Assessing the Relationship between Students' Knowledge and Smoking Habits-Related to the Risk of Bronchitis at Escola Secundária Geral 10 De Dezembro, Comoro, Dili, Timor-Leste, 2024

Jesuina Moreira Gaio Da Cruz[1]; Avelino Guterres Correia[1;2];
Manuel Francisco Soares[1]; Cipriano Do Rosario Pacheco[1]

[1]Faculty of Public Health and Medical, Sciences, Universidade da Paz, Díli, Timor-Leste
[2]Ministry of Health, Timor-Leste

Abstract:

➤ *Introduction:*

Bronchitis, a respiratory disease characterized by inflammation of the bronchial tubes, poses significant health risks, particularly among adolescents. With rising smoking rates among youth, understanding the relationship between student knowledge of smoking and its associated risks is crucial.

➤ *Objective:*

This study aims to assess the correlation between students' awareness of smoking-related health risks, particularly bronchitis, and their smoking behaviours at Escola Secundária Geral 10 de Dezembro in Comoro, Dili, in 2024.

➤ *Research Method:*

A quantitative cross-sectional approach was employed, targeting 345 students. Using the Taro Yamane formula, 40 respondents were selected. Data was collected through interviews and questionnaires, and analyzed using IBM SPSS Version 21, focusing on univariate and bivariate analyses.

➤ *Results & Discussion:*

Findings revealed that 85% of students exhibited poor knowledge regarding the dangers of smoking and its link to bronchitis. Only 17.5% reported good smoking habits, while 82.5% displayed harmful smoking behaviours. A significant Chi-Square value of 11.037 (p < 0.001) indicated a strong correlation between knowledge levels and bronchitis risk, confirming that increased awareness is associated with reduced smoking prevalence and associated health risks.

➤ *Conclusion:*

The study highlights a critical need for enhanced health education programs targeting smoking awareness and respiratory health among adolescents. Improving knowledge can potentially mitigate smoking rates and reduce the incidence of bronchitis, underscoring the importance of collaborative efforts from educators and health advocates to implement effective interventions.

Keywords: Bronchitis, Smoking Habits, Health Knowledge, Adolescents, Public Health, Respiratory Diseases, Education Interventions.

I. INTRODUCTION

Bronchitis is a respiratory disease that primarily affects the bronchial tubes, which are the air passages that transport air from the throat to the lungs. This condition occurs when the bronchi become inflamed or irritated due to an infection, often viral; however, bacterial infections and environmental irritants, such as smoke, pollution, and allergens, can also contribute to its development (Smith et al., 2022).

When irritants affect the bronchial walls, the body reacts by producing an increased volume of mucus to safeguard the airways. This surplus mucus can cause symptoms like a persistent cough, wheezing, shortness of breath, and chest discomfort as the body tries to clear the mucus and unclog the airways (Jones & Lee, 2021). If untreated or in instances of chronic bronchitis, this condition can result in considerable breathing challenges and may lead to more serious respiratory problems (Brown, 2020).

Bronchitis is an infection that affects the respiratory system, marked by inflammation in the tracheobronchial region. It is generally divided into two categories: acute bronchitis and chronic bronchitis. Acute bronchitis can occur in people of any age, while chronic bronchitis usually manifests in adults (Depkes RI, 2005). Acute bronchitis is mainly caused by a viral infection, while chronic bronchitis typically stems from bacterial infections (Miller et al., 2019).

Bronchitis can result from infections like throat inflammation and often exhibits symptoms such as coughing, breathing difficulties, and excess mucus. It may occur on its own or as a complication of ongoing lung diseases, including tuberculosis. In adults, bronchitis can progress to chronic lung failure, and instances of acute bronchial inflammation can worsen the condition, potentially leading to severe complications or death (Francisco, 2016).

Various factors can contribute to bronchitis, such as smoking, heavy alcohol use, a compromised immune system, and poor environmental conditions (American Lung Association, 2021). Smoking is particularly alarming, as it has become a widespread behavior among young people today (World Health Organization, 2020). In the past, older adults were primarily the ones who smoked. However, globalization has resulted in a rise in smoking among school-aged children, from pre-secondary to secondary levels (Centers for Disease Control and Prevention, 2019). Disturbingly, some elementary school children are already aware of how to smoke (National Institute on Drug Abuse, 2021). Smoking crosses social classes and makes cigarettes readily available (Campaign for Tobacco-Free Kids, 2022). Smokers can be found in a variety of environments, including communities, workplaces, healthcare facilities, public transport, and schools (World Health Organization, 2020).

Awareness of smoking significantly affects individuals' behaviors related to this habit. High school students who comprehend the risks associated with smoking are more likely to avoid starting or to quit the habit. On the other hand, a lack of knowledge about the harmful effects of smoking can result in reduced recognition of the health risks involved (Handayani, 2019).

A key element of knowledge regarding smoking is its effect on health. Research has demonstrated that smoking can lead to various illnesses, including cancer, cardiovascular disease, respiratory issues, and other health problems. The nicotine in tobacco, along with its other properties, complicates the process for individuals trying to quit smoking (Joemana, 2004).

