

**How to Cite:**

Priya, E. P., & Geetha, P. (2022). A knowledge, attitude and practice study about gastro-oesophageal reflux disease towards pharmacy students in private institution at Chennai: A web based cross sectional study. *International Journal of Health Sciences*, 6(S2), 11918–11930. <https://doi.org/10.53730/ijhs.v6nS2.8215>

## **A knowledge, attitude and practice study about gastro-oesophageal reflux disease towards pharmacy students in private institution at Chennai: A web based cross sectional study**

**E. Padhma Priya**

Pharm.D Intern, School of Pharmaceutical Sciences, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu, India

**P. Geetha**

Assistant Professor, Department of Pharmacy Practice, School of Pharmaceutical Sciences, Vels Institute of Science, Technology and Advanced Studies(VISTAS), Pallavaram, Chennai, Tamil Nadu, India

Corresponding author email: [lgeethapharma.sps@velsuniv.ac.in](mailto:lgeethapharma.sps@velsuniv.ac.in)

**Abstract**---Aim - The aim of the study is to show the knowledge, attitude and practice regarding Gastro-esophageal reflux disease among pharmacy students in private institution at Chennai. Material and Methods- The study is carried out with a sample size of 109 students in VISTAS, Pallavaram, at Chennai. It is a web based cross – sectional study. The data were collected by e-questionnaire of 25 questions into 4 domains, where demographic details and questions regarding knowledge, attitude and practice of Gastro-esophageal reflux disease were asked among pharmacy students in private institution. Result and Discussion- In our study questionnaire was circulated to 109 pharmacy students totally, but only 106 pharmacy students have responded giving response rate of (97.2%) who is studying in private institution at Chennai. Majority of pharmacy students responded from the age group above 22 years 32(34%), Most of response were from Male participants 60(56.6%) and Pharm D students 84(79.2%).The study result shows that pharmacy students have 77.6% knowledge about GERD, 85.7% attitude towards GERD and 75.9% practice towards GERD. Conclusion- The present study concluded that pharmacy student have adequate knowledge, attitude and practice about GERD and its management and have enough awareness regarding GERD management among pharmacy students.

**Keywords**---GERD, pharmacy students, knowledge, questionnaire.

## Introduction

Gastro-esophageal reflux disease defined as a symptoms or mucous damage which is produced by abnormal reflux of gastric acid content into oesophagus. <sup>[1]</sup> GERD is chronic or relapsing condition which will occur when the amount of gastric juice that refluxes into esophagus exceeds the normal limits. <sup>[2]</sup> Gastro-esophageal reflux disease is very common digestive disorder worldwide. Mostly half of the adult will report with this kind of problem. <sup>[3]</sup> GERD is classified into based on the presence/absence of NERD- Non erosive reflux disease and ERD – erosive reflux disease. <sup>[4]</sup> GERD is the most commonly encountered condition by both primary physician & gastroenterologists. <sup>[5]</sup> GERD occur in all ages but most common in older than 40 years of age. In which about 10-20% of people in western countries suffer from GERD symptoms on weekly basis & about 7% have symptoms daily. <sup>[7]</sup> No difference of incidences seen between men & women. <sup>[8]</sup>

There are 4 stages of GERD such as Mild GERD, Moderate GERD, Severe GERD and Last stage is esophagus cancer. Some of the risk factors & causes are due to aging of a person, excessive Body Mass Index (BMI) Smoking, anxiety/ depression & less physical activity at work. <sup>[9]</sup> Some of food habit may also lead to GERD. It also depends upon the timing of meals, food taken, and amount taken. Mainly at nighttime, wearing tight fitting, clothing, too much gas, Excessive weight (obesity, low chloride diet & some of medication may also lead to GERD. <sup>[10]</sup>

