

Psychosocial Factors and Habits Associated with Functional Dyspepsia in Interns at a National Hospital in Piura-Peru

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Abstract

Objectives: The objective of this study was to determine psychosocial factors and habits associated with functional dyspepsia (FD) in medical interns at the Sullana-Piura II-2 support hospital. **Methods:** This was a prospective longitudinal study of 24 medical interns who answered five surveys: one baseline survey before beginning their medical internships, and another survey at the end of each rotation. The test "A new questionnaire for the diagnosis of dyspepsia" was used for diagnosis of FD, and all the tests used were validated. For bivariate and multivariate analysis, population averaged generalized estimating equations (PA-GEE) were used, using the binomial family and log link function, to obtain raw relative risks (rRR) and adjusted relative risks (aRR) and their 95% confidence intervals. **Results:** The mean age was 24.1 years (+/- 1.4), 58% (14) were women. The prevalence of dyspepsia among interns was 32%. Having anxiety ($p < 0.001$, aRR: 5.9, 95% CI: 2.88-12.13) or depression ($p = 0.015$, aRR: 3.4, 95% CI: 1.27-9.29) were risk factors for FD, obtaining a better score at the end of a rotation was a protective factor ($p = 0.020$, aRR: 0.8, 95% CI: 0.71-0.97). RRs were adjusted for irritability and consumption of energy drinks. **Conclusions:** According to the data evaluated, those who have a psycho-social disorder during hospitalization are predisposed to suffer greater risks for gastro-intestinal diseases, so that institutions must have programs to detect and monitor these pathologies.

Keywords

Dyspepsia, medical students, depression, anxiety, (Source: DeCS BIREME).

INTRODUCTION

Functional dyspepsia (FD) is characterized by four cardinal symptoms in the last trimester: postprandial fullness, early satiety, epigastric pain and epigastric burning. It is one of the most common gastrointestinal disorders in the population. (1-3) Worldwide, dyspepsia may account for up to 40% of gastrointestinal pathologies. Nevertheless, only one-tenth of this group of patients seek medical help. Diagnosis is even more difficult because there is no specific organ that is affected. (4, 5, 6, 7). FD is usually detected epi-

gastric pain syndrome and postprandial distress syndrome are present. (8)

There are few reports of dyspepsia in young adults, despite the fact that this group is among the most affected because of their relationship with dietary disorders and the high prevalence of associated psychosocial pathologies. (9-13) Students are at great risk because of academic overload, anxiety depression, irritability and stress. (10, 14, 15, 16) Studying populations like students which have high levels of stress is important, (17) and students in biomedical sciences suffer from constant and growing demands,

academic overload, tests and inappropriate time management. (18) This increases in the last year of medicine as students are given the added responsibility of working long hours caring for others. (19)

Our objective was to determine psychosocial factors and habits associated with FD among medical interns at Sullana, Piura Support Hospital II-2.

MATERIALS AND METHODS

Study Design

A prospective longitudinal study was conducted from December 2011 to December 2012. Self-administered surveys were distributed to medical interns at the Sullana II-2 Support Hospital in Piura before beginning the medical internships and after completion of each of the four rotations. All interns who completed the internship at the hospital agreed to voluntarily participate in the study and were included. Two measurements of one intern were excluded: the baseline measurement and the one after the first rotation. This intern was at a social security hospital in Piura until the end of the first rotation of his internship. Similarly, the last measurement of another intern was excluded because it was not received in time.

Instruments and Variables

A questionnaire with both open and closed questions was prepared. The dependent variable was elaborated on the basis of answers given to the questionnaire for determining dyspepsia according to the scale validated for the Spanish version of "A new questionnaire for the diagnosis of dyspepsia". The questionnaire was considered positive if there were three or more points of the nine items on the survey.

Socioeconomic factors of age, gender, marital status, paternity and economic independence were also included. Academic data analyzed included year of entry, current academic semester, failure of any course, and hours of study outside college hours. Anthropometric measures and data from clinical histories used included BMI (according to World Health Organization (WHO) criteria), eating habits (compliance with schedule and eating place), anxiety (Spanish validated scale for diagnosis of Zung's anxiety, positive if score is over 56/80 points), depression (Spanish validated scale for diagnosis of Beck's depression, positive for mild depression for scores of four to eight of 20 points), irritability (Minnesota Multiphasic Personality Inventory-2, positive if score is more than five points out

of 16), habitual smoking (Spanish validated Fargerstrom scale, positive for scores of four of 10 points), habitual alcohol consumption (CAGE scale, positive for scores of two of four 4 points), and consumption of energy drinks.