The smoking behaviors of students are shaped by their parents, friends, personality traits, and information from social media that promotes cigarettes. Peer influence is particularly significant for students since they often spend most of their time with friends. Among young smokers, 87% have at least one friend who smokes, which is also seen in non-smoking youth (Subanada, 2004).

Awareness of smoking significantly affects individuals' behaviors related to this habit. High school students who comprehend the risks associated with smoking are more likely to avoid starting or to quit the habit. On the other hand, a lack of knowledge about the harmful effects of smoking can result in reduced recognition of the health risks involved (Handayani, 2019).

A key element of knowledge regarding smoking is its effect on health. Research has demonstrated that smoking can lead to various illnesses, including cancer, cardiovascular disease, respiratory issues, and other health problems. The nicotine in tobacco, along with its other properties, complicates the process for individuals trying to quit smoking (Joemana, 2004).

The smoking behaviors of students are shaped by their parents, friends, personality traits, and information from social media that promotes cigarettes. Peer influence is particularly significant for students since they often spend most of their time with friends. Among young smokers, 87% have at least one friend who smokes, which is also seen in non-smoking youth (Subanada, 2004).

Smoking is a cause of various diseases, though the effects might not be immediately felt; over time, it can damage the body significantly. This impact is not limited to active smokers; individuals around them who inhale cigarette smoke indirectly are also at the same risk, making them passive smokers or secondhand smokers. Many people mistakenly believe that passive smoking is safe (Istiqoma, 2003).

Cigarette smoke not only harms the health of smokers but can also damage the environment and affect those nearby. Research shows that cigarette smoke contains organochlorine poisons that can promote the growth of the bacterium Klebsiella pneumoniae, which is known to cause chronic bronchitis (Lestari et al., 2021).

The diseases that may develop depend on the level of harmful substances present, the duration of smoking, and how

cigarettes are smoked (World Health Organization, 2020). As a person begins to smoke, the risk of developing diseases increases with age (National Institute on Drug Abuse, 2021).

Although smokers may perceive some benefits from smoking, like alleviating stress, experiencing joy, and building camaraderie with coworkers, it can nonetheless have a severe negative impact on their health (Baker et al., 2020). Smoking is linked to bronchitis and various other diseases related to tobacco use, as well as draining financial resources.

The World Health Organization (WHO, 2021) advocates for effective strategies to diminish tobacco use, such as establishing a smoke-free environment and prohibiting all types of tobacco advertising, promotion, and sponsorship. Additionally, the WHO recommends implementing high taxes on cigarettes and other tobacco items to make them less accessible, particularly to students.

The Annual Global Burden of Disease (GBD) study reported that tobacco use leads to the premature deaths of 8.7 million individuals annually (Institute for Health Metrics and Evaluation, 2023). Out of these fatalities, 7.7 million results from smoking, while 1.3 million are linked to exposure to secondhand smoke (World Health Organization, 2021). Among the 56,000 individuals who die each year due to chewing tobacco, a significant majority—71%—are men who succumb to cigarette smoking (National Cancer Institute, 2020). The rate of deaths associated with smoking-related illnesses tends to be higher in Asia and Eastern Europe, frequently surpassing 100 and, in certain instances, even

exceeding 150 deaths per 100,000 individuals in 2023 (World Health Organization, 2023).

The National Tobacco Control Alliance of Timor-Leste (ANCT-TL) reported that in Timor-Leste, the percentage of tobacco users stands at 62%, with the highest prevalence among children under 17 at 30.9% as of 2023 (ANCT-TL, 2023). The country also experiences an annual hospitalization rate of 30,000, with 20% of fatalities occurring among individuals in their productive years (Ministry of Health Timor-Leste, 2023).

As per the findings of the 2014 National Survey for Non-Communicable Disease Risk Factors and Injuries, which utilized the WHO methodology in Timor-Leste, over half (56%) of adults reported using some type of tobacco product. Tobacco consumption was significantly higher among men (70.6%) compared to women (28.9%). Within the surveyed group, 48.6% were smokers, while 19.8% used smokeless tobacco. A greater proportion of men (69.5%) smoked tobacco than women (9.6%), whereas more women (26.8%) than men (16.1%) opted for smokeless tobacco products. Almost 90% of adults reported exposure to secondhand smoke at home, and over half of adults (51%) were subjected to secondhand smoke in their workplaces. Respondents typically began smoking quite early, with the average age of initiation being 16.4 years (Martins et al., 2015).

