder, les Becks Depression and Anxiety Inventories, le Short Form 12, version 2 Health Survey (SF -12v2) questionnaire et autres informations pertinentes. Les données ont été analysées avec des instruments statistiques appropriés et résumées.

Résultats : Au total, 505 participants ont été inclus dans l'analyse des données. L'âge moyen de l'échantillon était de 32,7 ± 12,9 ans. Il y avait 15 participants [3,0 % (IC à 95 %, 1,6 % - 4,8 %)] avec constipation selon les critères de Rome IV : 8 [1,6 % (IC à 95 %, 0,6 % - 2,8 %)] avaient une CF, 3 [0,6 % (IC à 95 %, 0,0 % - 1,4 %)] avaient une CIO et 4 [0,8 % (IC à 95 %, 0,2 % - 1,8 %)] avaient un SII-C. Les scores moyens d'anxiété (15,1 ± 10,7, contre 8,4 ± 8,1, P = 0,030) et de dépression (17,0 ± 12,5 contre 8,1 ± 9,4, P = < 0,001) des participants souffrant de constipation étaient plus élevés que ceux sans constipation. Les participants souffrant de constipation avaient des scores moyens plus faibles dans la plupart des échelles SF12v2 avec une

association significative dans le fonctionnement physique ($p < 0,001$) Rôle physique ($p < 0,001$), la douleur corporelle ($p = 0,010$) et le rôle émotionnel ($p < 0,001$).
Conclusion : Les personnes souffrant de constipation sont plus sujettes à la détresse psychologique et à une QVLS plus faible que celles qui ne sont pas constipées.

Mots clés : *Constipation fonctionnelle, Syndrome du côlon irritable, Constipation induite par les opioïdes, Constipation chronique*

Introduction

The definition of constipation varies depending on the individual or the entity concerned. To the layman, constipation could imply straining at defecation, difûculty in passing stool, hard stool, infrequent bowel movements, discomfort with defecation or a feeling of incomplete evacuation [1]. Only a minority of cases of constipation have identified organic etiologies, the majority are idiopathic or unexplained [2]. These cases are attributable to functional disorders without any underlying structural abnormality that could explain the symptoms [2,3].

According to the Rome functional gastrointestinal disorders consensus, functional constipation (FC) is defined as a functional bowel disorder in which symptoms of difficult, infrequent, or incomplete defecation predominate [4]. FC is similar to irritable bowel syndrome with constipation (IBS-C) in some ways but patients with FC should ordinarily not meet the criteria for irritable bowel syndrome (IBS). Though abdominal pain and/or bloating may be present, they are not the predominant symptoms. Symptom onset must occur at least 6 months before diagnosis, and symptoms must be present during the last 3 months [4].

In the Rome IV iteration, another entity named opioid-induced constipation (OIC) was introduced to distinguish constipation in persons on opioids from FC [4]. Although this entity is also a disorder of brain-gut interaction, it is not functional because a definite etiology can be identified, the elimination of which results in the resolution of symptoms. Therefore, the total number of persons with brain-gut axis related chronic constipation in a given population consists of the summation of individuals with FC, IBS-C and OIC.

Generally, few studies have evaluated the prevalence of FC [5]. Most available studies assessed the prevalence of chronic constipation without regard to the type. It has been observed that self-report rates of constipation are usually higher compared with constipation diagnosed with the Rome criteria [5,6] Garrigues et al. evaluated the prevalence of constipation in the same individuals with three different diagnostic criteria and observed significant differences in the prevalence rates: 29.5% for self-report, 19.2% for Rome I criteria and 14% for Rome II criteria [6]. A community study that utilized modified Rome II criteria obtained a 12-year cumulative incidence of constipation of 17.4% [7]. Higgins and Johnson in a systematic review of epidemiological studies of constipation in North America observed various prevalence rates from as low as 1.9% to as high as 27.2%, though most of the studies included reported rates between 12% and 19% [8]. Another systematic review showed that prevalence rates of constipation in Europe and Oceania ranged widely from as low as 0.7% to as high as 81%, with a mean value of 17.1 % and 15.3% respectively in Europe and Oceania [2]. The prevalence rates in these two regions were generally similar to values obtained in North America [2].

A variety of risk factors have been identified as predisposing to FC. Though there is a paucity of data to support direct genetic cause, there is some evidence to suggest that constipation shows familial clustering [9,10]. Lifestyle factors in childhood such as low fiber intake, low fluid intake, and ignoring the call to stool could play a role in the development of constipation [11–15]. However, lifestyle factors like high fiber intake and regular exercise are associated with reduced risk of constipation [16–19]. No definite psychological feature or personality is associated with constipation, though constipation reporting, stool output, and gut dysmotility may be affected by personality, stress, and early toilet training [5,20]. However, persons with severe constipation and normal intestinal transit may have increased psychological distress as compared to those with slow transit constipation, and depressed patients may have constipation [20,21].

