

Assessment of Health-Related Knowledge and Practices among Patients with Peptic Ulcer

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Abstract

Background: Peptic ulcer disease (PUD) is defined as an ulcerative disorder in the lower esophagus, lower portion of the stomach, and upper duodenum. It is a serious global health problem. Appropriate care for peptic ulcer patients becomes dynamic when physicians affect their responsibility meaningfully and competently through assessment, planning, implementation and evaluation.

Aim: This study aimed to assess health-related knowledge and practices of patients with peptic ulcer at Abha, Saudi Arabia.

Methodology: It is a descriptive cross sectional approach that targeted all accessible patients with peptic ulcer attending or admitted to the study settings during the period from January 2019 to March 2019. A direct interview questionnaire constructed by researchers was used for data collection. It was composed of three parts (patients' socio-demographic and clinical data- PU patient's knowledge interview tool, and data regarding patients' health-related practices).

Results: A total 155 patients with peptic ulcer, aged from 20 to 60 years were included. 52.3% of the patients were males and 44.5% were not working. Stomach pain was the most frequent symptom (88.4%) followed by hyperacidity (60.6%). Regarding the awareness of patients about their disease, 87.7% of them knew about symptoms of peptic ulcer followed with drugs and treatment methods (81.3%). In total 18.1% of the patients had good knowledge regarding peptic ulcer.

Conclusions & recommendations: The study revealed that patients' awareness level about their disease was poor especially regarding the nature of the disease, at risk population and its complications. As for health-related practice, the majority of patients had unhealthy behavior such as having drinks which may aggravate hyperacidity status. Also adherence to prescribed medication is not high and some have un-prescribed medications.

Key words: Peptic ulcer, Gastric ulcer, duodenal ulcer, Awareness, knowledge, Practice, Hyperacidity, gastric erosion

Background

Health-related behavior in early life influences later risks for lifestyle-related disorders. It is therefore important to investigate health behaviors among young people. University students represent a major segment of the young adult population. Peptic ulcer disease (PUD) is defined as ulcerative disorders in the lower esophagus, lower portion of the stomach, and upper duodenum (1). Helicobacter Pylori infection, non-steroidal anti-inflammatory drugs (NSAIDs) and associated health-related practices are the main factors behind peptic ulcer. These causes have led to important changes in diagnostic and treatment strategies, with the potential for improving the clinical outcomes, decreasing health care costs and have made health-related practices become the fundamental area of interest of practitioners and scientists of many disciplines (2-4).

As a serious and global healthcare issue, PUD accounted for roughly 10% of medical costs for digestive diseases in the last two decades, and it is still a major cause of morbidity and mortality (3). Previous studies have shown differences in the prevalence of peptic ulcer disease among various communities to be associated with variation in diet and eating patterns (2, 4).

A variety of organic etiologies and risk factors are associated with PUD, like H. pylori infection, NSAID use, being unmarried, smoking, type O blood group, and eating irregular meals (5,6). According to the American Psychological Association, psychosocial factors and stress play a significant role in the incidence and recurrence of peptic ulcers (7-9). It is also possible to develop peptic ulcer disease with or without the risk factors (10-12). Other less common causes are hypersecretory states, such as Zollinger-Elison syndrome, cell hyperplasia, macrocytosis, and basophilic leukemia (13).

The most common symptom of peptic ulcer is a burning or gnawing epigastric pain. Weight loss, bloating and nausea are comparatively inferior indicators (6, 14). Therapeutic management of PUD has changed dramatically, and aims to eliminate conditions that aggravate it and to prevent recurrence or complications. The treatment has evolved from dietary modifications only and surgery to acid suppression with antacids, H₂ receptors antagonist (H₂RAs), proton pump inhibitors and eradication of H. Pylori infection (15). Recurrence of PUD is increased due to poor health-related practices followed by peptic ulcer patients. Furthermore, modifying health-related practices are always needed to help in minimizing the chances of peptic ulcer disease from recurring (16). Therefore, proper care for peptic ulcer patients becomes important when physicians affect their responsibility meaningfully and competently through assessment, planning, implementation and evaluation. So, there is great importance to investigate health related knowledge and practices among those patients about the disease and the different therapeutic maneuvers (17). The current study therefore aimed to assess health-related knowledge and practices of patients with peptic ulcer, at Abha, Saudi Arabia.