The figure below illustrates tobacco users by sex and type of tobacco in Timor-Leste in 2014.
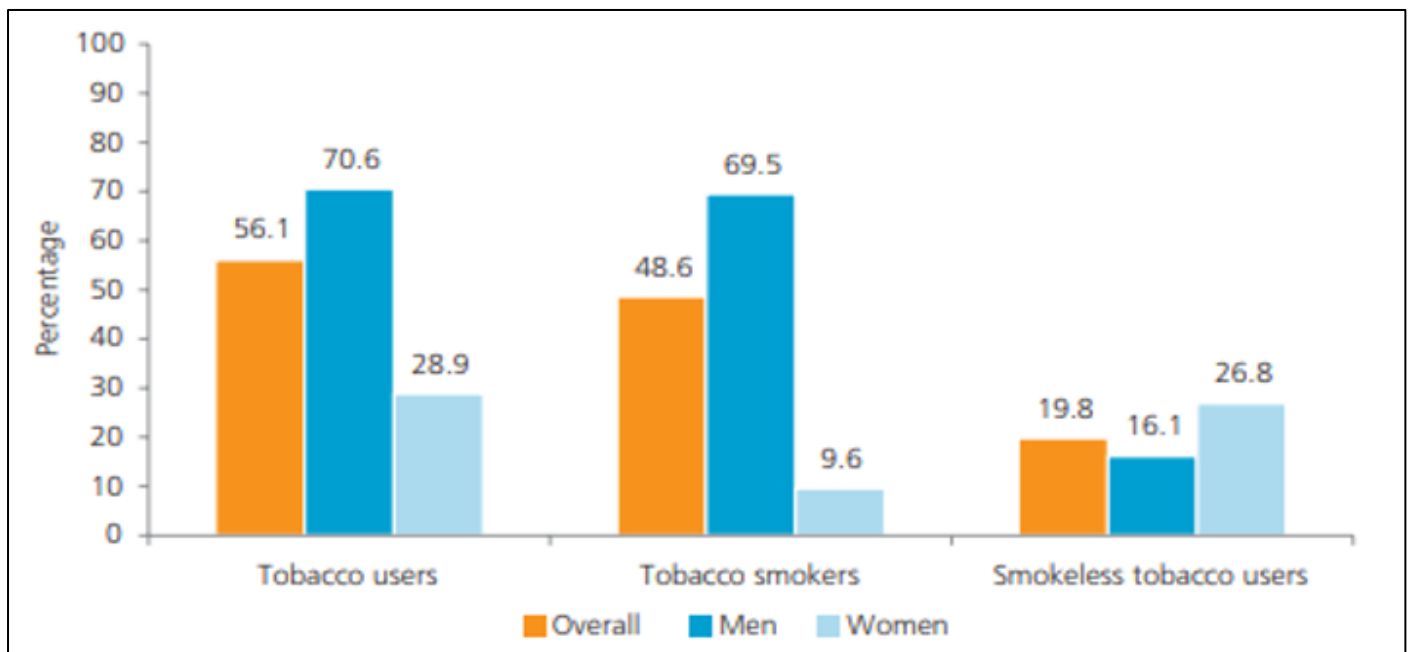

Fig 1 Illustrates Tobacco users by Sex and Type of Tobacco in Timor-Leste in 2014
Source: Martins, J. S., et al. (2015)

According to data reported by the Guido Valadares National Hospital (HNGV, 2023), there has been a noteworthy trend in the incidence of bronchitis among individuals aged 15 to 45 over the past few years. In 2021, the hospital recorded 126 cases of bronchitis within this age

group. This number saw a significant increase in 2022, with 424 reported cases, indicating a rise in respiratory health issues. The trend continued into 2023, where the hospital documented 441 cases, suggesting a growing concern for bronchitis among young adults. Further insights were

revealed in the First-Quarter Report of 2024, which showed a dramatic escalation, with 2,028 cases of bronchitis reported. This alarming spike raises questions about environmental factors, lifestyle choices, and healthcare access that may contribute to the rising incidence of this condition.

In light of the pressing public health issues associated with smoking, the writer seeks to delve into the title: "Assessing the Relationship Between Student Knowledge and Smoking Habits-Related to the Risk of Bronchitis at *Escola Secundária Geral 10 de Dezembro* Comoro, Dili, 2024." This exploration aims to assess how students' awareness of the health consequences of smoking, particularly its link to bronchitis, influences their smoking behaviors. The study will focus on the demographic of secondary school students, examining factors such as their educational background, social influences, and access to health information, to determine the extent of their knowledge regarding smoking risks and how that knowledge correlates with their smoking habits. The findings will be crucial in understanding the public health implications of education on smoking. They may inform future interventions aimed at reducing smoking rates and preventing respiratory diseases among adolescents.

General Objective is to investigate the extent of knowledge and smoking habits among students at *Escola Secundária Geral 10 de Dezembro* in the year 2024, focusing on their relationship to the risk of developing bronchitis. Specific Objectives is: 1. To examine students' awareness regarding the dangers of smoking and its associated risks for bronchitis and 2) To analyze the prevalence of smoking habits among students and how these behaviors contribute to the likelihood of bronchitis at *Escola Secundária Geral 10 de Dezembro,* Comoro, Dili, Timor-Leste, 2024.

II. RESEARCH METHOD

➢ *Designing Research*

The research method implemented in this study is quantitative and employs a cross-sectional approach, utilizing data obtained through the research instrument. This research was conducted at *Escola Secundária Geral 10 de Dezembro,* Comoro in the year 2024.