GERD occurs due to decreased sphincter pressure and lead to disruption of anatomical barriers associated with hiatal hernia, where it leads to esophageal clearance and mucosal resistance and lead to delayed gastric emptying time. <sup>[11]</sup> GERD has an alarm symptoms & typical symptoms such as heartburn, belching, Regurgitation, Hoarseness, Dysphasia, odynophagia and feeling fullness. <sup>[12]</sup> GERD can be classified according to their severity of symptoms as mild, moderate & severe GERD. Common complications which may lead if it is untreated such as esophagitis, esophageal stricture, Barrett's esophagus, esophageal ulcer and asthma attack. GERD can be diagnosed by symptom examination, endoscopic, barium swallow, acid perfusion & esophageal manometry. <sup>[13]</sup>

Antacids act as common treatment for mild effect of GERD. <sup>[14]</sup> The first line treatment for patient with GERD is H<sub>2</sub> receptor blockers such as Ranitidine, cimetidine. Proton pump inhibitor is most powerful medication for treating GERD such as pantoprazole, llaprazole, omeprazole. Even prokinetic agents such as metoclopramide are effective for patient with mild GERD. <sup>[15]</sup> Laparoscopic anti-reflux surgery for GERD may involve a procedure to reinforce the lower esophageal sphincter, called Nissen fundoplication. <sup>[16]</sup> In this procedure, the surgeon wraps the top of stomach around the lower esophagus after reducing the hiatal hernia, if present, and this recreate the “one way valve” that meant to prevent acid reflux. <sup>[17]</sup> This can be done using a single long incision on the upper abdomen or more commonly by minimally invasive technique using several small incisions called laparoscopic surgery. <sup>[18]</sup>

Some of the lifestyle which helps to reduce the GERD symptoms:

- Avoid lying down for at least 2 hours after a meal or after drinking acidic beverage, like soda other caffeinated beverages. This can help to prevent stomach contents from flowing back into esophagus.<sup>[19]</sup>
- Using an extra pillow can also help to prevent reflux and keep your head elevated while you sleep.
- Instead of having large meals, eat smaller meals and can have more frequent meals each day. This will help to digest and prevent heartburn.<sup>[20]</sup>
- Wear loose- fitting clothes to ease pressure on the stomach, which can worsen heartburn and reflux.<sup>[21]</sup>
- Quiet smoking, where smoking can increase the production of stomach acid and reduce the function of the lower esophageal sphincter, the muscle that keeps acid and other stomach content from reentering the esophagus. Smoking also decreases the amount of saliva, which neutralizes acid produced by the body.<sup>[22]</sup>
- Weight reducing can also help to reduce the symptoms of GERD, where suck kind of pressure can force some stomach contents back up the esophagus.<sup>[23]</sup>

The pharmacy students have extensive knowledge, practice regarding the drug therapy and lifestyle modification about GERD.<sup>[24]</sup> Pharmacist has great opportunities to guide /assist the patient through selection of best treatment option and most efficacious drugs for their symptoms. The medication review process is undertaken by pharmacists to provide an optimal point for assisting patient with GERD management & refer the patient to other health professional when necessary. Medication review should be made by pharmacist because it is important to note medication that may precipitate GERD symptoms. This study shows the familiarity, knowledge & practice about GERD among the pharmacy students. Therefore, the study was done to analyze the knowledge, attitude and practice regarding Gastro-esophageal reflux disease among pharmacy students in private institution.

### **Materials and Methods**

The study is carried out with a sample size of 109 students in VISTAS, Pallavaram, and Chennai. The sample size is calculated according to the formula. The study was carried out via online. The study is a web based cross –sectional study using E- Questionnaires. Before conducting the study, ethical approval was obtained from the Institutional Ethical committee (IEC).

### **Data collection and procedures**

A physician validated Questionnaire containing 26 questions is made into a Google form for which the link will be shared to students to evaluate knowledge, attitude and practice regarding Gastro esophageal reflux disease in private institution, to the students who are registered in Vels institute of science technology and advanced studies (VISTAS), Chennai will be sent the link to self-administered online questionnaires. The E-Questionnaires which is distributed among college students in department of pharmacy in a (VISTAS) through Google

forms, the link was created and used to circulate among the students by social media such as whatsapp, G-mail. The survey consists of demographic characteristics such as age, gender, education qualification and 3 sections contain question regarding knowledge, attitude, and practice regarding Gastro esophageal reflux disease. The filled online questionnaires will be submitted to investigators mail. The inclusion criteria for selecting the participants in this study is only Pharmacy students above 18 years from VISTAS are included in the study, where only Pharm D IV, V, and VI year students and M.Pharm I and II year students are included and students from other departments and other universities are excluded. B.Pharmacy students and Pharm D I,II,III Year students from VISTAS are excluded from the study. The statistical analysis was calculated based on review performed on E- Questionnaire, where the values were expressed as percentage or as mean and which is obtained by using MS- excel sheet.