Methodology

A descriptive cross-sectional approach was applied for this current research study. The research targeted all accessible patients with peptic ulcer attending or admitted to the study settings during the period from January 2019 to March 2019. A total sample of 155 peptic ulcer patients was required to estimate awareness level regarding peptic ulcer of 63% (18) using a precision of 7% at a 95% confidence level. The sample size was calculated using STATA 11 software using previously listed parameters. Patients fulfilling the inclusion criteria were consecutively included in the study after explaining the objectives and importance of the research until the total required sample size was obtained. The patients eligible for being included were those who had a peptic ulcer for at least 3 months and were able to communicate. After obtaining permission from the Institutional ethics committee, a direct interview questionnaire was used for data collection. A questionnaire was constructed by researchers based on intensive literature review and expert consultations. The questionnaire was composed of three parts. The first part included patients' socio-demographic and clinical data like Patient diagnosis, present medical history, associated diseases, family history, signs and symptoms and peptic ulcer complications. The second part consisted of peptic ulcer patient's knowledge interview tool. This part covered the definition of peptic ulcer, signs and symptoms of the disease, risk factors for having the disease, medication, management and complication of peptic ulcer disease etc. The third part focused on patients' health-related practices such as eating habits, activities of daily living, smoking, medication (prescribed and over the counter) and compliance with their therapeutic regimen.

Data analysis

Questionnaires were collected then coded and revised, and data was entered into Statistical Software IBM SPSS version 22. The given graphs were constructed using Microsoft Excel software. All statistical analysis was done using two-tailed tests and an alpha error of 0.05. A P-value less than 0.05 was considered to be statistically significant. Frequencies and percentages were used to describe the distribution of patients' demographic and clinical data. Knowledge and practice questions were isolated and scored. One (+1) mark was given for every correct response and zero (0) for an incorrect response. The total knowledge score was the sum of all correct answers and was divided into two categories: poor and good knowledge level according to the median. Chi-square / Monte Carlo exact test and Fishers exact test were used to test for the association between patients' knowledge level and different demographic, clinical and practice variables.

Results

The study included 155 patients with peptic ulcers with their ages ranging from 20 to 60 years and mean age of 38.6 ± 11.8 years old. Males were 52.3% of the sampled patients and 44.5% were not working. About 68% of the patients were from rural areas and 61.3% were married. A total of 38.1% were illiterate while 18.7% were university educated. About 52% of the patients had a chronic health problem mainly GIT disorder. Previous infection with *H. pylori* bacteria was recorded among 71% of the patients and 30.3% had a family history of peptic ulcer from the first degree and 16.1% of other relatives (Table 1).

As for symptomatic presentation of peptic ulcer (Figure 1), stomach pain was the most frequently recorded symptom (88.4%) followed by hyperacidity (60.6%), underweight (57.4%), vomiting (40.6%), loss of appetite (39.4%) while vomiting of blood was found to be least frequent (7.7%).

Table 2 illustrates data regarding peptic ulcer. A total 58.7% of the patients had gastric ulcer followed by duodenal ulcer (36.8%) and 4.5% did not know about their disease. As for peptic ulcer duration, 50.3% were diagnosed for more than one year and 14.8% were diagnosed 6 months ago. About 25.5% of the patients consulted physicians with symptoms while 57.4% only did when symptoms were increased. Regarding complications, 45.2% of the patients had no complications while 31% complained of loss of appetite and 9% complained of vomiting of blood and black stool. Considering regular doctor visits for follow up, 14.2% of the patients did and 61.3% comply with doctor's advice and treatment.

Regarding the awareness of patients about their disease (Figure 2), 87.7% of the patients knew about symptoms of peptic ulcer followed by drugs and treatment methods (81.3%), complications (63.2%) while 46.5% of the patients defined peptic ulcer correctly. In total 18.1% of the patients had good knowledge regarding peptic ulcer.