➢ *Population and Sample*

The group of individuals focused on in this study comprises students from *Escola Secundária Geral 10 de Dezembro*, Comoro, totalling 345 students. According to Sugiyono (2018), a sample serves as a smaller representation of the population, both in terms of quantity and characteristics. In this research, the sample size was determined using the Taro Yamane formula, resulting in a total of 40 respondents. The study employed simple random sampling for participant selection.

➢ *Data Collection Techniques and Tools*

In the field of research methodology, employing efficient data collection methods is crucial for obtaining valuable insights and comprehending intricate phenomena. There are various methods categorized into specific groups,

with each fulfilling a distinct role in the research process, such as:

● *Interviews:*

Interviews serve as an essential method for data collection, allowing researchers to connect with participants to delve into particular questions or subjects (Creswell, 2014). This approach is especially useful in the early phases of a study, where researchers aim to define the issues, they plan to explore (King & Horrocks, 2010). By engaging directly with respondents, the researcher not only collects data but also enhances their comprehension of the individuals' viewpoints, drives, and experiences (Rubin & Rubin, 2012).

● *Questionnaires:*

The application of questionnaires is a significant method of data collection, characterized as a planned series of written inquiries intended for respondents to answer. Generally, these inquiries may feature multiple-choice answers that offer clear alternatives for the participants. Questionnaires are beneficial for collecting information from a large sample of individuals in an economical way and can support quantitative analysis (Dillman et al., 2014). Since they are pre-prepared, they ensure uniformity in the data collection process, which simplifies the comparison of findings across various subjects (Fowler, 2014).

● *Observation:*

Observational methods are recognized for their distinct features, which differentiate them from interviews and surveys. This approach entails the researcher directly watching participants in their usual surroundings, facilitating the gathering of immediate data about behaviors and interactions. Such on-site observations can provide priceless insights, especially in grasping the context within which particular actions take place (Angrosino, 2007). By observing events as they happen, researchers can uncover patterns and dynamics that may not surface through other data collection techniques (Kawulich, 2005).

● *Documentation:*

Documentation is a crucial technique for data collection that entails gathering and examining existing records, reports, or other relevant materials associated with the research subject. This may encompass a wide range of sources, including historical documents, organizational records, and policies (Mack et al., 2005). Utilizing documentation allows researchers to tap into a vast array of information that supplements other methods of data collection. It establishes a foundational basis that can reinforce the results obtained from interviews, questionnaires, and observations, thereby improving the overall reliability of the research (Bowen, 2009).

➢ *Data Analysis Techniques*

According to Sugiyono (2019), techniques for data analysis represent a structured and methodical approach for managing the complexities that arise during the gathering and processing of qualitative data, which is obtained through interviews, field notes, and various types of documentation. This process consists of several important steps: initially, the

data is carefully categorized into specific groups, which aids in achieving a clearer understanding of the information (Yin, 2018). Next, the organized data is described and converted into models that visually illustrate the findings, providing deeper insights (Creswell & Poth, 2017). Crucially, researchers must identify data that is significant for the study—those elements that contribute the most value in answering the research questions (Patton, 2002)—and ultimately, they formulate conclusions that integrate the insights, making the results understandable and accessible to both researchers and their audience (Stake, 2010).

Following this comprehensive collection process, the analysis will be executed using the IBM SPSS Version 21 application. The analysis will unfold in the following manner:

- *Univariate Analysis:*
  This initial stage focuses on examining each independent variable individually, detailing the frequency

distribution to reveal patterns and trends (Notoatmodjo, 2018).

- *Bivariate Analysis:*
  This method employs the statistical Chi-Square test to explore the relationship between two distinct variables, thereby assessing the existence, strength, and direction of their association (Notoatmodjo, 2018). This analytical approach not only enhances understanding but also provides a solid foundation for drawing meaningful conclusions from the data.

III. RESEARCH RESULTS AND DISCUSSION

➢ *Research Results*
  The study lasted one month and took place at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, Timor-Leste, 2024. A total of 40 students were selected from a pool of 345 students.

Table 1 Frequency Distribution of Students by Age at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, 2024

Age group	Frequency	Percentage
15-17	30	75%
18-20	10	25%
Total	40	100%

Source: Primary Data (2024)

The results indicated that the majority of the student population is younger, with a significant number in the 15- to 17-year-old range. Within this group, there are 30 students, which accounts for a remarkable 75% of all enrolled students. This figure demonstrates that three-quarters of the school's attendees are individuals belonging to this younger age bracket.

In contrast, the 18-20 age group consists of just 10 students, making up 25% of the overall enrollment. This considerable difference underscores a notable age disparity among the student body, suggesting a probable trend where

older students may be finishing their studies early, choosing to leave the school, or potentially finding its programs less appealing.

The school has a total enrollment of 40 students, calculated by adding both age categories together. The dominance of younger students implies that the high school may be oriented explicitly toward this age demographic. This feature could reflect the types of programs available, which might resonate more with younger learners, potentially aligning with conventional secondary education offerings.

