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Chronic Obstructive Pulmonary Disease Knowledge Analysis In High School Students

Susanthy Djajalaksana[1]✉, Aditya Sri Listyoko[1,2], Magdalena[1,2], Iqbal Muhammad[1,2], Zata Dini[1,2], Cindy Clarrisa Primaputri[1,2]

[1]Department of Pulmonology and Respiratory Medicine, Universitas Brawijaya, Indonesia
[2]Saiful Anwar General Hospital, Indonesia

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Abstract

Smoking is one of the causes of premature death and disability, and one of the diseases caused by smoking is COPD. Chronic obstructive pulmonary disease (COPD) is a major worldwide leading cause of morbidity, mortality, and disability. It also becomes the serious healthcare system's economic problem. By knowing the level of public understanding of this disease, we were able to find out what education could be given to increase COPD understanding. This study aims to determine the level of knowledge of high school students about COPD and to evaluate after being given a presentation about COPD. It is a descriptive study. The study had 95 participants and was conducted cross-sectionally. This study was conducted at the Zoom meeting on November 21, 2021. The data collection technique is that respondents filled out a Google Form. The subjects were 95 participants who had undergone COPD education, and there was a statistically significant difference in COPD knowledge before and after it ($p<0.01$). Knowledge of COPD symptoms had the greatest significant influence on education ($p<0.01$) of the COPD knowledge categories assessed.

Introduction

Smoking is one of the causes of early death and disability because cigarettes contain more than 4000 chemical compounds that are very dangerous and can be prevented. The number of smokers in developed countries has decreased, but the number of smokers in developing countries continues to increase significantly. Indonesia belongs to the group of developing countries and is one of the countries with a high number or number of active smokers. Indonesia is ranked fifth in the world with the highest number of smokers. The prevalence of male smokers in Indonesia ranks second in Southeast Asia. The first is occupied by Timor Leste. Experts estimate that the mortality rate of smokers will reach 10 million in 2030. 70% of them will come from developing countries (Keloko, 2019).

Today the problem of smoking is becoming increasingly worrying because smoking behavior in children and adolescents has an increasing number and is approaching the prevalence of smoking in adults. People do not yet have a high level of awareness about the dangers of smoking that can occur due to disease or problems due to smoking that will arise in the next 20 to 25 years since the person starts smoking (Pezzuto & Carico, 2020). The long period is the trigger for public indifference due to the dangers of smoking. In the last few decades, smoking behavior has become a social phenomenon that can be found in everyday life, not only adults but teenagers and even small children have started to do this behavior.1 The prevalence of smoking in adolescents aged 10-18 in 2013 was 7.20% and in 2018 it was 9.10%, so it can be concluded that there is an increase in the number of adolescents consuming cigarettes. The prevalence of male smokers

✉ Correspondence Address:
Department of Pulmonology and Respiratory Medicine, Universitas Brawijaya, Indonesia
Email :

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aged more than 15 years in 2018 was 62.9%. This figure holds the first place in the world in the category of male smoking rates (Fauzi et al., 2019).

One of the diseases caused by smoking is COPD. Chronic obstructive pulmonary disease (COPD) is a common condition detrimental to human health and negatively affects both the life expectancy and quality of life of patients. Over 90% of deaths due to COPD occur in countries with low-to-middle income levels. The World Health Organization (WHO) has estimated that COPD will become the third leading cause of death worldwide by 2020 (Mathers CD & Loncar D, 2006). COPD caused more than 3 million people to die in 2012, approximately 6% of all deaths globally. COPD is an important public health challenge that is preventable and treatable. COPD is a compelling cause of morbidity and mortality but is still largely underdiagnosed and undertreated (Santo & Fernandes, 2022). For now, COPD is a general cause of chronic morbidity and mortality worldwide. So many people suffer from this disease and have various complications. The most common symptoms of COPD are dyspnea, cough, and sputum production, and less common but troublesome symptoms are wheezing, chest tightness, and chest congestion. However, reported frequencies differ depending on the patient population and the severity of the disease (Miravitlles & Ribera, 2017). COPD symptoms worsen abruptly, causing acute exacerbations, which are described as episodes of clinical instability that occur in the natural course of the disease and are marked by a sustained worsening of respiratory symptoms that exceeds their daily variability. These exacerbations are common during the disease, occurring 1-4 times a year on average, and have a significant impact on health-related quality of life due to progressive disability rather than immediate death (Folch A et al., 2017) .