## Results

All the questions from the questionnaire provided the information needed to frame the results to access the knowledge, attitude and practice regarding GERD among pharmacy students. The data were collected by e-questionnaire of 20 questions into 4 domains; where demographic details and questions regarding knowledge, attitude and practice of GERD were asked. In our study questionnaire was circulated to 109 pharmacy students, totally but only 106 pharmacy students have responded giving a response rate of (97.2%) who is studying in private institution at Chennai.

Majority of pharmacy students responded from the age group were 22 years 34(32%) followed by 23 years were 28(26.4%); 24 years were 20(18.9%); 21 years were 17(16%); 25 years were 6(5.7%). Only 1 (0.9%) were from 43 year old age group. Figure 1 which shows the age of the respondents by the way of percentage.

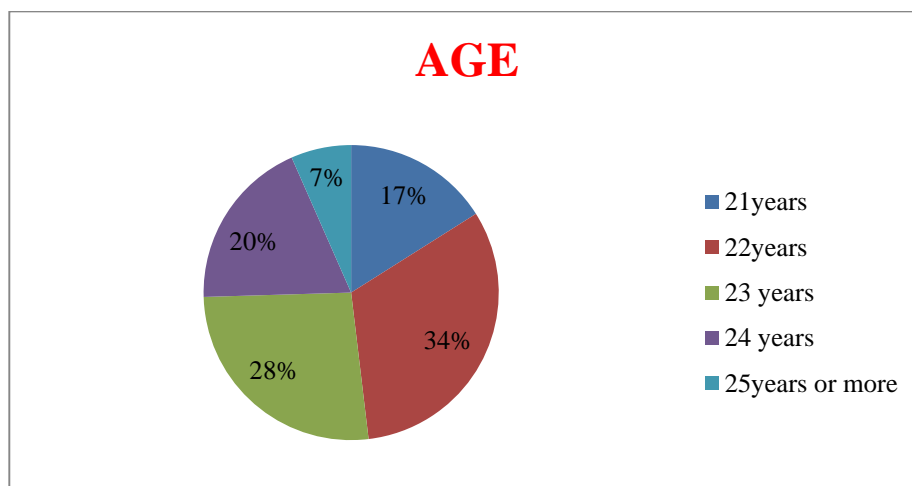


Figure 1 – Age of the Respondents

The samples that answered male and female for gender questions were 60(56.6%) and 46 (43.4%) respectively. Figure 2 shows the gender characteristic of respondents.

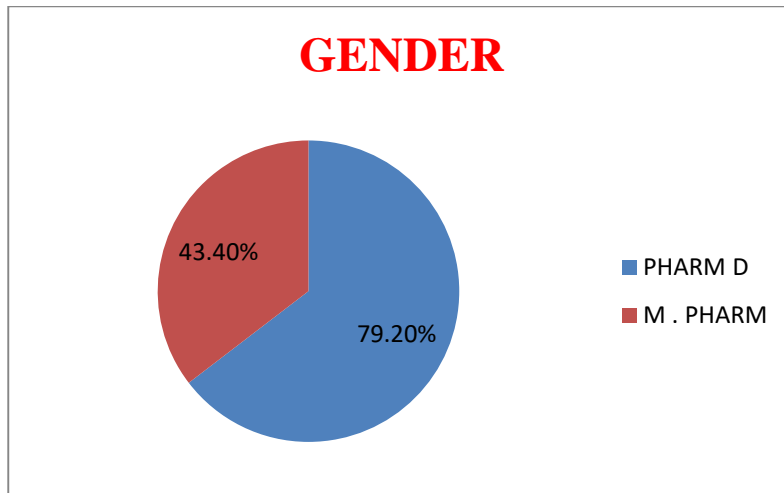


Figure 2- Gender of the Respondents

The education qualification of the students was obtained and number of sample for Pharm D students 84(79.2%) and M. Pharm students were 22(20.8%). Most of the responses were from Pharm D. Figure 3 shows the education qualification of respondents in percentage.