As for patients health-related practices (Table 3), 54.2% of the patients had two meals daily and 44.5% had three meals. About 32% of the patients did not have snacks in between meals. A total of 53% of the patients had a special diet due to their ulcer and 31.6% avoided hunger. 80.6% of the patients had drinks containing caffeine, more than twice daily among 34.4% of them. About 37% of the patients had soft drinks, once daily among 32% of the peptic ulcer patients. As for smoking, 28.4% of the patients were current smokers and 13.5% were ex-smokers. About 27% of the smokers had cigarettes for 4 to 6 years while 21.5% smoked for more than 6 years. As for sleeping hygiene, 58.7% of the patient's slept for 6 to 8 hours and 36.8% slept for less than 6 hours daily. Also 30.3% experienced problems with sleeping. As for medications, 75.5% of the patients knew about medication and 16.1% took their medications without prescription.

Finally, on relating awareness level with patients' demographic data, clinical data and behavior (Table 4) it was clear that 21.6% of patients aged 20-30 years had good knowledge regarding peptic ulcer compared to 2.9% of old aged patients (50-60) with statistically significant difference ($P=.001$). Also 47.1% of working patients had good knowledge compared to 14.5% of those who did not work ($P=.001$). Considering the residence area, 34.7% of the patients were from urban areas with good knowledge compared to 10.4% of rural residence ($P=.001$). The level of education was also found to be statistically significant; 58.6% of university graduate patients had good knowledge compared to none of the illiterate patients ($P=.001$). Also 23.6% of patients with a history of *H. pylori* infection had good knowledge compared to those with a negative history. Patients with a family history of peptic ulcer had significantly higher knowledge level than others without (29.8% and 14.5%, respectively). Also medication awareness was significantly related to disease awareness among 39.4% of the total patients ($P=.001$).

Table 1: Bio-Demographic characteristics of patents with peptic ulcer attending ACH, Saudi Arabia

Bio-Demographic data	No	%	
Age in years	20-	51	32.9%
	30-	41	26.5%
	40-	29	18.7%
	50-60	34	21.9%
Gender	Male	81	52.3%
	Female	74	47.7%
Occupation	Office work	34	21.9%
	Manual work	52	33.5%
	Not-working	69	44.5%
Area of residence	Rural	106	68.4%
	Urban	49	31.6%
Marital Status	Single	47	30.3%
	Married	95	61.3%
	Divorced / widow	13	8.4%
Educational degree	Illiterate	59	38.1%
	Basic	33	21.3%
	Secondary	34	21.9%
	University	29	18.7%
Chronic health problem	No	74	47.7%
	Yes	81	52.3%
If yes, mention	GIT	41	50.6%
	Cardiac	7	8.6%
	Others	33	40.7%
Have you ever been infected with H pylori bacteria?	No / don't know	45	29.0%
	Yes	110	71.0%
Does one of your family have a history of peptic ulcer?	No / don't know	83	53.5%
	First degree relative	47	30.3%
	Others	25	16.1%

Table 2: Peptic ulcer data for patients attending ACH, Saudi Arabia

Peptic ulcer data		No	%
Type of ulcer	Gastric ulcer	91	58.7%
	Duodenal ulcer	57	36.8%
	Don't know	7	4.5%
Duration of PUD	Less than 6 months	23	14.8%
	6-12 months	54	34.8%
	More than one year	78	50.3%
When did you expose yourself to the doctor?	With onset of symptoms	44	28.4%
	When symptoms increased	89	57.4%
	With complications	22	14.2%
Have you ever suffered from one of these complications?	No	70	45.2%
	Bloody vomiting	15	9.7%
	Black stools	14	9.0%
	Loss of appetite	48	31.0%
	All	8	5.2%
Do you go to the doctor on a regular basis?	No	115	74.2%
	Sometimes	18	11.6%
	Yes	22	14.2%
Do you comply with the regimen prescribed by your doctor?	No	60	38.7%
	Yes	95	61.3%

Table 3: Health related practice among patients with peptic ulcer attending ACH, Saudi Arabia