The high prevalence rate, the healthcare cost and the adverse effect on the quality of life of the sufferers make constipation a huge socio-economic burden on both the individual and the society [3,22-24]. Functional constipation results in 2.5 million of physician visits and an overall health care cost of $2,752 per patient treated per annum in the United States alone [25,26].

The prevalence of chronic constipation has been largely unstudied in the Nigerian adult population. A systematic review reported that majority of the available idiopathic chronic constipation studies were

conducted in North America or Northern Europe; there were no identified studies conducted in South Asia, Africa, or Central America; and only a few studies were from South America, East Asia, South-East Asia and the Middle East [27]. We conducted this study in view of the paucity of data on the prevalence, psychosocial characteristics and health-related quality of life of persons with chronic constipation in Nigeria and the sub-Saharan African population.

Materials and methods

Study design and population

This study is part of a larger study, the detailed design of which has been described somewhere else [28]. It is a community-based cross-sectional study. The study population comprised of a cohort of consenting adults aged 18 to 70 years who reside in Ilisan-Remo, Ogun State, Nigeria. The community, which hosts the Babcock University and Babcock University Teaching Hospital, has a population that is a little above 10,000 people.

We selected 10 streets out of the 51 major streets in Ilisan-Remo township at random by ballot. Two more streets were later selected to complete the sample size. Well-trained research assistants interviewed the prospective participants living in the households on each of the selected streets until the sample size was completed. Persons with a recent history of abdominal surgery, confirmed diabetes mellitus, history of significant weight loss, bloody stool, prolonged fever and pregnant women were excluded from the study.

Data collection

We obtained data from the participants with a composite questionnaire comprising of demographic information, lifestyle factors, history of opioid use, the Rome IV Functional Bowel Disorder questionnaire, other relevant investigative instruments and waist circumference. For easy assessment of stool form, a copy of the Bristol Stool Form Scale (BSFS) was shown to each participant.

Demographic information

We obtained information about age, gender, educational attainment, and marital status.

Lifestyle factors

We asked lifestyle-related questions such as cigarette smoking, alcohol intake, coffee consumption and regularity of physical exercise.

Functional Constipation

We evaluated functional constipation with the Rome IV functional constipation criteria [4].

Subject must have two or more of the following symptoms for at least 3 months with onset at least 6 months prior diagnosis:

i. Straining during at least 50% of defecations
ii. Lumpy or hard stools (BSFS 1-2) at least 50% of defecations
iii. Sensation of incomplete evacuation at least 50% of defecations
iv. Sensation of ano-rectal obstruction/blockage at least 40% of defecations
v. Manual maneuvers to facilitate at least 20% of defecations (e.g. digital evacuation, support of the pelvic floor)
vi. Fewer than 3 spontaneous bowel movements per week at least 40% of weeks

Additional features:

i. Loose stools are rarely present without the use of laxatives 20% or less of stools
ii. Insufficient criteria for IBS and OIC. Rome IV recommends the stated values for research purposes but recommends a threshold of 25% in all the criteria for use in clinical settings.

Also, we evaluated two less stringent definitions of constipation which included:

i. Rome IV Functional Constipation without the 6-month requirement and
ii. "Any constipation" which implied having at least one of the FC symptoms listed above irrespective of the frequency of symptoms for at least 3 months

Opioid-induced constipation

We diagnosed OIC with the Rome IV functional constipation criteria [4]. The criteria include:

1. New or deteriorating symptoms of constipation when initiating, changing, or increasing opioid therapy that must be associated with two or more of the following:

i. Straining during at least 50% of defecations
ii. Lump or hard stools (BSFS 1-2) at least 50% of defecations
iii. Sensation of incomplete evacuation at least 50% of defecations
iv. Sensation of ano-rectal obstruction/blockade at least 40% of defecations
v. Manual maneuvers to facilitate at least 20% of defecations (e.g. digital evacuation, support of the pelvic floor)
vi. Fewer than 3 spontaneous bowel movements per week at least 40% of weeks

2. Loose stools are rarely present without the use of laxatives 20% or less of stools

Irritable Bowel Syndrome with constipation

We assessed IBS with the Rome IV FBD modular questionnaire* [4]. The criteria include:

Repeated abdominal pain occurring at least 1 day per week in the last 3 months which must have occurred at least 6 months prior to diagnosis, associated with 2 or more of the following criteria:

1. Related to defecation
2. Associated with a change in frequency of stool
3. Associated with a change in form (appearance) of stool

*IBS-constipation predominant: abnormal stools are usually constipation (BSFS type 1-2)

Psychological Characteristics (Anxiety and Depression)

We assessed anxiety and depression in the subjects with the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI-II) respectively.