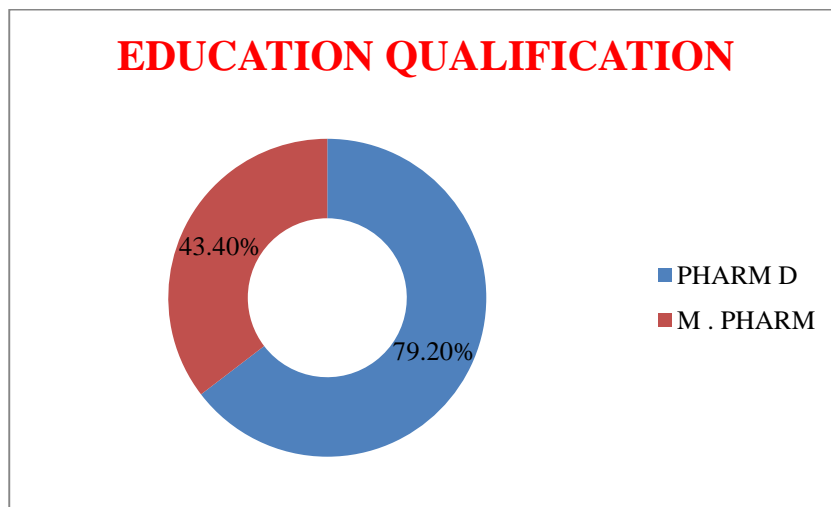


Figure 3- Education Qualification of Respondents

The year of study of the students were also obtained and number of sample for Pharm D 4<sup>th</sup> year students were 27(25.4%); for 5<sup>th</sup> year students were 27(25.4%); for 6<sup>th</sup> year students were 28(26.41%) and from M.Pharm 1<sup>st</sup> year students were 13(12.2%) and 2<sup>nd</sup> years students were 11(10.3%). Figure 4 shows the year of study of respondents in percentage