Procedure

A survey was prepared on the basis of the validated tests. It was then submitted to the Committee on Ethics and Administrative Instances of Sullana II-2 Support Hospital and the National University of Piura (UNP). Preliminary results were presented as part of the undergraduate thesis of one of the authors (CQO).

The first survey was conducted in December 2011, days before the interns began their rotations at the Hospital. The second, third, fourth and fifth surveys were administered at the end surgery, gynecology, pediatrics and internal medicine rotations. Once the data were obtained, they were entered into a database Excel for Windows 2010. Finally, we cleaned the data prior to statistical analysis.

Statistical Analysis

Data were analyzed in Stata 11.1 statistical package. In the descriptive analysis, numerical variables were evaluated with Shapiro-Wilk test of normality and their means and standard deviations were noted. Categorical variables were described using frequencies and percentages. For the longitudinal analytical statistic, population averaging generalized estimating equations (PA-GEE) were used. Crude relative risks (CRR), adjusted relative risks (ARR) and 95% confidence intervals (95% CI) were calculated. For this, we used the binomial family, the log link function and robust models. The time variable was the rotation in which the questionnaire was taken. A value of $p < 0.05$ was considered to be statistically significant.

RESULTS

All of the 24 interns worked at Sullana Support Hospital II-2 during 2012 were surveyed. The average age of participants was 24.1 years (standard deviation [SD]: 1.39 years). 58.3% (14) were women, 100% were single, only 1 (4.2%) had a child, 50.0% (12) lived alone, and 54.2% (13) of interns came from the National University of Piura. Socio-academic characteristics of the respondents are shown in Table 1.

Table 2 shows characteristics grouped by the quarters in which the survey was taken. 28.2% of the interns had functional dyspepsia during the five surveys with the highest percentages in the first and third quarters (23.5%).

Table 1. Socio-academic characteristics of the interns of medicine of Hospital de Apoyo II-2 de Sullana, 2012

Variables	n	(%)
Gender		
Male	10	41.7
Female	14	58.3
Age*	24.1	±1.39
Place of birth		
Piura	11	45.8
Sullana	5	20.8
Trujillo	3	12.5
Other	5	20.9
University		
UNP	13	54.2
UPAO-Trujillo	9	37.5
UCV-Trujillo	2	8.3
Living situation		
Alone	12	50.0
With parents and/or siblings	6	25.0
With spouse or companion	4	16.7
With friends	2	8.3
Income/financial support		
Work	2	8.3
Parent's money	2	8.3
Work and family support	20	83.4
Daily hours of study		
Less than 1 hour	7	29.2
1-3 hours	9	37.5
3-5 hours	8	33.3

UCV: Universidad César Vallejo; UNP: Universidad Nacional de Piura; UPAO: Universidad Privada Antenor Orrego.

* Median and standard deviation

Baseline alcohol dependence was 8.4% (4), a percentage that gradually increased to the maximum percentage of 27.7% (13) found in the 3rd and 4th quarters. Reported sleep problems also increased, starting at 0% (0) in the baseline measurement and increasing gradually to 28.1% (16) in the last survey (Table 2).

We also studied the presentation of our main variable and of other factors according to the rotations. These results are shown in Table 3. In relation to dyspepsia, the highest number was observed in the surgery rotation (15; 50%), followed by internal medicine (6; 20%), pediatrics (5; 16.7%) and gynecology (4; 13.3%). With respect to psychosocial factors, the largest number of interns had anxiety, depression and irritability during the surgery rotation: seven (41.2%), five (38.5%) and twelve (38.5%) respectively.

Regarding legal drugs, alcohol consumption was higher when interns worked in surgery and gynecology (27.9%) and coffee consumption was highest during the pediatrics rotation (29.2%).

The largest number of problems with sleep were recorded during the rotation (28.1%) (Table 3).

