

Association Between Irritable Bowel Syndrome and Shift Work: Prevalence and Associated Factors Among Nurses

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ABSTRACT

AIM: Irritable Bowel Syndrome (IBS) is commonly seen in the general population. Mechanisms proposed as the underlying pathogenesis include visceral hypersensitivity, alteration in bowel motility, psychological status and abnormal intestinal barrier. It has been observed that circadian rhythms and sleep are altered by shift work, which may ultimately increase stress and worsen health problems. The aim was to determine the prevalence of IBS among nurses and evaluate the relationship between shift work and IBS.

METHOD: One hundred and twenty four nurses at different cadres volunteered to take part in the study. Questionnaires were administered to collect demographic data and all the subjects also completed the IBS module from Rome III diagnostic questionnaire.

RESULTS: A total of 124 female nurses participated in the study. The mean age was 38.5 ± 7.7 years with a range between 21 and 57 years. Using Rome III criteria, irritable bowel syndrome was observed in 56 (45.2%) of the subjects. According to subtypes, diarrhoea predominant IBS (IBS-D) was observed in 30.4%, constipation predominant (IBS-C) was observed in 8.9%, while mixed subtype (IBS-M) was seen in 60.7% of the subjects. Using logistic regression analysis; age group 20-29 years, length of practice

less than five years, multiple qualifications and involvement in shift duty have the highest risk of developing IBS.

CONCLUSION: Rotating shift work could increase the risk of developing IBS and as such, individuals with IBS or other gastrointestinal symptoms should be educated on the possible negative effect of their work schedule on such symptoms or disorder.

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Key words: Irritable Bowel Syndrome; Shift Work; Nurses

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INTRODUCTION

Irritable Bowel Syndrome (IBS) is one of the functional gastrointestinal disorders commonly seen in the general population^[1]. It is characterized by recurrent abdominal pain associated with alteration in bowel habits, diarrhoea and/or constipation and bloating^[2]. Based on these symptoms, three subgroups have been differentiated: constipation-predominant (IBS-C), diarrhoea-predominant (IBS-D) and those with alternating bowel movements^[3].

The prevalence of IBS in the general population in the western countries is 15-24% independent of age and ethnicity, and the male to female ratio is 1:1.5^[4,5]. However, a lower prevalence of 5-10% has been found in Asian countries^[6] while studies from Africa have reported prevalence of between 8-30%^[7-9].

The precise aetiology of this condition is yet to be established but, several mechanisms have been proposed as the underlying pathogenesis and these include visceral hypersensitivity, alteration in bowel motility, psychological status and abnormal intestinal barrier^[10-12]. Psychological distress and stressful life events have been found to influence clinical presentation and outcomes of IBS^[13,14].

It has been observed that circadian rhythms and sleep are altered by shift work, which may ultimately increase stress and worsen health problems^[15].

The aim of this study was to determine the prevalence of IBS among nurses working at a tertiary health facility and evaluate the relationship between shift work and IBS.

METHODS

Nurses at different cadres who are involved in patients' care at the University College Hospital, Ibadan were asked to participate in the study of which, 124 volunteered to take part. After obtaining an informed consent from each participant, questionnaires were administered. The questionnaire contains information such as age, level of education, qualification, rank, length of practice, participation in night duties, duration and frequency of night shift.

All the subjects also completed the IBS module from Rome III diagnostic questionnaire which is available at <http://www.romecriteria.org/questionnaires/>. This survey, which had been validated was used to identify those with IBS and to classify the subjects into IBS-C, IBS-D, IBS-M subtypes.

The data were analyzed using SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc. Values were expressed as means±SD. Logistic regression was used to evaluate the association between IBS and certain factors. *P* value of less than 0.05 was considered significant.

RESULTS

A total of 124 female nurses participated in the study. The mean age was 38.5±7.7 years with a range between 21 and 57 years. The predominant age groups were 30-39 years (38.7%) and 40-49 years (37.9%). With respect to qualifications, 44 (35.5%) had two qualifications which are Registered Nurse (RN) and Registered Midwife (RM), while 24 (19.4%) had other qualifications and degrees in addition.