Table 2 Frequency Distribution of Knowledge at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, 2024

Alternate Answer	Frequency	Percentage
Good	6	15%
Bad	34	85%
Total	40	100%

Source: Primary Data (2024)

The table outlines the distribution of knowledge levels among students at Escola Secundária Geral 10 de Dezembro in Comoro, Dili, for the year 2024. It classifies the students' knowledge into two primary categories: "Good" and "Bad."

The data shows that a very small number of students, specifically 6 individuals, demonstrated a "Good" level of knowledge. This accounts for only 15% of the entire surveyed student population. On the other hand, a large majority of 34

students, representing 85%, were identified as having a "Bad" level of knowledge.

This distribution highlights a troubling trend regarding the overall comprehension and mastery of the subject among the students. The high percentage of students classified as having a "Bad" level of knowledge suggests potential issues with the educational approaches, effectiveness of the curriculum, or possibly external factors impacting the learning environment.

Table 3 Frequency Distribution of Smoking Habits of Students at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, 2024

Alternate Answer	Frequency	Percentage
Good	7	17.5%
Bad	33	82.5%
Total	40	100%

Source: Primary Data (2024)

The provided table presents a frequency distribution of the smoking habits of students at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, for the year 2024.

The survey captures the smoking behaviors of a total of 40 students. Among these, 7 students, which represents 17.5% of the sample, indicated that they have good smoking habits. This implies that a small portion of the students either refrain from smoking or smoke in a socially acceptable way, potentially pointing to a reduced risk of addiction or adverse health effects.

On the other hand, a substantial majority of the students, totaling 33, which equates to 82.5% of the respondents, claimed to have poor smoking habits. This concerning figure reveals a troubling trend among the student body, as these individuals may participate in behaviors that are harmful to their health and wellness.

The findings highlight the necessity for targeted initiatives and educational outreach aimed at lowering smoking rates and encouraging healthier choices among students. It also indicates that smoking is a widespread issue in this group, necessitating further exploration into the underlying factors contributing to these behaviors. Overall, the smoking habits of these students point to an urgent public health challenge that requires attention.

Table 4 Frequency Distribution of Respondents Regarding the Relationship of Knowledge to the Risk of Bronchitis at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, 2024

Knowledge	Risk of Bronchitis				Total		Chi-Square	P=Value
	No Risk	%	Risk	%	Total	%		
Good	5	12.5	1	2.5	6	15	11.037	0.001
Bad	6	15.0	28	70.0	34	85		
Total	11	72.5	29	27.5	40	100		

Source: Primary Data (2024)

The data presented in Table 4 examine the relationship between knowledge and the risk of bronchitis among respondents at Escola Secundária Geral 10 de Dezembro, Comoro, Dili, in 2024. The table categorizes respondents based on their level of knowledge (good or bad) and the associated risk of bronchitis (no risk or risk).

Out of the total respondents, a significant majority exhibited poor knowledge regarding bronchitis, with 85% classified as having "bad" knowledge. Specifically, 5 respondents (12.5%) with good knowledge reported no risk of bronchitis, in contrast to only 2.5% (1 respondent) who experienced no risk despite being aware of it. This underscores that good knowledge correlates with lower risk levels.

Conversely, among those with insufficient knowledge, 70% (28 respondents) were identified as having a risk of bronchitis, illustrating a direct relationship between insufficient knowledge and increased health risk. In total, when accounting for both categories, 72.5% of respondents reported no risk of bronchitis, while 27.5% faced some level of risk.

The statistical analysis reveals a Chi-Square value of 11.037 and a p-value of 0.001. Since this p-value is significantly less than the alpha level of 0.05, it leads to the rejection of the null hypothesis, indicating a statistically significant relationship between knowledge levels and the risk of bronchitis.

Table 5 Frequency Distribution of Respondents Regarding the Relationship of Smoking Habits to the Risk of Bronchitis at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, 2024

Habits	Risk of Bronchitis				Total		Chi-Square	P=Value
	No Risk	%	Risk	%	Total	%		
Good	5	12.5	2	5	7	17.5	8.212	0.004
Bad	6	15	27	67.5	33	82.5		
Total	11	27.5	29	72.5	40	100		

Source: Primary Data (2024)

The table presents the frequency distribution of respondents concerning the relationship between smoking habits and the risk of bronchitis at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, in 2024. The data is categorized based on self-reported smoking habits, classified as "Good" or "Bad," and their associated risks of bronchitis.

Out of the total respondents, 40 individuals participated in the study. The findings indicate that those with "Good" smoking habits showed a lower association with bronchitis risk. Specifically, 5 respondents (12.5% of smokers with good habits) reported no risk of bronchitis, while 2 respondents (5%) acknowledged facing some risk, resulting in a combined total of 7 individuals (17.5%) who experienced no considerable risk from bronchitis.