Patient education is a crucial component of the care and treatment of chronic illness (Posada WA et al., 2014). For chronic obstructive pulmonary disease (COPD), education means motivating, partaking, and guiding patients to adapt their behavior completely; addressing risk factors, together with smoking cessation and vaccination; and creating proper use of inhalation devices. Education additionally fosters the upkeep or increasing of physical activity and develops skills to raised manage the disease (Global Initiative for Chronic Obstructive Lung Disease, 2017). Therefore, health education favors the patient's active participation in health care and also the self-management of COPD through changes in lifestyle (Burtin C et al., 2016). It also provides data regarding physical and psychological changes caused by the disease, which encourages treatment adherence (Posada WA et al., 2014).

COPD causes the airways in the lungs to become irritated and thickened, as well as the destruction of the tissue where oxygen is exchanged. The flow of air into and out of your lungs slows down. When this happens, less oxygen enters your body's tissues, making it more difficult to expel the waste gas carbon dioxide. Shortness of breath makes it difficult to stay active as the condition progresses. Because most people will have symptoms of chronic bronchitis and emphysema, health experts prefer to refer to the disease as COPD. However, some doctors believe that chronic bronchitis can exist even if a person does not have the airway blockage associated with COPD. The diagnosis of COPD requires a comprehensive approach that comprises spirometry and the assessment of symptoms and risk factors. In most cases, the disease is characterized by a wide range of respiratory symptoms. However, three symptoms (dyspnea, cough, and sputum production) tend to be prevalent (Woldeamanuel et al., 2019). Treatment for COPD can change the disease's natural course by reducing the decline of lung function and increasing patients' overall quality of life. Because these therapies are most effective when implemented early in the course of the disease, early diagnosis and adequate treatment are critical variables in the optimal management of COPD (Bednarek M et al., 2006). Early COPD diagnosis is based on the observation of certain critical indications in the patient that necessitate appropriate tests to confirm the diagnosis (Vestbo J, 2004).

Education, learning, and selfmanagement are all linked processes that must be completed to achieve behavior change and,

eventually, improved health. We recognize that this paradigm is oversimplified. In reality, the process is not solely unidirectional due to the changes in health education status may necessitate the acquisition of new knowledge and skills, necessitating the patient to complete additional education and learn to modify and develop new self-management strategies and behavior change (Holman H & Lorig K, 2004). It is expected that health education will have an impact on five possible patient domains: 1) knowledge; 2) perception of benefit; 3) health beliefs; 4) health behaviors; and 5) health outcomes (Wang et al., 2022). Two studies assessed the impact of education on knowledge acquisition and found that public relations education improves health knowledge. Relationships between knowledge and any of the other aforementioned areas have yet to be investigated in COPD patients (White R et al., 2006).