Health related practice	No	%
How many meals covered in a day?	One meal	1.3%
	Two meals	54.2%
	Three meals	44.5%
Do you eat any food between meals?	Permanently	14.8%
	Sometimes	53.5%
	I do not ever	31.6%
Are you on a special diet because of peptic ulcer?	No	47.1%
	Yes	52.9%
Do you avoid hunger because of an ulcer?	No	68.4%
	Yes	31.6%
Are you taking drinks containing caffeine (stimulants such as tea, coffee, Nescafe)	No	19.4%
	Yes	80.6%
If yes or sometimes how many times per day?	Once	32.0%
	Twice	29.6%
	More than two times	38.4%
Are you taking any soft drinks?	Sometimes	36.8%
	Yes	37.4%
If your answer is yes how many times a day?	Once	62.6%
	Once per week	36.5%
Are you a smoker?	No	58.1%
	Ex-smoker	13.5%
	Yes	28.4%
How long have you smoked?	Less than two years	13.8%
	2 -> 4 years	21.5%
	4 -> 6 years	27.7%
	6 -> 10 years	21.5%
	10+	15.4%

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How many hours of sleep do you have per day?	4 -> 6 hours	57	36.8%
	6 -> 8 hours	91	58.7%
	8 -> 12 hour	7	4.5%
Are there any problems with sleep	No	64	41.3%
	Sometimes	44	28.4%
	Yes	47	30.3%
Do you know the medication that you take?	No	38	24.5%
	Yes by format	46	29.7%
	Yes by name	71	45.8%
Are you regular in taking medication on time?	No	28	18.1%
	Sometimes	39	25.2%
Do you take medication without a doctor's prescription?	No	66	42.6%
	Sometimes	64	41.3%
	Yes	25	16.1%