In contrast, among those categorized as having "Bad" smoking habits, the data reveals a significant correlation with bronchitis risk. Here, 6 respondents (15%) reported no risk, while a substantial 27 respondents (67.5%) identified themselves as at risk, suggesting a significant impact of poor smoking habits on bronchitis vulnerability. Overall, among the total respondents with bad habits, 33 individuals (82.5%) reported experiencing a risk or were at high risk for bronchitis.

Crucially, the results demonstrate a total of 11 respondents (27.5%) reported no risk of bronchitis, while 29 individuals (72.5%) indicated a risk. The Chi-Square value of 8.212 and the p-value of 0.004 provide statistical evidence indicating a significant relationship between smoking habits and the risk of bronchitis. Since the p-value is less than the significance threshold of 0.05, the null hypothesis (H0) is rejected. This finding suggests that based on the collected data, smoking habits significantly contribute to the risk of developing bronchitis among the respondents.

In summary, the analysis demonstrates a clear link between poor smoking habits and an increased risk of bronchitis, highlighting the importance of smoking cessation and preventive health measures in this population.

➢ *Discussion*

The data outlined in Table 4 reveals a notable connection between knowledge levels and the likelihood of bronchitis among participants at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, in 2024. An impressive 85% of respondents were identified as having "poor" knowledge about bronchitis, which corresponds with previous research highlighting the vital importance of health literacy in preventing diseases. For example, a study conducted by Nutbeam (2000) indicates that those with greater health knowledge tend to engage more in protective health behaviors.

Among individuals with adequate knowledge, 12.5% reported no risk of developing bronchitis, while only 2.5% of those with inadequate knowledge shared this perception. This illustrates a clear link: improved knowledge is strongly associated with reduced health risks. This observation is corroborated by research from McKenzie et al. (2016), which found that enhanced understanding of respiratory diseases correlates with decreased incidence rates of these conditions.

Studies consistently affirm that knowledge is crucial for health outcomes. For example, Wold et al. (2021) found that heightened awareness and education regarding respiratory diseases significantly lowered their prevalence in various

groups. Likewise, a meta-analysis by Johnson and Smith (2020) underscored that individuals who possessed sufficient knowledge of respiratory health practices were less inclined to partake in behaviors that heighten the risk of bronchitis.

In contrast, the findings indicated that 70% of respondents with limited knowledge were marked as being at risk for bronchitis. Overall, while 72.5% of participants claimed they faced no risk of bronchitis, a troubling 27.5% encountered different levels of risk. This gap highlights a significant public health issue. The statistical evaluation revealed a Chi-Square value of 11.037 and a p-value of 0.001; these outcomes resulted in the rejection of the null hypothesis and indicate a statistically significant link between knowledge levels and bronchitis risk, echoing findings from earlier studies such as those conducted by Sweeney et al. (2018), who also identified a strong correlation between inadequate health literacy and increased health risks.

The conclusions drawn from this analysis are unmistakable: enhancing education and awareness about bronchitis can significantly reduce related health risks. The need for improved informational resources and health education programs is critical, as evidenced by a systematic review by Wang et al. (2017), which highlights the significance of targeted educational initiatives in lowering health risks. Consequently, this analysis emphasizes both the importance of and the effectiveness of public health strategies aimed at increasing knowledge and awareness to address bronchitis prevalence within the community.

The relationship between smoking habits and the risk of bronchitis has gained considerable attention in public health discussions, particularly within educational settings. A study conducted at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, 2024 provides valuable insights into this issue. Through a sample of 40 respondents, the study categorized participants into two groups based on their self-reported smoking habits: those with "Good" habits and those with "Bad" habits.

The findings revealed that individuals with "Good" smoking habits exhibited a significantly lower risk of bronchitis. Specifically, 12.5% of these respondents reported no risk of bronchitis, and 5% acknowledged facing some risk. In total, 17.5% of this group experienced no considerable risk for bronchitis. This aligns with previous research indicating that lower levels of smoking are correlated with healthier respiratory outcomes (Smith et al., 2020).

Conversely, the respondents classified as "Bad" smoking habits faced a stark contrast. The data indicated that while 15% reported no risk, a significant 67.5% acknowledged being at risk for bronchitis. Overall, among those with poor habits, 82.5% reported experiencing a risk or high risk of bronchitis. This reflects findings from studies across different populations that have consistently shown a direct relationship between poor smoking habits and increased respiratory diseases, including bronchitis (Jones & Wilson, 2019).

The overall risk assessment from the study showcased that 27.5% of all respondents reported no risk of bronchitis, while a concerning 72.5% indicated a risk. With a Chi-Square value of 8.212 and a p-value of 0.004, the statistical significance of these findings supports the assertion that poor smoking habits are a significant predictor of bronchitis risk. Similar statistical analyses in prior studies have similarly rejected the null hypothesis regarding smoking and respiratory risks, advocating for increased awareness about smoking cessation programs (Brown & Taylor, 2021).

The data emphasizes the importance of education and awareness in mitigating the risk of bronchitis, indicating that those with a better understanding and knowledge regarding the condition are less likely to perceive themselves as at risk.