Beck's Anxiety Inventory

Beck et al. designed the Beck Anxiety Inventory (BAI) in 1988 as a screening tool for anxiety [29]. The instrument is a 21-item self-report inventory with statements descriptive of anxiety symptoms subjects experienced during the past 4 weeks of their lives, rated on a Likert scale of 4 points. The possible range of total scores goes from 0 to 63. The instrument has been validated by several studies and found to be a reliable measure of anxiety symptoms in different populations [30–35].

Beck's Depression Inventory

Beck et al. designed the Beck Depression Inventory (BDI) in 1961 as a tool for assessing the severity of depression [36]. It is a 21-question multiple-choice self-report inventory with a score range of 0-63. The inventory has a 2-week recall. Since creation, it has undergone two revisions: the BDI- the original version was published in 1961; the BDI- 1A, the first revision in 1978; and the BDI-II, second revision in 1996.

Health-related Quality of Life

The health-related quality of life (HRQoL) of the participants was assessed with the Short Form-12, version 2 (SF-12v2). The SF-12v2 is a generic 12-item self-reported HRQoL which score patient on a graduated scale based of a 4-week recall. The instrument generates the Physical Component Summary (PCS12) and the Mental Component Summary (MCS12) of patients' HRQoL [37,38] as well as patients' profile across 8 subscales: Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP) General Health (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE), Mental Health (ME). While the PCS12 focuses on participants' general overall health, limitations in mobility, work, and other physical activities as well as limitations due to pain; the MCS12 involves participants' limitations in social activity, emotional state, and level of distraction.

The PCS12 and the MCS12 measure the latent concepts of physical and mental HRQoL respectively. Each of the components are scored on a scale from 0 to 100 with a mean of 50 and a standard deviation of 10, where the higher scores represent better health. While the PCS12 focuses on participants' general overall health, limitations in mobility, work, and other physical activities as well as limitations due to pain; the MCS12 involves participants' limitations in social activity, emotional state, and level of distraction.

Waist circumference

We measured the abdominal circumference (in centimeter) of all the subjects with a flexible tape rule at the level of the umbilicus to quantify abdominal obesity.

Statistical analysis

We analysed data with IBM-Statistical Package for Social Sciences (SPSS), version 22. Categorical variables were expressed as frequencies and percentages. Differences between categorical variables were compared by Pearson Chi-square test or Fisher exact test as appropriate. We presented continuous variables as Mean ± Standard deviation (SD). Means of continuous variables were compared by Independent Student t-test or analysis of variance (ANOVA) as appropriate. For ANOVA, Turkey post-hoc test was conducted to determine the significance of intergroup variability. Variables with p-value ≤ 0.05 were considered significant.

Ethical consideration

We obtained ethical approval from the Babcock University Ethics Review Board (BUHREC044/19). Written informed consent was also obtained from each of the study participants.

Results

We interviewed 515 persons but 10 of them were excluded from the data analysis because of incomplete data, leaving 505 (98.1%) in the final analysis. The sample mean age was 32.7 ±12.9 years

[Table 1]. There were slightly more females (51.5%) than males (48.5%) participants. There were more unmarried participants [284 (56.2%)] than the married. Concerning educational attainment, 448 (88.4%) had at least secondary education, while the other had primary or no formal education. These differences were not statistically significant.

without statistical significance (p = 0.198) [Table 1]. When the 6 months requirement was waived, the number of participants with FC increased to 19 [3.8% (95% CI, 2.2% - 5.5%)]. Also, 215 participants [42.6% (95% CI, 37.8% - 47.0%)] had at least two constipation symptoms regardless of the frequency.

Table 1: Sociodemographic and Psychological Characteristics of Participants (n = 505)