Concerning the ranks of the subjects, 27 (21.8%) were Nursing Officers 1 (NO 1), followed by 25 (20.2%) Senior Nursing Officers (SNO), while 21 (16.9%) were Chief Nursing Officers (CNO). The years of practice showed that 75 (60.5%) had practised for over 10 years, while 34 (27.4%) had practised for between 5-10 years (Table 1).

The results also showed that 120 (96.8%) are involved in rotational shift duties which include night shift of which, 116 (93.5%) do night shift every month. The duration of night shifts further showed that 90 (72.6%) do seven days in a month, the least being seven days every 3-4 months by 5.6% of the subjects. Sixty-two (50%) and 37 (29.8%) of the subjects have been doing night shifts for more than 10 years and between 5-10 years respectively.

Using Rome III criteria, irritable bowel syndrome was observed in 56 (45.2%) of the subjects. According to subtypes, diarrhoea predominant IBS (IBS-D) was observed in 30.4%, constipation predominant (IBS-C) was observed in 8.9%, while mixed subtype (IBS-M) was seen in 60.7% of the subjects (Figure 1).

It was observed that 44 (84.8%) of those with IBS were between 30-49 years of age while, 53 (82.9%) of those without IBS were between 30-49 years of age, but there was no significant difference between these two groups.

The results showed that 19 (44.2%) of those with IBS had two qualifications whereas, 25 (53.2%) of those without IBS had two qualifications (*p*=0.55). Association between the ranks of the subjects and the occurrence of IBS showed that 11 (21.2%) each are NOs

1 and CNOs whereas, 16 (25.4%) of those without IBS are NOs 1 while, 15 (23.8%) are Senior Nursing Officers (SNOs) (*p*=0.73) (Table 2).

With respect to the years of practice and IBS, 35 (63.6%) of those with IBS had practised for over 10 years compared to 40 (59.7%) of those without IBS. However, there was no significant difference between these two groups. It was also observed that 55 (98.2%) of those with IBS were involved in rotational shift duties compared to 65 (95.6%) of those without IBS (*p*=0.41) (Table 2).

Using logistic regression analysis; age group 20-29 years, length of practice less than five years, multiple qualifications and involvement in shift duty have the highest risk of developing IBS (Table 3).

Table 1 General Characteristics of Subjects.

Characteristic	n (%)
Age groups (years)	
20-29	11 (8.9)
30-39	48 (38.7)
40-49	47 (37.9)
50-59	9 (7.3)
Qualifications	
RN	9 (7.3)
RN, RM	44 (35.5)
RN, RM+others	24 (19.4)
Ranks	
NO	58 (46.8)
SNO	25 (20.2)
PNO	8 (6.5)
CNO	21 (16.9)
ADN	3 (2.4)
Years of Practice (years)	
Less than 5	13 (10.5)
5-10	34 (27.4)
Over 10	75 (60.5)

Table 2 Characteristics of Subjects with and without IBS.

Characteristics	IBS yes n (%)	IBS no n (%)	<i>p</i> -value
Age (years)			
30 - 49	44 (84.8)	53 (82.9)	0.76
Qualification			
Two	19 (44.2)	25 (53.2)	0.55
Rank			
NO1	11 (21.2)	NO1 16 (25.4)	0.73
CNO	11 (21.2)	SNO 15 (23.8)	0.73
Years of Practice			
Over 10	35 (63.6)	40 (59.7)	0.25
Rotational Shift Duties	55 (98.2%)	65 (95.6%)	0.41

Table 3 Logistic Regression of Variables Associated with IBS.

Variable	Odds Ratio	95% Confidence Interval	
		Lower	Upper
Age 20-29 years	2.4	0.4	14.9
Less than 5 years of practice	1.8	0.5	6.1
More than one qualification	2.2	0.6	8.9
Involvement in shift duty	2.5	0.3	25

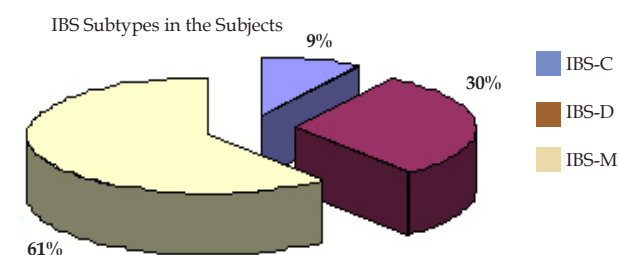


Figure 1 IBS Subtypes among the Subjects.