Methods

It was a descriptive study. The study had 95 participants and was conducted cross-sectionally. This study was conducted at the Zoom meeting on November 21, 2021. The Committee on Health Research Ethics has approved this study, giving it the number 400/207/K.3/302/2021. Those who completed the Pretest and Posttest forms met the inclusion criteria for this study. Those who did not want to participate and did not complete the Pretest or Posttest forms were excluded from the study. There were two variables in this study: an independent variable and a dependent variable. The dependent variables in this study are understanding or knowledge of COPD in subjects, while the independent variables are the latest education and age. Respondents filled out a Google Form on their phone or laptop as part of this study's data collection method. Informed consent and questionnaires containing the respondent's identity data and many multiple-choice questions were included in the Google Form. Informed consent is utilized to offer respondents knowledge about the study's goal and procedures. This information is supplied to individuals to decide whether or not to participate in this research project. Personal information about the respondent, such as age, gender, last education, smoking history, and COPD history. The Bristol COPD knowledge questionnaire was amended to include 24 multiple-choice items. There are six kinds of questions in this set of multiple-choice: comprehending the definition of COPD, diagnosis of COPD, COPD risk factors, COPD symptoms, COPD therapy, and COPD prevention. Each category contains four statements that must be answered with one of three options: "True," "False," or "Don't Know." Each correct response is worth one point, so if the Respondent answered all of the questions correctly, he or she would receive four points. As a result, any response that is incorrect or replied with "Don't Know" will receive a 0 score. The points earned by each respondent were then tallied using Excel software. The Chi-Square test with SPSS version 26 software was used to analyze the data in this study, rather than the calculation of each category containing true or false.

Result and Discussion

This study involved a total of 95 subjects who had met the inclusion criteria set with the demographic data shown in Table 1. From the demographic data, we got an even distribution by gender where in the medical group, 72 people (75%) subjects were male and 23 people (25%). We got Students in Class X 42 people (45%), Class XI 24 people (25%), and Class XII 29 people (30%). Additionally, we obtained 7 smokers in all our subjects. The smoking factor in this study may not directly affect knowledge about COPD because subjects may be healthy subjects who have never been diagnosed with COPD.

Table 1. Demographic Data

Variables	Respondents
Gender	
-Male	72 (75%)
-Female	23 (25%)
Smoker	
-Yes	7 (8%)
-No	88 (92%)
Class Degree of student	
- Class X	42 (45%)
- Class XI	24 (25%)
- Class XII	29 (30%)

The questionnaire used in this study is a modification of the Bristol Questionnaire. It has often been used in various studies on COPD. The language we use is Indonesian. So easily understood by both medical and non-medical group subjects. We use this questionnaire for Pretest and Posttest. One of the main reasons for the BCQ's design was the lack of a tool that provided a single center for quantifying COPD information. In the QQ, correct answers are marked with a 1, and incorrect answers are marked with a 0. The total number of successfully confirmed items, or the %, will then be determined. "When elements are combined to form a ladder, they must have an internal agreement," Bland and Altman write. All things must have the same measurement; hence they must be connected. The items on the BCKQ measure knowledge. Therefore it wouldn't be surprising if individuals who were "well informed" did well in certain areas and those who were "poorly educated" did poorly in others, i.e., a desirable quality of a knowledge questionnaire was the most accurate. Internal consistency establishes a positive relationship between the variables. This BCKQ had three options (true/false/don't know). Finding out what subjects know or don't know about the questions, or what they think they know but don't, is crucial. As a result, a "don't know" option was provided as a response option. We consider "don't know" to be the incorrect answer during the statistical analysis because we want to ensure that the accurate answer comes from what they truly know about COPD, not from speculative thoughts. The average score in the pretest was 50,96%, showing that overall knowledge was weak. The issue is perhaps excessively complex, and the level of expertise expected is unreasonably high. However, we have carefully considered the problems with poor knowledge and have concluded that they are related to sectors where knowledge demands are high and where knowledge goes beyond a certain degree.