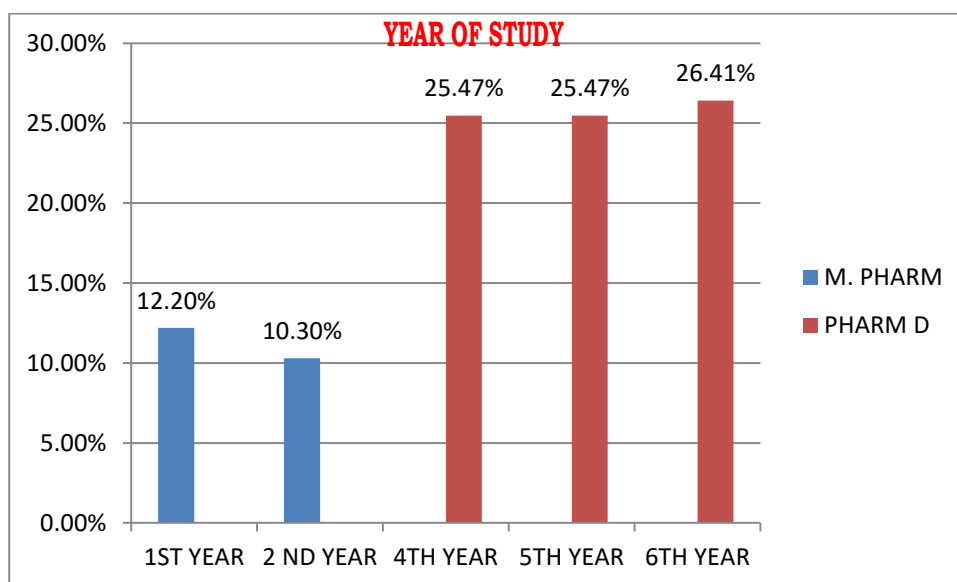


Figure 4- Year of study of Respondents

Table 1 show and summarize the responses of students about the knowledge of Gastro esophageal disease. Majority of respondent 87(82.1%) know people who experiencing with GERD. Only 19(17.9%) students doesn't know people who experiencing with GERD. Most of the students responded 76(71.7%) that GERD means acid reflux back the stomach content into esophagus and mucosal damage produced in esophagus due to abnormal reflux. Regarding causes of GERD 100(94.3%) in favour of all the factors such as food, smoking, medication and infection. Most of the 95(89.6%) felt that common symptoms experiencing by GERD patient are all the symptoms such as heartburn, regurgitation, belching and dysphasia. In addition to this, Mostly 60(56.6%) students think that maybe GERD patients have stress and anxiety. Most of the student 97 (91.5%) felt that any one of the method is the best way to confirm GERD such as symptoms, endoscopy or barium X-ray or manometry test. Majority of student 61(57.5%) enclosed that prevalence of having GERD is greater in 19-40 age group, followed by 41-60 age group 41(38.7%), 14-18 years old 12 (19%) and 2(1.9%) felt that greater than 60 years might have greater chance of GERD signs.

Table 1- Knowledge towards Gastro oesophageal reflux disease among students

S.No	Questions	Number(N=106)	Percentage
1.	What do you mean by GERD?		
	a. Acid reflux back the stomach content into esophagus	20	18.9%
	b. Mucosal damage produced in esophagus due to abnormal reflux	10	9.4%
	c. Gastric acid emptying into intestine	0	0%
		76	71.7%

---

	d.	Both a & b		
2.		Do you know anyone experiencing with GERD?		
	a.	Yes	87	82.1%
	b.	No	19	17.9%
		What is the cause of GERD?		
3.	a.	Food		
	b.	Smoking	3	2.8%
	c.	Medication	0	0%
	d.	Infection	0	0%
	e.	All the above	3	2.8%
			100	94.3%
4.		What are the common symptoms experiencing by GERD patients?	8	7.5%
	a.	Heartburn	0	0%
	b.	Regurgitation	1	0.9%
	c.	Belching	2	1.9%
	d.	Dysphasia	95	89.6%
	e.	All the above		
5.		Do GERD patients have stress & anxiety?		
	a.	Yes	44	41.5%
	b.	No	2	1.9%
	c.	Maybe	60	56.6%
6.		How do you confirm GERD in a patient?		
	a.	Symptoms	5	4.7%
	b.	Endoscopy	4	3.8%
	c.	Barium X-ray	0	0%
	d.	Manometry test	0	0%
	e.	Any one of the above	97	91.5%
7.		Prevalence of having GERD is greater in which age group? \		
	a.	14-18	2	1.9%
	b.	19-40	61	57.5%
	c.	41-60	41	38.7%
	d.	Greater than 60yrs	2	1.9%

---

Table 2 shows and summarize the responses of students about attitude towards Gastro esophageal reflux disease. Only 8(7.5%) felt that patient who experiencing GERD can't have high quality of life, where majority 85(80.2%) say that GERD patient can have quality of life. Majority of students 104(98.4%) felt that GERD if untreated may lead to several complication. Among the respondent 98(92.5%) students felt that GERD can be cured and 99(93.4%) students felt that GERD last for many years if untreated. Majority of students 79(74.5%) responded that GERD patient might have a chance of getting asthma. Majority of respondent 89(84%) felt that patient having fatty liver are at greater risk of being diagnosed with GERD and 13(12.3%) student felt it uncertainly.