Variables	Total	All C	P	FC	P	IBS-C	P	OIC	P
Age [Mean± SD]	32.7 ± 12.9	36.1±12.5	0.301	38.6 ±12.4	0.194	40.8±12.3	0.213	23.3±4.7	0.207
Gender [n (%)]			0.153		0.493		0.359		0.613
Male	245 (48.5)	10 (66.7)		5 (62.5)		3 (75.0)		2 (66.7)	
Female	260 (51.5)	5 (33.3)		3 (37.5)		1 (25.0)		1 (33.3)	
Marital Status									
[n (%)]			0.198		0.146		0.323		0.260
Unmarried	284 (56.2)	6 (40.0)		2 (25.0)		1 (25.0)		3 (100.0)	
Married	221 (43.8)	9 (60.0)		6 (75.0)		3 (75.0)		0 (0.0)	
Education [n (%)]			0.692		0.783		0.115		1.000
Nil/Primary	57 (11.3)	2 (13.3)		0 (0.0)		2 (50.0)		0 (0.0)	
Secondary	198 (39.2)	7 (46.7)		5 (62.5)		1 (25.0)		1 (33.3)	
Tertiary	250 (49.5)	6 (40.0)		3 (37.5)		1 (25.0)		2 (66.7)	
Waist circumference	82.0 ±14.6	88.4±9.5	0.087	89.0±10.9	0.175	89.0±10.2	0.262	86.0±7.2	0.639
Physical Exercise									
[n (%)]			0.485		0.362		1.000		0.430
No or < once a week	419 (83.0)	14 (93.3)		8 (100.0)		4 (100)		2 (66.7)	
≥ once a week	861 (17.0)	1 (6.7)		0 (0.0)		0 (0.0)		1 (33.3)	
Cigarette smoking									
[n (%)]			1.000		1.000		0.342		1.000
No	455 (90.1)	14 (93.3)		8 (100.0)		3 (75.0)		3 (100.0)	
Yes	50 (9.9)	1 (6.7)		0 (0.0)		1 (25.0)		0 (0.0)	
Alcohol intake									
[n (%)]			0.377		0.690		0.305		1.000
No	366 (27.5)	9 (60.0)		5 (62.5)		2 (50.0)		2 (66.7)	
Yes	139 (72.5)	6 (40.0)		3 (37.5)		2 (50.0)		1 (33.3)	
Coffee intake									
[n (%)]			0.379		0.692		1.000		0.021
No	364 (72.1)	9 (60.0)		5 (62.5)		3 (75.0)		0 (0.0)	
Yes	141 (27.9)	6 (30.0)		3 (37.5)		1 (25.0)		3 (100.0)	
Anxiety									
[Mean± SD]	8.6±8.2	15.1±10.7	0.030	11.6±8.2	0.286	20.0±13.6	0.005	17.7±13.6	0.054
Depression									
[Mean± SD]	8.3±9.6	17.0±12.5	<0.001	13.5±13.0	0.124	22.2±9.5	0.003	19.3±16.5	0.046
Total	505	15 (3.0)		7 (1.4%)		4 (0.8%)		3 (0.6)	

P, P-value; IBS, irritable bowel syndrome; FC, functional constipation; IBS-C, irritable bowel syndrome with constipation; OIC, opioid induced constipation; All C, all participants with any constipation.

We found 8 participants [1.6% (95% CI, 0.6% - 2.8%)] who had FC, 3 [0.6% (95% CI, 0.0% - 1.4%)] had OIC and 4 [0.8% (95% CI, 0.2% - 1.8%)] had IBS-C [Table 1]. The total number of participants with any of the three types of constipation by the Rome IV diagnostic criteria was 15 [3.0% (95% CI, 1.6% - 4.8%)]. The mean age of those with chronic constipation was higher than those without constipation (controls) (36.1±12.5 years vs 32.6±12.9 years), though without statistical significance (p = 0.301). More men had constipation than women with a Male/Female ratio of 2:1, also

Psychosocial factors

The mean anxiety (15.1±10.7, vs 8.4±8.1, p = 0.030) and depression (17.0±12.5 vs 8.1±9.4, p < 0.001) scores of all participants with constipation (without regard for subtype) was higher than the controls [Table 1]. When the constipation subtypes were considered separately, they all had higher mean anxiety and depression scores than the controls, though FC had no significant statistical association with either anxiety or depression. IBS-C had a significant association with anxiety (p = 0.005) and depression (p

= 0.003) while OIC had a significant association with depression (p = 0.046) [Table 1]. Of all the lifestyle factors considered, only OIC had a significant association with coffee intake (p = 0.021).

Health-related quality of life (SF12v2)

Participants with FC and OIC had lower mean scores compared to the controls in all the subscales except Vitality and Mental Health while participants with IBS-C had lower mean scores than the controls in all the subscales except Vitality. The levels of significance of the associations are as follows:

General health, vitality, social functioning and mental health

There were no statistically significant differences (p > 0.05) between the controls, FC, IBS-C and IOC during analysis [Table 2].

Physical functioning

There was a statistically significant difference between the groups (p < 0.001). Participants with IBS-C had a significantly lower mean score than the controls (18.8±23.9 vs 74.0±31.3, p = 0.003). Participants with OIC also had a significantly lower mean score than the controls (16.7±14.4 vs 74.0±31.3, p = 0.009).

Role physical

There was a statistically significant difference between the groups (p <0.001). Participants with OIC had a significantly lower mean score than the controls (12.5±15.5 vs 74.8±29.6, p = 0.002). Participants with OIC also had a significantly lower mean score than the participants with FC (12.5±12.5 vs 67.2±24.9, p = 0.032).