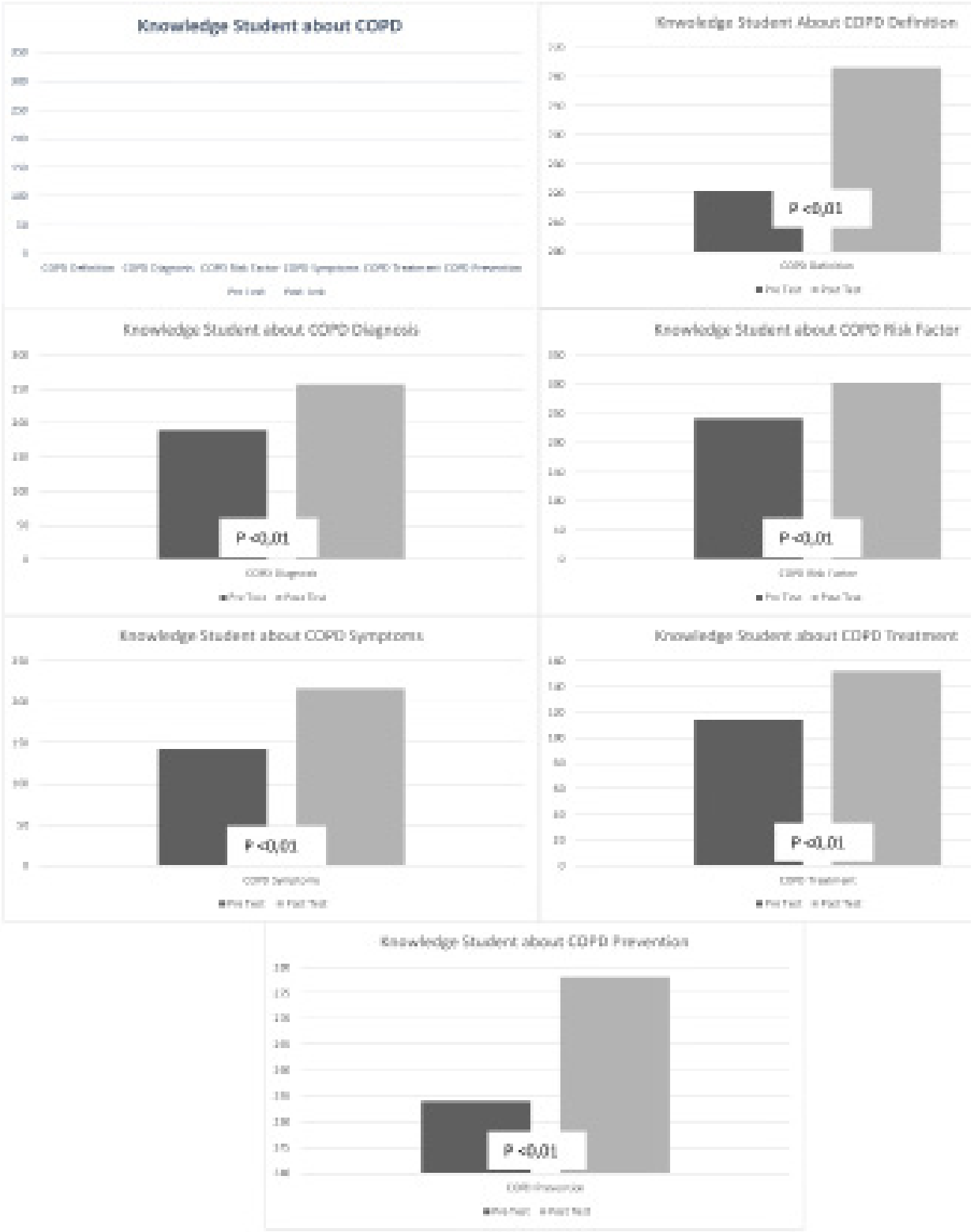

Figure 1. Comparison between Pre Test and Post Test regarding Knowledge Student ab COPD

The results of the analysis we obtained regarding the comparison of the six categories of questions about understanding COPD between Pretest and Posttest are presented in Figure 1.