Table 2- Attitude toward Gastro oesophageal reflux disease among pharmacy students

S.No	Questions	Number(N=106)	Percentage
1.	A Patient who experiencing GERD can have high quality of life.	85	80.2%
	a. Yes, I Agree	8	7.5%
	b. No, I Disagree	13	12.3%
	c. Uncertainly		
2.	Untreated GERD may lead to several complications.		
	a. Yes, I Agree	104	98.4%
	b. No, I Disagree	1	0.9%
	c. Uncertainly	1	0.9%
3.	GERD can be cured.		
	a. Yes, I Agree	98	92.5%
	b. No, I Disagree	2	1.9%
	c. Uncertainly	6	5.7%
4.	GERD last for many years if untreated.	99	93.4%
	a. Yes, I Agree	4	3.8%
	b. No, I Disagree	3	2.8%
	c. Uncertainly		
5.	GERD is a lifelong disease.		
	a. Yes, I Agree	82	77.4%
	b. No, I Disagree	14	13.2%
	c. Uncertainly	10	9.4%
6.	GERD patients are having chance of getting Asthma.		
	a. Yes, I Agree	79	74.5%
	b. No, I Disagree	11	10.4%

	c.	Uncertainly	16	15.15%
Patients having Fatty liver are at greater risk of being diagnosed with GERD.				
7.	a.	Yes, I Agree	89	84%
	b.	No, I Disagree	4	3.8%
	c.	Uncertainly	13	2.3%

Table 3 shows and summarize the responses of students about practice towards Gastro esophageal reflux disease. Majority of students 103(97.2%) felt that food such as alcohol, caffeine, citrus fruit juice and chocolate should be avoided for GERD patient.49(46.2%) students felt that exercise help to relieve GERD symptoms. Majority of respondents 102(96.2%) students think that all the measure such as lifestyle modification, medication, change in diet intake and regular exercise will help to control GERD in the patient. Majority of students 93(87.7%)felt that diet such as high fibre food, robotic food, including turmeric and ginger in food and intake of sea salt should be followed by GERD patient. 54(50.9%) student doesn't prefer OTC medication for GERD. Majority of students 83(78.3%) felt that antacid will neutralize the acid reflux in stomach. Only 3(2.8%) student choice were antacid as a first line therapy for GERD, where 9(8.5%) choice was H2 antagonist drug as a first line therapy and 19(17.9%) students felt that proton pump inhibitor as first line therapy. Majority of students 75(70.8%) felt that all drugs such antacid, H2 antagonist and proton pump inhibitor can be given as first line therapy.

Table 3-Practice toward Gastro oesophageal reflux disease among pharmacy students

S.No	Questions	Number(N=106)	Percentage
1.	What kind of foods should be avoided for GERD patients?		
	a. Alcohol	2	1.9
	b. Caffeine	1	0.9%
	c. Citrus fruit juice	0	0%
	d. Chocolate	0	0%
	e. All the above	103	97.2%
2.	Does Exercise help to relieve GERD symptoms?		
	a. Yes	49	46.2%
	b. No	53	50%
	c. Maybe	4	3.8%
3.	What measure can be taken to control GERD?		
	a. Lifestyle modification	0	0%
	b. Medications	3	2.8%

---

	c.	Change in diet intake	0	0%
	d.	Regular exercise	1	0.9%
	e.	All the above	102	96.2%
	What kind of Diet GERD patients should follow?			
4.	a.	High fiber foods	5	4.7%
	b.	Probiotic foods	7	6.6%
	c.	Including turmeric & ginger in food	1	0.9%
	d.	Intake of sea salt	0	0%
	e.	All the above	93	87.7%
5.	Do you advise to take OTC medication for GERD?			
	a.	Yes	35	33%
	b.	No	54	50.9%
	c.	Maybe	17	16%
6.	Can antacid neutralize the acid reflux in stomach?			
	a.	Yes	83	78.3%
	b.	No	2	1.9%
	c.	Maybe	21	19.8%
7.	What would be your choice of drug as first line therapy?			
	a.	Antacid		
	b.	H <sub>2</sub> Antagonist	3	2.8%
	c.	Proton Pump Inhibitor	9	8.5%
	d.	All the above	19	7.9%
			75	70.8%