DISCUSSION

This study found a prevalence of 45.2% for IBS among nurses which is higher than the 32.7% reported by Kim *et al.*^[16] among nurses and nursing assistants in Korea. While the study in Korea divided the subjects into daytime and rotating shift worker groups, all the subjects in our study were rotating shift workers, and this might explain the higher prevalence recorded in this present study. However, the same Rome III criteria were used for the diagnosis of IBS in both studies.

This figure is also higher than the 32.1% reported by Okami *et al.*^[17] among Chinese nursing and medical students and the 35.5% reported by Okami *et al.*^[18] also among nursing and medical students in Japan. The lower prevalence reported in these studies might be due to the fact that these were students who were on training and whose rotating shifts were likely to be temporary and for a short duration compared to the subjects in our study who are already working and whose rotating shifts are likely to be permanent and of longer duration.

Also, in another study in China by Liu *et al.*^[19] among nurses a lower prevalence of 17.4% was reported. However, in this study; alcohol consumption, low exercise and psychological disorders were considered as risk factors for IBS not rotating shift work. The prevalence of IBS in this present study is also higher than that reported in the general population^[6-9,20].

Attempts have been made to explain the relationship between IBS and rotating shift work. One of such explanations is sleep disturbance that is observed among shift workers. Kim *et al.*^[21] observed that shift workers suffer significantly from psychological and physical stresses, as well as sleep problems more than non-shift workers and that these factors could have negative effect on the quality of life of shift workers. Although, in our study information about sleep disturbance was not obtained from the subjects, 98.2% of those with IBS were involved in rotational shift duties. It is therefore possible that some of the problems observed by Kim *et al.* in their subjects are also present in our subjects.

It has been observed in recent studies that disruption of circadian rhythm is more common in rotating shift workers which could predispose them to having subjective symptoms like; sleep disturbances, increased fatigue and anorexia as well as problems with cardiovascular and gastrointestinal systems^[21,22].

In the pathogenesis of IBS, psychological factors have been found to be of major importance, and poor sleep quality had been reported to adversely affect psychological factors in rotating shift workers^[23]. However, sleep disturbances alone will not completely explain the association between shift work and IBS. In a study by Nojkov *et al.*^[24] after controlling for sleep quality an association was still found between shift work and IBS. It may therefore, imply that the association between rotating shift work and IBS might be as a result of circadian disruption.

Clock genes have been thought to control circadian rhythms and these genes have been found within mouse epithelial cells and myenteric plexus. This suggests that these genes modulate and coordinate cell differentiation, proliferation, nociception and motility^[25-27].

In our study, mixed type IBS was found to be the most prevalent among the subjects. This is similar to the finding of Nojkov *et al.*^[24] among rotating shift nurses. The similarity of this finding may support the role of circadian rhythm in the pathogenesis of IBS in shift workers. This is suggested in a study by Rao *et al.*^[28] where it was shown that motility of the colon follows a circadian rhythm.

In our study we observed that those with less than 5 years of

practice had the highest risk of developing IBS. This is in contrast to the finding of Nojkov *et al.*^[24] where no association was found between the number of years of practice and IBS. Possible explanation for this may be because, as the number of years of practice increased the colon could adapt to changes in environmental conditions without compromising its motility.

This study has some limitations. In the first instance, none of the subjects in the study was investigated and it is possible that some of the symptoms reported by the subjects could be as a result of other conditions not necessarily due to IBS. Secondly, there were no controls for the study as this could have increased the strength of our findings.

CONCLUSION

This study suggests that rotating shift work could increase the risk of developing IBS and as such, individuals with IBS or other gastrointestinal symptoms should be educated on the possible negative effect of their work schedule on such symptoms or disorder.

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