Table 2. The Comparison between Pre Test and Post Test regarding Student's Knowledge about COPD

Variable	Category	Proportion	P Value
Student's Knowledge about COPD Definition	Pre Test	221	P<0.01
	Post Test	263	
Student's Knowledge about COPD Diagnosis	Pre Test	189	P<0.01
	Post Test	257	
Student's Knowledge about COPD Risk Factor	Pre Test	241	P<0.01
	Post Test	303	
Student's Knowledge about COPD Symptoms	Pre Test	143	P<0.01
	Post Test	216	
Student's Knowledge about COPD Treatment	Pre Test	114	P<0.01
	Post Test	152	
Student's Knowledge about COPD Prevention	Pre Test	254	P<0.01
	Post Test	278	

From the perspective of the total score of the COPD definition understanding category, this category has 4 problems, namely COPD or delayed lung. The term "chronic" means severe; COPD usually worsens over time; COPD hinders daily activities; COPD is a genetic disease. We got a total correct score is 221 (58,16%) in the Pretest group. After the education and doing the post-test, we got the correct score is 263 (69,2%). The analysis results showed that compared between Pretest and post-test, there was a significant difference in the understanding of COPD definition between the Pretest and post-test group (58,16% vs 69,2%), with a p-value of <0.001. So with this data, we can see that with education, knowledge about the definition of COPD can be better.

Shortness of breath is generally caused by narrowing of the respiratory tract in the COPD diagnosis category, which has four questions; COPD can only be confirmed by pulmonary function tests (spirometry); blood oxygen levels are always low in COPD; One of the most prevalent symptoms of COPD is wheezing. In the Pretest group, we received a total correct score of 189 (49,7%), and 257 (67,6%) in the Posttest group. This category was incorrectly answered by over 50% of the subject. The most common symptom of COPD is shortness of breath, which is caused by constriction of the bronchial airways, and wheezing can also occur. A breathing test confirms the diagnosis of COPD (spirometry). The findings revealed a significant difference in knowledge of the diagnosis category of COPD between the Pretest and post-test groups (49,7% vs 67,6%) with a p-value of 0.001.

COPD is most common in adults over 40 years old, according to the COPD risk factor category, which has four questions. Smoking reduces lung damage; nonetheless, it increases the risk of lung cancer. Exacerbations of COPD can be exacerbated by infection. In the Pretest group, we got a total correct score of 241 (63,4%) for COPD, which causes repeated lung infections. Meanwhile, there were 303 total correct scores (79,7%) in the Post-test group. The research revealed a significant difference in knowledge between the Pretest and post-test groups (63,4% vs 79,7%) with a p-value of 0.001 for the risk factor category of COPD.

The symptoms that frequently appear in COPD are swelling of the ankles, and the symptoms that frequently appear in COPD are weariness; there are four questions in this area. In the Pretest group, we had 143 total correct scores (37,6%), and 216 total correct scores (56,8%) in the Post-test group. We could see that the student still didn't fully comprehend the

signs of COPD, which is a sickness that starts with a respiratory tract and organ problem but can lead to heart organ complications. The results of the analysis revealed a substantial difference in comprehension between the Pretest and post-test groups (37,6% vs 56,8%), with a p-value of 0.001 for the symptom category of COPD.

In the COPD therapy area, there are four questions: removing phlegm can be aided by breathing exercises; bronchodilator drugs can help COPD patients clear phlegm; and in mild COPD, antibiotic therapy is frequently required. In the Pretest group, we had 114 total correct scores (30%) and 152 total correct scores (40%) in the Post-test group, where there was an increasing percentage of about 10% after the subject received an education. The data in the therapy category revealed the need for increased education to comprehend COPD treatment. Twenty-eight non-medical people get it right, which could be related to their experience as COPD sufferers or their families who help them care for the disease. The research revealed a substantial difference in knowledge between the Pretest and post-test groups (30% vs 40%) with a p-value of 0.001 when it came to the COPD therapy category.

In the COPD preventive area, there are four questions: quitting smoking always improves lung function; influenza vaccine is suggested once a year; and Walking is an excellent way to increase fitness. Exercise does not need to be halted if it causes COPD patients to get short of breath, according to the pretest group, which had a 254 total correct score (66,8%), and in the post-test group which had a 278 total correct score (73,2%). It's encouraging to see that more than the student was already aware of COPD prevention strategies. As we all know, the best method to avoid the onset of the disease and its progression is to implement a preventative program. In the preventative category of COPD, the findings of the analysis revealed a significant difference in knowledge between the Pretest and post-test groups (66,8% vs 73,2%) with a p-value of 0.001.