Figure 1: Symptoms of Peptic ulcer among patients attending ACH, Saudi Arabia

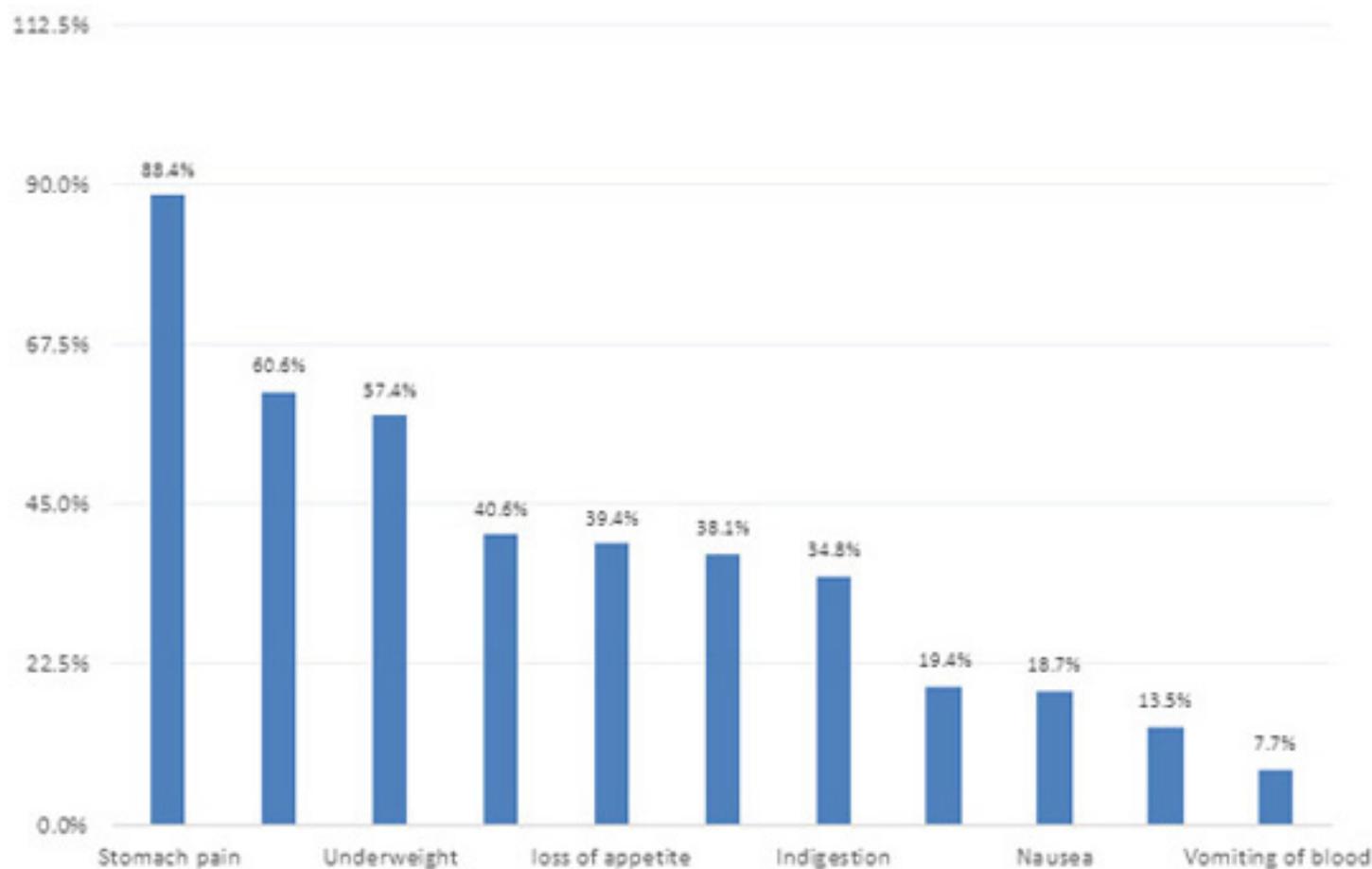


Table 4: Predictors of awareness level among patients with peptic ulcer, ACH, Saudi Arabia