---

## Discussion

Many previous studies were conducted regarding gastro esophageal reflux disease among different population group. Rania naguib et al 2020, conducted a study regarding gastro esophageal reflux disease in adult among physicians. This study shows that the physicians have score of good knowledge and have only minor controversy. Dan carted et al 2018, conducted a study between the general physicians and gastroenterology specialists, were the study shows that both Ps & GSs hold different practice style, knowledge, and attitudes on GERD. (Dan carted et al. 2018). Alshaikh om et al 2021, performed a study to find the degree of GERD knowledge among the Riyadh population, the result shows a relatively good knowledge level compared to previously reported figures in saudi arabia. Bretangne J F et al 2007, conducted a study which shows only a slightly differences in drug prescription were identified between primary care physicians

and gastroenterology. Both group perception that GERD therapy can still be improved. The study cela L. et al 2013, show a population-based study about the lifestyle and dietary intake among adult and the survey shows how GERD affect a person life.

Currently, the present study shows about knowledge, attitude and practice regarding GERD among pharmacy students. To my knowledge this was the first study conducted for the pharmacy students at Chennai to examine the knowledge, attitude and practice about GERD. The study shows that pharmacy students have 77.6% knowledge about GERD, where some participant 22.4% have to refer books, articles and internet to improve their knowledge. 57.5% student felt that GERD is greatly seen between 19-40 age groups and 80.2% student felt that GERD patient can have good quality of life. 93.4% student felt that GERD can be cured, and it shows that the student have good attitude towards GERD. From the result, it shows that 96.2% students felt that GERD can be control in the patient by following some measures regarding GERD, 78.3% student feels that antacid can neutralise the acid reflux and 70.8% felt that all drugs such as antacid, H2 antagonist and proton pump inhibitor can be given as first line therapy. This shows that pharmacy students have enough practice regarding the GERD. From the present study the result shows that pharmacy student have adequate knowledge, attitude and practice regarding GERD.

### **Conclusion**

The present study concluded that pharmacy student have adequate knowledge, attitude and practice about gastro esophageal reflux disease. The results of this study help to show the scarcity of knowledge, attitude and practice among the pharmacy students. From the result it shows that, awareness about GERD management is also good enough among the pharmacy students. Participant had good knowledge regarding GERD and its management and had enough practice regarding gastro esophageal reflux disease. Participant had good choice of drug therapy.

### **Conflict of interest**

There was no conflict of interest in this study.

### **References**

1. Bredenoord AJ, Weusten BL, Curvers WL, Timmer R, Smout AJ. Determinants of perception of heartburn and regurgitation. *Gut*. 2006 Mar 1;55(3):313-8.
2. Clarrett DM, Hachem C. Gastroesophageal reflux disease (GERD). *Missouri medicine*. 2018 May;115(3):214.
3. Flegal KM, Carroll MD, Kit BK, Ogden CL. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *Jama*. 2012 Feb 1;307(5):491-7.
4. Herregods TV, Bredenoord AJ, Smout AJ. Pathophysiology of gastroesophageal reflux disease: new understanding in a new era. *Neurogastroenterology & Motility*. 2015 Sep;27(9):1202-13.