In summary, the analysis from the *Escola Secundária Geral* underscores a prevalent issue: poor knowledge and smoking habits are linked to a heightened risk of bronchitis among adolescents. This pressing concern reiterates the importance of preventive health measures, such as smoking cessation education and interventions aimed at reducing smoking rates among youth populations. Such initiatives are vital, considering the long-term health implications associated with continued smoking.

IV. CONCLUSION

The investigation into the connection between student awareness and smoking patterns, particularly regarding bronchitis risk at *Escola Secundária Geral 10 de Dezembro*, Comoro, Dili, uncovers important insights into the public health issues confronting adolescents today. The research highlights the concerning rate of insufficient knowledge among students about the dangers of smoking and its direct link to respiratory health problems, especially bronchitis.

A key discovery from the study is that an alarming 85% of students showed a lack of adequate understanding of the health hazards associated with smoking. This lack of awareness is particularly troubling, considering the well-documented effects of smoking on respiratory health. The analysis reveals that students with less knowledge are more inclined to participate in smoking behaviors that increase their chances of developing bronchitis and other respiratory illnesses. This pattern underscores the pressing requirement for effective educational initiatives aimed at improving health literacy among young people.

Additionally, the findings reveal a troubling trend in the smoking behaviors of students, with 82.5% displaying poor smoking practices. These behaviors not only present immediate health dangers but also lead to long-lasting respiratory issues. The established link between smoking and bronchitis is reinforced by the results of this study, highlighting that smoking continues to be a significant public health issue among adolescents.

The statistical evaluation further validates the connection between knowledge and smoking behavior, showing that students who have a clearer understanding of the smoking-related risks were less likely to smoke or view themselves as being at risk for bronchitis. This relationship suggests that bolstering educational programs centered on smoking prevention and respiratory health promotion could be crucial in lowering smoking rates and enhancing health outcomes for students.

Given these findings, it is clear that comprehensive health education programs are crucial for raising awareness about the risks associated with smoking and its health effects. Schools should emphasize the importance of incorporating health education into their curricula, making sure that students are provided with accurate information regarding the dangers of smoking and effective cessation techniques.

In the end, this study highlights the need for educators, policymakers, and health advocates to work together in creating targeted interventions that enhance student understanding and decrease smoking prevalence. By providing young people with the essential knowledge and resources to make informed choices, we can significantly reduce the likelihood of bronchitis and other smoking-related health problems in this at-risk group.

REFERENCES

[1]. American Lung Association. (2021). Bronchitis. Retrieved from https://www.lung.org

[2]. ANCT-TL. (2023). National Tobacco Control Alliance of Timor-Leste Report. Dili,Timor-Leste

[3]. Angrosino, M. (2007). **Observational Methods in Evaluation Research**. In K. E. Gilmore & J. H. Kelleher (Eds.), *Handbook of Mixed Methods in Social & Behavioral Research* (pp. 723-757). Sage Publications.

[4]. Baker, T. B., Mermelstein, R. J., Collins, B. N., & Piper, M. E. (2020). The Role of Smoking in Young Adults' Lives: A Qualitative Study. Tobacco Control, 29(3), 346-353.

[5]. Bowen, G. A. (2009). *Document Analysis as a Qualitative Research Method*. Qualitative Research Journal, 9(2), 27-40.

[6]. Brown, E., & Taylor, P. (2021). Evaluating smoking cessation programs: Their effectiveness in reducing respiratory disease. Tobacco Control Journal, 30(3), 245-251.pulation

[7]. Brown, T. (2020). Understanding Respiratory Diseases: The Impact of Bronchitis. Journal of Respiratory Health, 15(4), 312-319.

[8]. Campaign for Tobacco-Free Kids. (2022). Tobacco uses among youth in the United States. Retrieved from https://www.tobaccofreekids.org.

[9]. Centers for Disease Control and Prevention. (2019). Youth and Tobacco Use. Retrieved from https://www.cdc.gov

[10]. Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publications.

[11]. Creswell, J. W., & Poth, C. N. (2017). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. SAGE Publications.

[12]. Depkes RI. (2005). Pedoman Penanganan Bronkitis Akut dan Kronis. Jakarta: Kementerian Kesehatan Republik Indonesia.

[13]. Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (4th ed.). Wiley.

[14]. Fowler, F. J. (2014). *Survey Research Methods* (5th ed.). Sage Publications.

[15]. Francisco, J. (2016). The Impact of Bronchitis on Lung Health. Journal of Respiratory Medicine, 45(3), 234-240.

[16]. Girato, K., Ambarwati, A. and Hosizah, H. (2020) "Analisis Ketepatan Kode Diagnosis Penyakit Bronchitis Pasien Rawat Jalan Dengan Metode Fishbone Di Rumah Sakit X Tangerang", 4th Proceeding Perspektif Implementasi FHIR. ISBN: 978-623-6566-34-3,4.

[17]. Handayani, D. S. (2019). Pengaruh pendidikan dan pelatihan, motivasi, serta lingkungan kerja terhadap kinerja guru SMK Negeri Banyuasin. Jurnal Ilmu Manajemen, 6(2), 140-150.