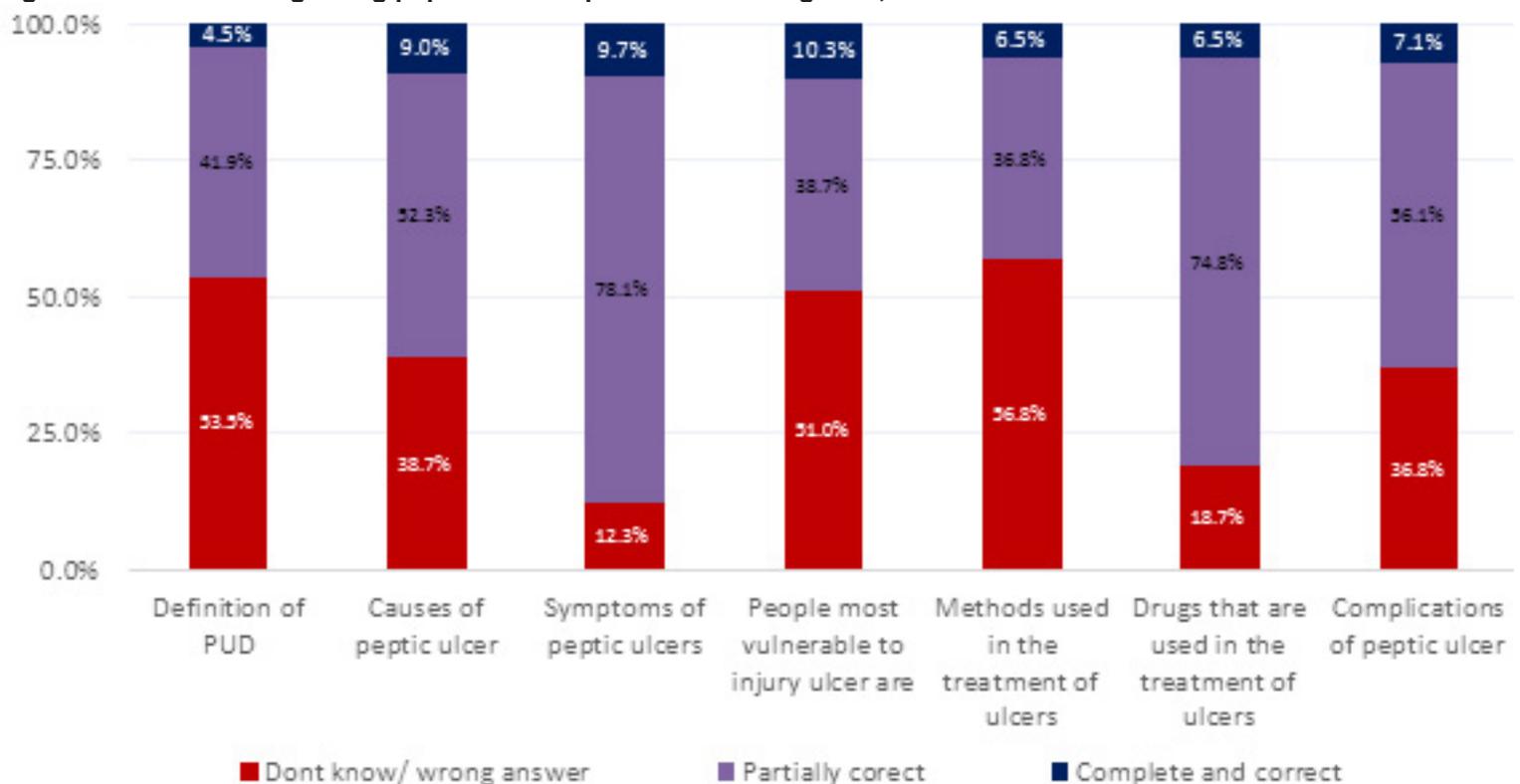
Factors		Knowledge level				P-value
		Poor		Good		
		No	%	No	%	
Age	20-	40	78.4%	11	21.6%	.001*
	30-	26	63.4%	15	36.6%	
	40-	28	96.6%	1	3.4%	
	50-60	33	97.1%	1	2.9%	
Gender	Male	64	79.0%	17	21.0%	.322
	Female	63	85.1%	11	14.9%	
Occupation	Office work	18	52.9%	16	47.1%	.001*
	Manual work	50	96.2%	2	3.8%	
	Not-working	59	85.5%	10	14.5%	
Area of residence	Rural	95	89.6%	11	10.4%	.001*
	Urban	32	65.3%	17	34.7%	
Educational degree	Illiterate	59	100.0%	0	0.0%	.001*
	Basic	33	100.0%	0	0.0%	
	Secondary	23	67.6%	11	32.4%	
	University	12	41.4%	17	58.6%	
Have you ever been infected with H pylori bacteria?	No / don't know	43	95.6%	2	4.4%	.005*
	Yes	84	76.4%	26	23.6%	
Does one of your family have a history of peptic ulcer?	No / don't know	71	85.5%	12	14.5%	.033*
	First degree relative	33	70.2%	14	29.8%	
	Others	23	92.0%	2	8.0%	
Are you on a special diet because of peptic ulcer?	No	57	78.1%	16	21.9%	.239
	Yes	70	85.4%	12	14.6%	
Are you taking any soft drinks?	No	40	100.0%	0	0.0%	.001*
	Sometimes	53	93.0%	4	7.0%	
	Yes	34	58.6%	24	41.4%	

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	No	75	83.3%	15	16.7%	
Are you a smoker?	Ex-smoker	16	76.2%	5	23.8%	.745
	Yes	36	81.8%	8	18.2%	
	No	38	100.0%	0	0.0%	
Do you know the medication that you take?	Yes by format	46	100.0%	0	0.0%	.001*
	Yes by name	43	60.6%	28	39.4%	

* P < 0.05 (significant)

Figure 2: Awareness regarding peptic ulcer of patients attending ACH, Saudi Arabia



Discussion

Helicobacter pylori is a gram-negative bacteria that usually attacks the gastric mucosa. *H. pylori* are associated with chronic gastritis, peptic ulcer disease, and gastric cancer (1). Gastric and duodenal ulcers are two types of peptic ulcers. An ulcer is defined as a break in the stomach mucosa in the upper part of the small intestine, or sometimes in the lower esophagus. Around 4% of the global population complains of peptic ulcer (19). The lifetime risk of developing a peptic ulcer among the general population is about 10% (20). Peptic ulcers contributed to 301,000 deaths in 2013, which is less than 327,000 deaths in 1990 (21). With a gastric ulcer, stomach pain may become worse after eating. It may appear other symptoms like poor appetite, belching, weight loss and vomiting. There are no symptoms in around one-third of the geriatric population (19-22).