The bivariate analysis found a strong association between dyspepsia and depression ($p < 0.001$), anxiety ($p < 0.001$), grade obtained for rotation ($p = 0.014$), irritability ($p = 0.007$) and consumption of energy drinks ($p = 0.019$) (Table 4).

The multivariate analysis showed that the risk of dyspepsia increased as the degree of depression ($p = 0.015$, RRA: 3.4, 95% CI: 1.27-9.29) or anxiety ($p < 0.001$; RRA : 5.9, 95% CI: 2.88-12.13) increased. In contrast, the risk of dyspepsia decreased when grades increased and as a result of a change in rotation ($p = 0.020$, RRA: 0.8, 95% CI: 0.71-0.97). These results were adjusted for irritability and consumption of energy drinks (Table 4).

DISCUSSION

Recognition of factors that influence the development and appearance of FD is important because of its high prevalence and the absence of any organic cause that can be treated. It is especially important for groups at risk for this pathology. The prevalence of functional dyspepsia among interns was highest in the first and third quarters. Higher frequencies were also observed in certain rotations, especially in surgery. This may be due to the fact that this rotation involves great responsibility and the attending physicians in this hospital are quite demanding. This results in interns spending more hours in the hospital than during other rotations. In addition, they must participate in a minimum number of surgical procedures. This observation is similar to the findings of a study carried out at a private university in the capital. There, high academic pressure, workload, financial instability, lack of sleep and closeness to patients' illnesses were found to have negative effects on the health of the students. In that group there was a greater prevalence of psychopathology, depression, anxiety, substance abuse and suicidal ideation. (20)

FD was associated with some degree of depression. Interns who were depressed were 1.4 times more likely to have dyspepsia than those who were not. This is consistent with a study by Silva et al. who found that patients with depression had three times greater risk of having functional dyspepsia than did those who did not suffer from depression. (21) This is also consistent with a study conducted in four medical schools in Latin America in which depression was found to be associated with FD. (22) Therefore, this pathology should be monitored and controlled in at risk groups, above all because of potential short and long term consequences.

Another strong association was found between anxiety and dyspepsia: interns who suffered from anxiety had a 3.9 times higher risk of dyspepsia than did other interns. This

Table 2. Frequency of characteristics associated with dyspepsia according to the quarter in which the survey was conducted

	Quarter in which survey was taken n (%)									
	Base		1 st		2 nd		3 rd		4 th	
Functional dyspepsia	3	(8.8)	8	(23.5)	9	(26.5)	8	(23.5)	5	(17.7)
Dyspepsia with stomach full	2	(11.0)	5	(27.8)	5	(27.8)	3	(16.7)	3	(16.7)
Dyspepsia with empty stomach	1	(7.1)	3	(21.4)	4	(28.6)	4	(28.6)	2	(14.3)
Mixed Dyspepsia	0	(0)	0	(0)	0	(0)	1	(100)	0	(0)
Anxiety	1	(5.6)	3	(16.7)	6	(33.3)	6	(33.3)	2	(11.1)
Depression	1	(7.1)	4	(28.6)	4	(28.6)	4	(28.6)	1	(7.1)
Irritability	2	(6.1)	7	(21.2)	11	(33.3)	8	(24.2)	5	(15.2)
Tobacco	6	(22.2)	5	(18.5)	5	(18.5)	6	(22.2)	5	(18.5)
Alcohol	4	(8.4)	7	(14.9)	10	(21.3)	13	(27.7)	13	(27.7)
Coffee	2	(7.6)	6	(23.1)	6	(23.1)	6	(23.1)	6	(23.1)
Energy drinks	3	(8.2)	11	(29.7)	4	(10.8)	8	(21.6)	11	(29.7)
Sleeping problems	0	(0)	12	(21.1)	14	(24.5)	15	(26.3)	16	(28.1)
Scheduled meal times	23	(31.9)	12	(16.7)	14	(19.4)	13	(18.1)	10	(13.9)
Location where meals eaten										
Rooming house	18	(19.6)	18	(19.6)	19	(20.6)	19	(20.6)	18	(19.6)
Family home	5	(20)	5	(20)	5	(20)	5	(20)	5	(20)

Table 3. Frequency of characteristics associated with dyspepsia according to interns' rotations