5. Smith JL, Opekun AR, Larkai E, Graham DY. Sensitivity of the esophageal mucosa to pH in gastroesophageal reflux disease. *Gastroenterology*. 1989 Feb 1;96(2):683-9.
6. Peery AF, Crockett SD, Murphy CC, Lund JL, Dellon ES, Williams JL, Jensen ET, Shaheen NJ, Barritt AS, Lieber SR, Kochar B. Burden and cost of gastrointestinal, liver, and pancreatic diseases in the United States: update 2018. *Gastroenterology*. 2019 Jan 1;156(1):254-72.
7. El-Searag HB. Time trends of gastroesophageal reflux disease: a systemic review. *Clin Gastroenterol Hepatol*. 2007;5(1):17-26.
8. Vakil N, Van Zanten SV, Kahrilas P, Dent J, Jones R. The Montreal definition and classification of gastroesophageal reflux disease: a global evidence-based consensus. *Official journal of the American College of Gastroenterology | ACG*. 2006 Aug 1;101(8):1900-20.
9. Allampati S, Lopez R, Thota PN, Ray M, Birgisson S, Gabbard SL. Use of a positional therapy device significantly improves nocturnal gastroesophageal reflux symptoms. *Diseases of the Esophagus*. 2017 Mar 1;30(3).
10. Vela MF, Craft BM, Sharma N, Freeman J, Hazen-Martin D. Refractory heartburn: comparison of intercellular space diameter in documented GERD vs. functional heartburn. *Official journal of the American College of Gastroenterology | ACG*. 2011 May 1;106(5):844-50.
11. Lundell LR, Dent J, Bennett JR, Blum AL, Armstrong D, Galniche JP, Johnson F, Hongo M, Richter JE, Spechler SJ, Tytgat GN. Endoscopic assessment of oesophagitis: clinical and functional correlates and further validation of the Los Angeles classification. *Gut*. 1999 Aug 1;45(2):172-80.
12. DeMeester TR, Johnson LF, Joseph GJ, Toscano MS, Hall AW, Skinner DB. Patterns of gastroesophageal reflux in health and disease. *Annals of surgery*. 1976 Oct;184(4):459.
13. Wong BC, Kinoshita Y. Systematic review on epidemiology of gastroesophageal reflux disease in Asia. *Clinical gastroenterology and hepatology*. 2006 Apr 1;4(4):398-407.
14. Yadlapati R, Pandolfino JE. Personalized approach in the work-up and management of gastroesophageal reflux disease. *Gastrointestinal Endoscopy Clinics*. 2020 Apr 1; 30(2):227-38.
15. Fujiwara Y, Takahashi SI, Arakawa T, Sollano JD, Zhu Q, Kachintorn U, Rani AA, Hahm KB, Joh T, Kinoshita Y, Matsumoto T. A 2008 questionnaire-based survey of gastroesophageal reflux disease and related diseases by physicians in East Asian countries. *Digestion*. 2009; 80(2):119-28.
16. Shaheen NJ, Hansen RA, Morgan DR, Gangarosa LM, Ringel Y, Thiny MT, Russo MW, Sandler RS. The burden of gastrointestinal and liver diseases, 2006. *Official journal of the American College of Gastroenterology | ACG*. 2006 Sep 1;101(9):2128-38.
17. Carter D, Dickman R. Practice styles, knowledge and attitudes of general practitioners and gastroenterology specialists who treat gastroesophageal reflux disease. *Medicine*. 2018 Dec; 97(52).
18. BRETAGNE JF, Honnorat C, RICHARD-MOLARD B, Soufflet C, Barthélemy P. Perceptions and practices on the management of gastro-oesophageal reflux disease: results of a national survey comparing primary care physicians and gastroenterologists. *Alimentary pharmacology & therapeutics*. 2007 Apr;25(7):823-33.

19. Halpern R, Kothari S, Fuldeore M, Zarotsky V, Porter V, Dabbous O, Goldstein JL. GERD-related health care utilization, therapy, and reasons for transfer of GERD patients between primary care providers and gastroenterologists in a US managed care setting. *Digestive diseases and sciences*. 2010 Feb;55(2):328-37.
20. Peery AF, Dellon ES, Lund J, Crockett SD, McGowan CE, Bulsiewicz WJ, Gangarosa LM, Thiny MT, Stizenberg K, Morgan DR, Ringel Y. Burden of gastrointestinal disease in the United States: 2012 update. *Gastroenterology*. 2012 Nov 1; 143(5):1179-87.
21. Yadlapati R, Pandolfino JE. Personalized approach in the work-up and management of gastroesophageal reflux disease. *Gastrointestinal Endoscopy Clinics*. 2020 Apr 1; 30(2):227-38.
22. Havemann BD, Henderson CA, El-Serag HB. The association between gastro-oesophageal reflux disease and asthma: a systematic review. *Gut*. 2007 Dec 1; 56(12):1654-64.
23. Arts J, Eisendrath P, Devière J, Tack J. Empirical therapy for symptomatic gastroesophageal reflux disease in primary care: determinants of efficacy. *Digestion*. 2007; 76(3-4):207-14.
24. Labenz J, Malfertheiner P. Treatment of uncomplicated reflux disease. *World journal of gastroenterology: WJG*. 2005 Jul 28; 11(28):4291.