Patients' awareness about their illness plays an important role in the management and prevention of recurrence of peptic ulcer disease. The current study aimed at assessing peptic ulcer patients' awareness and health-related behavior regarding their illness which helps in controlling diseases advances and complications.

The current study revealed that most of the sampled peptic ulcer patients were at a young age (below 40 years) and predominantly males. Also non-working status was the most recorded profile which may be associated with stress and worry due to lack of regular income resulting in stress ulcers. As for symptoms, gastric pain was the most frequently recorded symptom followed by hyperacidity and underweight with loss of appetite that resulted in reduced weight as the patient became afraid of eating. Vomiting of blood and black stool was recorded but in comparatively less number of cases.

Considering peptic ulcer data the gastric ulcer was the most frequently reported, which lasted for more than one year among half of the cases. The majority of patients seek medical advice after aggravation of symptoms due to gastric pain which is a problem as symptoms may be more severe with or just before having complications. This area of defect in patients' awareness may result in more prevalent complications and delay in the therapeutic management reducing the chance for early recovery. More than half of the cases had at least one type of peptic ulcer complications especially loss of appetite due to fear of eating. This high rate of complications is associated with delayed medical consultation. Also about one-third of the patients who had medical treatment did not comply with the treatment plan.

As for patients' awareness regarding their disorder, the majority of patients know about signs and symptoms. This high level of awareness may be because they are now experienced and may have been unaware of it before. Also, good awareness level was recorded for drugs used in treatment, complications, and causes. Poor awareness

was recorded for the definition of peptic ulcer, and at risk people, and strategy of treatment. Overall knowledge was poor as nearly one of each five patients had good knowledge regarding their disorder. Young age, high education, urban residence and family history of peptic ulcer were the most important detectors of the patient's awareness level.

These findings were in concordance with that recorded by Lee MG et al. in 1995 (23) in Jamaica. The study revealed that sixty-three percent of patients knew their ulcer location but 37% were unaware of their diagnosis. Twenty-nine percent received most of their information from their pharmacists. Another study was conducted by Charles C et al. 2000 (24) who found that most respondents recorded that peptic ulcer is a common disorder. Also gastritis as a common cause of dyspepsia. X-ray/ Gastroscopy can be considered as the preferred confirmatory diagnostic approach.

Considering health-related practices of peptic ulcer patients, the current study revealed that the majority of cases have three meals daily and have special food due to peptic ulcer. Having drinks or foods which may induce peptic ulceration was recorded among a significant portion of the patients. Also smoking as a risk factor was recorded among nearly half of the cases. Sleep disorders due to peptic ulceration were recorded among more than half of the sampled cases. These findings were also confirmed by Lee MG et al 1995 (23).

Saudi patients' awareness of their ulcer disease is inadequate. More attention should be paid to improving patients' awareness and their health-related behavior. Physician education of their patients as well as public health promotion about peptic ulcer disease may be the most adequate and applicable methods to be implemented in future.

Conclusions and Recommendations

In conclusion, the study revealed that patients' awareness level regarding their disease was poor, especially the nature of the disease, risky population and its complications. The poor knowledge was mainly recorded among old aged patients with low education levels and resident in rural areas. As for health-related practice, the majority of patients had unhealthy behavior such as having drinks which may aggravate hyperacidity status. Also adherence to prescribed medication is not high and some have un-prescribed medications. Researchers recommend that more attention should be paid to peptic ulcer patients' awareness regarding disease nature, risk factors and complications with health education sessions to improve their health-related practice. This is the role of medical staff and health care providers which may have a crucial role in reducing this chronic healthcare issue.