Table 2: Health-related Quality of Life in Participants (n = 505)

	No-C	FC	IBS-C	OIC	P-value	Turkey HSD
PF	74.0±31.3	50.0±44.3	18.8±23.9	16.7±14.4	<0.001	No-C vs IBS-C (0.003) No-C vs OIC (0.009)
RP	74.8±29.6	67.2±24.9	37.5±14.4	12.5±12.5	<0.001	No-C vs OIC (0.002) FC vs OIC (0.032)
BP	76.4±24.5	59.4±32.6	50.0±20.4	50.0±25.0	0.010	
GH	85.1±15.3	78.4±24.0	72.5±14.4	70.0±38.3	0.097	
VT	57.8±35.7	62.5±18.9*	75.0±20.4*	66.7±38.2*	0.741	
SF	70.0±30.0	56.3±37.2	56.3±42.7	66.7±28.9	0.483	
RE	75.6±29.1	68.8±25.0	37.5±17.7	8.3±7.2	<0.001	No-C vs IBS-C (0.044) No-C vs OIC (<0.001) FC vs OIC (0.009)
MH	64.5±19.5	65.6±22.9*	56.3±7.2	70.8±19.0*	0.787	
PCS	50.5±7.5	43.5±9.4	37.3±5.4	34.4±1.8	<0.001	No-C vs FC (0.045) No-C vs IBS-C (0.003) No-C vs OIC (0.001)
MCS	46.2±8.9	47.4±10.1	44.2±5.4	43.6±2.5	0.898	

**Higher mean score than controls; No-C, No constipation; FC, functional constipation; IBS-C, irritable bowel syndrome with constipation; OIC, opioid induced constipation; PF, Physical Functioning; RP, Role Physical; BP, Bodily Pain; GH, General Health; VT, Vitality; SF, Social Functioning; RE, Role Emotional; PCS, Physical Component Summary; MCS, Mental Component Summary*

Bodily pain

There was a statistically significant difference between the groups (p = 0.010) [Table 2].

Role emotional

There was a statistically significant difference between the groups (p < 0.001) [Table 2]. Participants with IBS-C had a significantly lower mean score than the control (37.5±17.7 vs 75.6±29.1, p = 0.044). Participants with OIC had a significantly lower mean score than the controls (29.1±8.3 vs 75.6±29.1, p <0.001). Participants with OIC also had a significantly lower mean score than participants with FC (29.1±8.3 vs 68.8±25.0, p = 0.009).

Physical component summary

There was a statistically significant difference between the groups (p < 0.001) and all the constipation

sub-types had significantly lower mean scores than the controls (p d" 0.05) [Table 2].

Mental component summary

There was no statistically significant difference between the groups, though FC and OIC had lower mean scores than the controls.

In general, OIC had the worst HRQoL mean scores, followed by IBS-C and FC respectively [Figure 1].

soups made of leafy vegetables, a combination which forms bulk that passes through the gut with relative ease. Therefore, the observed low prevalence of chronic constipation in our study population may be due to the consumption of the Nigerian traditional higher fiber diet.

FC was more commonly reported than IBS-C in our study population (1.6% vs 0.8%) when defined strictly by the Rome IV criteria. Since FC is