Table 3. The Correlation between Education and Student's Knowledge about COPD with Spearman Correlation

Variables	P-Value	Correlation Coefficent
Student's Knowledge about COPD Definition	P=0.42	0.06
Student's Knowledge about COPD Diagnosis	P=0.07	0.13
Student's Knowledge about COPD Risk Factor	P=0.04	0.15
Student's Knowledge about COPD Symptoms	P=0.72	0.02
Student's Knowledge about COPD Treatment	P=0.42	0.06
Student's Knowledge about COPD Prevention	P=0.74	0.02

COPD was previously understood by 50,96% according to the total score of the six categories. But after we gave education about COPD and repeated the questionnaire, data showed that the knowledge of the student increased, based on the elevated total score compared the pretest score. We get statistical significance (p=0.001) in all categories as a consequence of the analysis. The participants' lack of understanding of COPD demonstrates a depth of COPD education and counseling in the community. The patient's failure to seek treatment promptly may be due to a lack of information about the early symptoms of COPD.

Table 3 shows no correlation between education and students' knowledge about the definition, diagnosis, symptoms, treatment, and prevention of COPD with a p-value of each category 0,42; 0,07; 0,72; 0,42; 0,74. Also in that table, we can see the correlation between education and students' knowledge about the risk factor of COPD with a p-value of 0,04 and a correlation coefficient of 0.15. The participant knows about the risk factor of COPD because there is a similar respiratory risk factor with other pulmonary diseases, such as smoking, age of more than 40 years old, and infection. But they didn't know what exactly COPD is, based on the evidence of pre and post-test results.

The questionnaire can be utilized in a variety of ways. The BCKQ could be used to assess a person's level of knowledge. Incorrect responses or "don't know" responses show a

lack of understanding that requires further study. It looked to be useful for BCKQ as a basis for discussion and teaching material; as a result, it can also be information for a society that can help to avoid COPD by reducing risk factors such as smoking and monitoring their health status if they have COPD symptoms (White R et al., 2006).

Our research reveals that there are important to give education about COPD at an early age. With simple explanation can make participants understand and aware of the importance of COPD and the associated with smoking. This fact could be the first step toward the creation of an integrated COPD training program, bridging the knowledge gap and allowing individuals to learn more about COPD shortly. Level of knowledge is an important short-term outcome of self-management education intervention because the increase in the knowledge level may act as a mediator of the improvement in long-term clinical outcomes of hospitalization, exacerbation frequency, and management (Wong & Yu, 2016). Patient education within the framework of chronic disease self-management has been shown to improve the pattern of medication use, enhance behavioral changes based on a collaborative action plan and reduce healthcare utilization in people at risk of hospitalization (Hill et al., 2010).

Health professionals recommend public education about COPD. There is no satisfactory instrument for measuring knowledge and assessing educational outcomes. The multiple choices questionnaire (BCKQ) was designed and tested, and its validity and consistency were assessed. A copy of the multiple-choice questionnaire is provided in the appendix. The questionnaires were assessed by the lay public and health professionals (Pezzuto & Carico, 2020). Health professionals' gaps in knowledge could inadvertently impact patients' knowledge and understanding of their condition and subsequently the ability of patients to effectively self-manage their COPD. Identifying gaps in knowledge can encourage Health professionals' education and training to enhance Health professionals' knowledge and subsequent patient care (AG Davitson & L Jongepier, 2012). Various patient benefits associated (though not necessarily causal) with receiving a self-management plan, including increased medication adherence, greater disease knowledge, increased attendance of training courses and support groups, and improved quality of life (Khan et al., 2017).

Conclusion

From our research, we found an increase in high school students' knowledge of COPD. We hope that in the future, the public will be educated about COPD and the importance of the community being familiar with COPD and taking preventive and treatment steps as soon as feasible.

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