References

1. Najm WI (September 2011). "Peptic ulcer disease". *Primary Care*. 38 (3): 383–94, vii.
2. Vakil N. *Gastrointestinal and Liver Disease: Pathophysiology, Diagnosis, Management*. 9th ed. Philadelphia, Saunders Elsevier; 2010. Available at: <http://www.mdconsult.com/books/about.do>, retrieved on, 10/11/2011
3. Joseph E. Peptic Ulcer - How Do You Know If You Have It? 2009, available at: <http://ezinearticles.com>, retrieved on, 1/12/2011.
4. GBD 2015. Disease and Injury Incidence and Prevalence Collaborators (October 2016). "Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015". *Lancet*. 388 (10053): 1545–1602.
5. Rama M, Siva N. Anti-gastric ulcer activity of *Plectranthusamboinicus* (Lour). *J. Chem. Pharm*, 2010, 2(3):374-80, available at: www.jocpr.com, retrieved on, 1/12/2011.
6. Right Diagnosis.com, Statistics by Country for Peptic Ulcer, Health Grades Inc, available at: <http://www.rightdiagnosis.com>, retrieved on, 1/12/2011.
7. American Society of Health Pharmacists, Therapeutic position statement on the identification and treatment of *Helicobacter pylori*-associated peptic ulcer disease in adults. *Am J Health Syst Pharm*2001; 58:331-7.
8. Johns H. Peptic Ulcer Disease, available at: <http://www.hopkins-gi.org> , retrieved on, 20/11/ 2011.
9. Wolfram Alpha knowledgebase. DALY: Disability - peptic ulcer disease, Adjusted Life Years, 2011, available at <http://www.wolframalpha.com> retrieved on, 15/10/2011.
10. Lee R, Loke A. Health-promoting behaviors and psychosocial well-being of university students in Hong Kong. *Public Health Nurs* 2005;66(5):271–2
11. Lewis S, Heitkemper M, Shannon D. *Assessment and management of clinical proplems*,7th ed, Philadelphia, Mosby,2007, 1014-20.
12. Anand BS, Simmy B, Waqar A. peptic ulcer disease 2011, available at: <http://emedicine.medscape.com>. Retrieved on, 11/2011.
13. Woodley J. Symptoms and Details of Peptic Ulcer Disease, 2006, available at: <http://ezinearticles.com/>. Retrieved on, 11/2011.
14. HuetherS,McCanceK. *UnderstandingPathophysiology*. Mosby, NewYork, 2000, 952-6.
15. Sarafino E. *Health psychology: biopsychological interaction*.4th ed. New York: John Wiley & Sons, 2002. 355-6.
16. American College of Gastroenterology website. Risk factors for peptic ulcer. 2006, available at: <http://www.acg.gi.org/> , retrieved on, 1/12/2011.
17. Smeltzer S, Brenda G. *Textbook of Medical Surgical nursing*, 9th ed, Philadelphia, Lippincott 2006, 860-2.
18. Lee MG, Soyibo K, Garro IO, Phillips N, Dale B. Peptic ulcer disease and Jamaican patients' awareness of their disorder. *The West Indian medical journal*. 1995 Jun; 44(2):58-9.
19. Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A. Global cancer statistics, 2012. *CA Cancer J Clin* (2015) 65(2):87–108.10.3322/caac.21262.
20. Najm WI. Peptic ulcer disease. *Primary care*. 2011; 38(3):383–94.
21. Snowden FM. Emerging and reemerging diseases: a historical perspective. *Immunol Rev*. 2008; 225(1):9–26.
22. GBD 2013. Mortality and Causes of Death, Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015; 385(9963):117–71.
23. Lee MG, Soyibo K, Garro IO, Phillips N, Dale B. Peptic ulcer disease and Jamaican patients' awareness of their disorder. *The West Indian medical journal*. 1995 Jun; 44(2):58-9.
24. Charles C, Sue M, Lord C, Morris E, Edwards S, Hope M, Peura D. Knowledge/awareness of gastritis/peptic ulcer diseases in Guyana. *Gastroenterology*. 2000 Apr 1; 118(4):A1221.