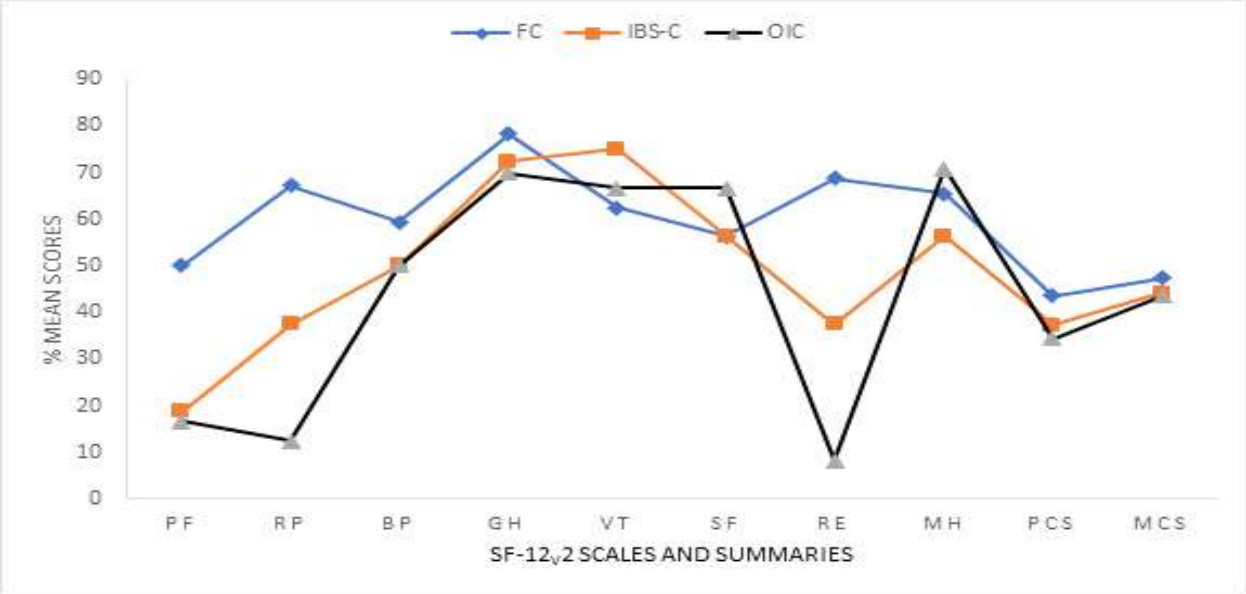

Fig. 1: SF-12v2 scales and summaries mean scores (n = 505)
PF, Physical Functioning; RP, Role Physical; BP, Bodily Pain; GH, General Health; VT, Vitality; SF, Social Functioning; RE, Role Emotional; PCS, Physical Component Summary; MCS, Mental Component Summary

Discussion

The prevalence of chronic constipation varies widely in the community from as low as 1.9% to as high as 40.1% depending on the population and the type of survey instrument used [5].

The prevalence of chronic constipation and the sub-types by the Rome IV criteria can be said to be low in our study population, though the symptoms of constipation are reasonably common with close to half of the population (42.6%) experiencing at least 2 of 6 constipation symptoms in the last 3 months, in tandem with the findings of previous similar studies [39,40]. It has been established that increased dietary fiber reduces the risk of constipation [16,17] because it increases fecal weight, reduces colonic transit time and increases stool frequency [22]. The traditional staples in Nigeria include whole grains like guinea corn, millet, maize, cowpea and tubers like cassava, yam, cocoyam and their semi-processed products which are rich in fiber and complex carbohydrate. Most often than not, these staples are consumed with a disease entity while IBS-C is a subtype of another disease entity (IBS), it is expected that the former would be commoner in the population than the latter. This observation is in tandem with the finding of previous studies that reported a higher prevalence of FC than IBS-C in their study populations [39,40]

We found a higher prevalence of constipation among the male participants than the female participants. The majority of studies have reported a higher prevalence of chronic constipation in females than males in the adult population [2,8,41], though some have reported equal gender prevalence [42-44] or higher prevalence in males [45]. The reason for the higher male preponderance of constipation in our study is not immediately clear but it may be due to the differences in gender-related illness perception and health-seeking behavior in the study population. Since women generally have better health-seeking behavior than men [46], those who have sought medical attention for constipation among them may have had symptoms amelioration, making them not to fulfill the Rome IV diagnostic criteria.

It has been reported that persons with severe constipation and normal intestinal transit may have increased psychological distress compared to those with slow transit constipation, and depressed patients could have constipation [5,21]. Cheng et al. previously reported higher anxiety and depression scores in patients with idiopathic constipation [43]. Our study demonstrated that persons with constipation are more prone to anxiety and depression than those who are not constipated, although this association does not necessarily imply causality. Patients with constipation could develop anxiety and depression because of their condition, it is also possible that depression and anxiety could predispose to constipation.

Our study showed that persons with constipation have poorer HRQoL compared to those who do not have constipation. It has been demonstrated beyond doubt that patients with chronic constipation have poorer quality of life compared with healthy subjects [3,22,23,40,4748]. Patients with FC have been observed to experience a reduced quality of life similar to those with chronic diseases like rheumatoid arthritis, chronic allergy, inflammatory bowel disease and diabetes [49]. Due to the high tendency of physicians to minimize the importance of FGIDs, patients' concerns about their ailments are often not inadequately addressed. Many of the patients have little or no understanding of their condition and suffer in silence. They tend to be fearful that their symptoms could be related to a life-threatening condition, and are frustrated because of lack of effective therapies. Therefore, physicians need to pay adequate attention to the mental health status and the HRQoL of patients with chronic constipation to provide holistic personalized care for them.

The strength of this study is in the fact that it provides the first community-based data on the Rome IV classification of chronic constipation subtypes in a Nigerian adult population. The limitation of the study lies in the fact that we were unable to conduct a logistic regression to eliminate the effect of confounders because of the small number of participants who were positive for each of the constipation subtypes.

Conclusion

The prevalence rates of chronic constipation and the subtypes by Rome IV criteria are low in our study population, though the symptoms of constipation are quite common among them. Persons with constipation are more prone to psychological distress and poorer HRQoL than those without constipation.