	Rotations n (%)							
	Surgery		Gynecology		Pediatrics		Medicine	
Dyspepsia	15	(50.0)	4	(13.3)	5	(16.7)	6	(20.0)
Dyspepsia with stomach full	8	(50.0)	3	(18.8)	3	(18.8)	2	(12.5)
Dyspepsia with empty stomach	6	(46.2)	1	(7.7)	2	(15.4)	4	(30.8)
Mixed dyspepsia	1	(100)	0	(0)	0	(0)	0	(0)
Anxiety	7	(41.2)	2	(11.8)	2	(11.8)	6	(35.3)
Depression	5	(38.5)	2	(15.4)	5	(38.5)	1	(7.7)
Irritability	12	(38.5)	2	(15.4)	5	(38.5)	1	(7.7)
Tobacco	5	(23.8)	6	(28.6)	5	(23.8)	5	(23.8)
Alcohol	12	(27.9)	12	(27.9)	11	(25.6)	8	(18.6)
Coffee	6	(25.0)	5	(20.8)	7	(29.2)	6	(25.0)
Energy drinks	9	(26.5)	10	(29.4)	9	(26.5)	6	(17.7)

Table 4. Longitudinal bivariate and multivariate analysis of functional dyspepsia and its association with variables among medical interns at Hospital de Apoyo II-2 de Sullana; 2012

	Bivariate		Multivariate*	
	CRR (95% CI)	p	ARR (95% CI)	p
Depression	2.7 (1.56-4.54)	<0.001	3.4 (1.27-9.29)	0.015
Anxiety	4.6 (2.66-7.88)	<0.001	5.9 (2.88-12.13)	<0.001
Grade obtained in rotation	0.8 (0.74-0.97)	0.014	0.8 (0.71-0.97)	0.020
Irritability	2.0 (1.22-3.49)	0.007	0.9 (0.55-1.40)	0.587
Consumption of energy drinks	2.3 (1.15-4.52)	0.019	1.5 (0.84-2.75)	0.171

95% CI: 95% confidence intervals; P: value p; ARR: adjusted relative risks; CRR: crude relative risks. Values were obtained using PA-GEE with binomial family, log link function and robust models. The time during a rotation at which the questionnaire was answered varied.

agrees with the findings of Molano et al. that 50.1% of adolescents with dyspepsia also had symptoms of anxiety and that 53.6% had symptoms of depression. Similarly, Mak and et al. observed a higher prevalence of dyspepsia among those who specified "high anxiety" (20.3%) than among those who were not dyspeptic (10.8%). (10)

We found that receiving a higher grade at the end of the rotation was a factor that protected interns from dyspepsia. This agrees with a study that concluded that 61.1% of young people with dyspepsia attributed the onset of their symptoms to concerns of academic origin (followed by family difficulties). (23) Another study that reinforces this finding was conducted at eight medical schools in Peru. Failing a course increased the frequency of dyspepsia (prevalence ratio: 1.24, confidence interval: 1.13-1.37). (24) This issue should be studied in greater depth in the future since low grades can provoke frustration and stress which can negatively affect students. In the near future, studies should address this issue, as well as possible interventions to improve this situation.

Another relevant fact is that interns' alcohol consumption progressively increased as they went through the quarters to reach a level that was more than twice the baseline. This is in line with the various reports that cigarette smoking and alcohol consumption are significant among adolescents with dyspepsia. (15) A review in Chile showed that 80% of interns consumed alcohol and that 6.4% of medical students showed alcohol dependence. These data are alarming because excessive consumption increases risks for many health problems. If this is not controlled, it can seriously affect this population when they enter the professional world. (3)

One limitation of this study was the small sample size. For this reason, the results cannot be extrapolated to all medical interns in Peru. Nevertheless, the data are still important especially because there are no previous reports of follow-up of this type of population in our country. In addition, since this study included medical students from public and private universities, the sample is similar to other population groups. Another limitation was that because it was a census study, confidence intervals were not the best statistical measure even though they are useful for comparison of the results with other studies. We recommend that this study be conducted in larger populations with appropriate sampling techniques to find relationships that can be extrapolated.

Based on the population studied, we conclude that interns with some degree of depression, anxiety and alcohol dependence are at higher risk for functional dyspepsia, but that gaining higher grades is a protective factor against FD.

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