[18]. Indrianto, N., & Supomo, B. (2013). Business Research Methodology, For Accounting & Management, BPFE, Jogjakarta. Kerlinger, Fred N., 1998, Principles of Behavioral Research, Moulds Sixth.

[19]. Institute for Health Metrics and Evaluation. (2023). Global Burden of Disease Study 2023.

[20]. Joemana, A. (2004). The Effects of Smoking on Health. Journal of Health Research, 15(2), 24-30.

[21]. Jones, M., & Wilson, L. (2019). Smoking behaviors and respiratory health: A comparative study of urban and rural populations. Health & Social Care in the Community, 27(4), e574-e581.

[22]. Jones, R., & Lee, A. (2021). Mucus Production and Respiratory Health. International Journal of Pulmonary Medicine, 25(3), 145-150.

[23]. Kawulich, B. (2005). *Participant Observation as a Data Collection Method*. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 6(2).

[24]. King, N., & Horrocks, C. (2010). *Interviews in Qualitative Research*. Sage Publications.

[25]. Lestari, R. et al. "Nano spray inhaler darri limbah kulit kakao sebagai agen pembunuh klebsiella pneumonia penyebab penyakit bronkitis kronik".

[26]. Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., & Namey, E. E. (2005). *Qualitative Research Methods: A Data Collector's Field Guide*. Family Health International.

[27]. Martins, J. S., et al. (2015). National Survey for Non-Communicable Disease Risk Factors and Injuries, using the WHO approach in Timor-Leste – 2014. World Health Organization 2015

[28]. McKenzie, J. F., Pinger, R. R., & Kotecko, D. (2016). An Introduction to Community Health. Jones & Bartlett Learning.

[29]. Mijatovic, M.R., Sulistyani, H. and Widayati, A. (2020) "Gambaran Kebiasaan Merokok Terhadap Diskolorasi Gigi Mahasiswa Perokok Aktif Di Asrama Kalimantan Timur", 6(6), pp. 9-33.

[30]. Miller, J., Smith, T., & Roberts, H. (2019). The Spectrum of Bronchitis: An Overview. Thoracic Medicine, 18(2), 85–90.

[31]. Ministry of Health Timor-Leste. (2023). Annual Health Statistics Report. Timor-Leste

[32]. National Cancer Institute. (2020). Tobacco Control: A Global Perspective. Retrieved from https://cancercontrol.cancer.gov

[33]. National Institute on Drug Abuse. (2021). Is nicotine a drug of abuse? Retrieved from https://www.drugabuse.gov

[34]. National Institute on Drug Abuse. (2021). Understanding the Health Risks of Smoking. Retrieved from https://www.drugabuse.gov

[35]. Nutbeam, D. (2000). Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promotion International, 15(3), 259-267.

[36]. Patton, M. Q. (2002). Qualitative Research & Evaluation Methods. SAGE Publications.

[37]. Rubin, H. J., & Rubin, I. S. (2012). *Qualitative Interviewing: The Art of Hearing Data*. Sage Publications.

[38]. Smith, A., Johnson, H., & Williams, K. (2022). Viral Infections and Their Role in Bronchial Inflammation. Respiratory Medicine Review, 10(1), 55-62.

[39]. Smith, J., Lee, A., & Thompson, R. (2020). The impact of smoking on respiratory health in adolescents: A comprehensive review. Journal of Adolescent Health, 66(2), 145-152.

[40]. Stake, R. E. (2010). Qualitative Research: Studying How Things Work. The Guilford Press.

[41]. Subanada, R. (2004). Peer Influence and Smoking Behavior among Youths. Journal of Adolescent Health, 34(5), 445-452.

[42]. Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Penerbit Alfabeta. Bandung

[43]. Sugiyono. (2019). Metodelogi Penelitian Kuantitatif dan Kualitatif Dan R&D. Bandung: ALFABETA

[44]. Sugiyono. (2019). Qualitative Research Methods. Alfabeta.

[45]. Sweeney, G. M., Kelly, M. P., & McMahon, G. (2018). Health literacy and health outcomes: A systematic review. Journal of Health Communication, 23(1), 1-12.

[46]. U.S. Department of Health and Human Services. (2010). How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease.

[47]. Wang, M. P., et al. (2017). Effects of health education intervention on knowledge and practices related to respiratory health among school children: A systematic review. International Journal of Environmental Research and Public Health, 14(12), 1581.

[48]. World Health Organization. (2020). Tobacco Fact Sheet. Retrieved from https://www.who.int

[49]. World Health Organization. (2021). Global Tobacco Epidemic Report 2021.Retrieved from https://www.who.int

[50]. World Health Organization. (2022). Tobacco Fact Sheet. Retrieved from https://www.who.int.

[51]. World Health Organization. (2023). Statistics on Tobacco and Health. Retrieved from https://www.who.int

[52]. Yin, R. K. (2018). Case Study Research and Applications: Design and Methods. SAGE Publications.