References

1. Wald A, Scarpignato C, Mueller-Lissner S, *et al*. A multinational survey of prevalence and patterns of laxative use among adults with self-defined constipation. Aliment Pharmacol Ther. 2008;28:917–930.
2. Peppas G, Alexiou VG, Mourtzoukou E and Falagas ME. Epidemiology of constipation in Europe and Oceania: a systematic review. BMC Gastroenterol. 2008;8:5.
3. Sanchez MIP and Bercik P. Epidemiology and burden of chronic constipation. Can J Gastroenterol. 2011;25 (Suppl B):11B-15B.
4. Whitehead WE, Drossman DA, Chang L, *et al*. Diagnostic Questionnaires and Tables for Investigators and Clinicians. 1st ed. Rome Foundation, Raleigh, North Carolina; 2017.
5. Lacy BE, Mearin F, Chang L, *et al*. Bowel Disorders. Gastroenterology. 2016;150:1393-1407.
6. Garrigues V, Gálvez C, Ortiz V, *et al*. Prevalence of constipation: agreement among several criteria and evaluation of the diagnostic accuracy of qualifying symptoms and self-reported definition in a population-based survey in Spain. Am J Epidemiol. 2004;159:520–526.
7. Choung RS, Locke III GR, Schleck CD, Zinsmeister AR and Talley NJ. Cumulative incidence of chronic constipation: a population-based study 1988-2003. Aliment Pharmacol Ther. 2007;26:1521–1528.
8. Higgins PDR and Johanson JF. Epidemiology of constipation in North America: a systematic review. Am J Gastroenterol. 2004;99:750–759.
9. Ostwani W, Dolan J and Elitsur Y. Familial Clustering of Habitual Constipation: A Prospective Study in Children From West Virginia. J Pediatr Gastroenterol Nutr. 2010;50:287–289.
10. Chan AOO, Lam KF, Hui WM, *et al*. Influence of Positive Family History on Clinical Characteristics of Functional Constipation. Clin Gastroenterol Hepatol. 2007;5:197–200.
11. Kocaay P, Egritas O and Dalgiç B. Normal defecation pattern, frequency of constipation and factors related to constipation in Turkish children 0-6 years old. Turk J Gastroenterol. 2011;22:369-375
12. Ip KS, Lee WTK, Chan JSH and Young BWY. A community-based study of the prevalence of constipation in young children and the role of dietary fibre. Hong Kong Med J. 2005;11:431–436.
13. Chan MF and Chan YL. Investigating factors associated with functional constipation of primary

school children in Hong Kong. J Clin Nurs. 2010;19:3390–3400.
14. Chung JM, Lee SD, Kang DI, *et al*. An Epidemiologic Study of Voiding and Bowel Habits in Korean Children: A Nationwide Multicenter Study. Urology. 2010;76:215–219.
15. Wald ER, Di Lorenzo C, Cipriani L, *et al*. Bowel habits and toilet training in a diverse population of children. J Pediatr Gastroenterol Nutr. 2009;48:294–298.
16. Dukas L, Willett WC and Giovannucci EL. Association between physical activity, fiber intake, and other lifestyle variables and constipation in a study of women. Am J Gastroenterol. 2003;98:1790–1796.
17. Murakami K, Sasaki S, Okubo H, *et al*. Association between dietary fiber, water and magnesium intake and functional constipation among young Japanese women. Eur J Clin Nutr. 2006;61:616–622.
18. Nakaji S, Tokunaga S, Sakamoto J, *et al*. Relationship between lifestyle factors and defecation in a Japanese population. Eur J Nutr. 2002 1;41:244–248.
19. Daley A, Grimmett C, Roberts L, *et al*. The Effects of Exercise upon Symptoms and Quality of Life in Patients Diagnosed with Irritable Bowel Syndrome: A Randomised Controlled Trial. Int J Sports Med. 2008;29:778–782.
20. Wald A, Hinds JP and Caruana BJ. Psychological and Physiological Characteristics of Patients With Severe Idiopathic Constipation. Gastroenterology. 1989;97:932-937.
21. Longstreth GF, Thompson WG, Chey WD, *et al*. Functional Bowel Disorders. Gastroenterology. 2006;130:1480–1491.
22. Talley NJ. Definitions, epidemiology, and impact of chronic constipation. Rev Gastroenterol Disord. 2004;4 (Suppl 2):S3–10.
23. Dennison C, Prasad M, Lloyd A, *et al*. Bhattacharyya SK, Dhawan R, Coyne K. The health-related quality of life and economic burden of constipation. PharmacoEconomics. 2005;23:461–476.
24. Daniyam CA, Malu AO, Okeke EN and Lawal OO. Bowel habits of urban and rural populations on the Jos, Plateau, Nigeria. West Afr J Med. 2011;30:182–187.
25. Rantis PC, Vernava AM, Daniel GL and Longo WE. Chronic constipation—is the work-up worth the cost? Dis Colon Rectum. 1997;40:280–286.
26. Sonnenberg A and Koch TR. Physician visits in the United States for constipation: 1958 to 1986. Dig Dis Sci. 1989;34:606–611.
27. Suares NC and Ford AC. Prevalence of, and risk factors for, chronic idiopathic constipation in the community: systematic review and meta-analysis. Am J Gastroenterol. 2011;106:1582–1591.
28. Jemilohun AC, Akande KO, Adeleye OO, *et al*. Functional Bowel Disorders, Psychosocial Correlates and Health-related Quality of Life in a Nigerian Community: Ilisan-Remo Functional Bowel Disorders Project Protocol. Int Res J Gastroenterol Hepatol. 2020;10:1–9.
29. Beck AT, Epstein N, Brown G and Steer RA. An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol. 1988;56:893–897.
30. Leyfer OT, Ruberg JL and Woodruff-Borden J. Examination of the utility of the Beck Anxiety Inventory and its factors as a screener for anxiety disorders. J Anxiety Disord. 2006;20:444–458.
31. Osman A, Hoffman J, Barrios FX, *et al*. Factor structure, reliability, and validity of the Beck Anxiety Inventory in adolescent psychiatric inpatients. J Clin Psychol. 2002;58:443–456.
32. Muntingh ADT, van der Feltz-Cornelis CM, van Marwijk HWJ, *et al*. Is the Beck Anxiety Inventory a good tool to assess the severity of anxiety? A primary care study in the Netherlands Study of Depression and Anxiety (NESDA). BMC Fam Pract. 2011;12:66.
33. Wetherell JL and Areán PA. Psychometric evaluation of the Beck Anxiety Inventory with older medical patients. Psychol Assess. 1997;9:136–144.
34. Quintão S, Delgado AR and Prieto G. Validity study of the Beck Anxiety Inventory (Portuguese version) by the Rasch Rating Scale model. Psicol Reflex E Crítica. 2013;26:305–310.
35. Nordberg SS, Moltu C and Råbu M. Norwegian translation and validation of a routine outcomes monitoring measure: The treatment outcome package. Nord Psychol. 2016;68:124–143.
36. Beck AT, Ward CH, Mendelson M, Mock J and Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry. 1961;4:561–571.
37. Bhandari NR, Kathe N, Hayes C and Payakachat N. Reliability and validity of SF-12v2 among adults with self-reported cancer. Res Soc Adm Pharm. 2018;14:1080–1084.
38. Hayes CJ, Bhandari NR, Kathe N and Payakachat N. Reliability and Validity of the Medical Outcomes Study Short Form-12 Version 2 (SF-12v2) in Adults with Non-Cancer Pain. Healthcare. 2017;5.

39. Wong RK, Palsson OS, Turner MJ, *et al*. Inability of the Rome III criteria to distinguish functional constipation from constipation-subtype irritable bowel syndrome. Am J Gastroenterol. 2010;105:2228–2234.
40. Koloski NA, Jones M, Young M and Talley NJ. Differentiation of functional constipation and constipation predominant irritable bowel syndrome based on Rome III criteria: a population-based study. Aliment Pharmacol Ther. 2015;41:856–866.
41. Mugie SM, Benninga MA and Di Lorenzo C. Epidemiology of constipation in children and adults: a systematic review. Best Pract Res Clin Gastroenterol. 2011;25:3–18.
42. Chang JY, Locke GR, Schleck CD, Zinsmeister AR and Talley NJ. Risk factors for chronic constipation and a possible role of analgesics. Neurogastroenterol Motil. 2007;19:905–911.
43. Cheng C, Chan AOO, Hui WM and Lam SK. Coping strategies, illness perception, anxiety and depression of patients with idiopathic constipation: a population-based study. Aliment Pharmacol Ther. 2003;18:319–326.
44. Whitehead WE, Drinkwater D, Cheskin LJ, Heller BR and Schuster MM. Constipation in the elderly living at home. Definition, prevalence, and relationship to lifestyle and health status. J Am Geriatr Soc. 1989;37:423–429.
45. Texereau P and Liversain Jm. Epidemiology of intestinal functional disorders. Presse Medicale. 1989;18:1281–1284.
46. Thompson AE, Anisimowicz Y, Miedema B, *et al*. The influence of gender and other patient characteristics on health care-seeking behaviour: a QUALICOPC study. BMC Fam Pract. 2016;17.
47. Ruiz-López MC and Coss-Adame E. Quality of life in patients with different constipation subtypes based on the Rome III criteria. Rev Gastroenterol Mex. 2015;80:13–20.
48. Bharucha AE, Pemberton JH and Locke GR. American Gastroenterological Association technical review on constipation. Gastroenterology. 2013;144:218–238.
49. Sun SX, Dibonaventura M, Purayidathil FW, *et al*. Impact of chronic constipation on health-related quality of life, work productivity, and healthcare resource use: an analysis of the National Health and Wellness Survey. Dig Dis Sci. 2011;56:2688–2695.

Received = 07/06/2021
Accepted = 13/08/2021