FACTORS RELATED SMOKING BEHAVIOR AMONG STUDENTS AT HAINAN VOCATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY IN YUNLONG CAMPUS

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摘要

题目：海南科技职业大学云龙校区学生吸烟行为的相关因素

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本研究是一项描述性横截面分析设计研究，旨在（1）考察海南科技职业大学云龙校区学生的吸烟行为；（2）调查与学生吸烟行为相关的因素。样本由 411 名学生组成。研究工具为结构式问卷，由个人信息、吸烟知识、吸烟态度和吸烟行为四部分组成。数据分析采用描述性统计（频率、百分比、平均值和标准差）和推断性统计（卡方检验）以找出影响吸烟行为的因素。

调查结果显示，44.28%的学生表示目前正在吸烟，91.73%的学生对吸烟的认知水平较低，59.37%的学生对吸烟持积极态度。此外，研究还发现吸烟行为与家庭和同伴影响、吸烟信息接触、吸烟知识水平和吸烟态度有显著的统计学关联（$P < 0.05$）。

这些结果可作为制定学校健康促进计划和实施家庭与教育机构合作干预的指南，以有效降低吸烟率，促进学生养成可持续的健康行为。

关键词：吸烟行为,吸烟态度,吸烟知识,大学生

ABSTRACT

Title: Factors Related Smoking Behavior Among Students at Hainan Vocational University of Science and technology in Yunlong Campus

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This study was a descriptive analytical cross-sectional study aimed to (1) examine the smoking behavior of students at Hainan Vocational University of Science and Technology, Yunlong Campus, and (2) investigate the factors related to their smoking behavior. The sample consisted of 411 students. The research instrument was a structured questionnaire composed of four parts: personal information, knowledge about smoking, attitudes toward smoking, and smoking behavior. Data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation), and inferential statistics (Chi-square test) to identify factors related to smoking behavior.

The findings revealed that 44.28% of the students reported currently smoking, 91.73% had a low level of knowledge about smoking, and 59.37% had a positive attitude toward smoking. Additionally, smoking behavior was found to have a statistically significant association with family and peer-related exposure to

information about smoking, level of knowledge, and attitude toward smoking ($p < 0.05$).

These results can serve as a guideline for developing school-based health promotion programs and implementing collaborative interventions between families and educational institutions to effectively reduce smoking rates and promote sustainable health behaviors among students.

Keywords: Smoking behavior /smoking attitudes/smoking knowledge/college students

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CHAPTER I

INTRODUCTION

Background and Rationale

Tobacco harm has become one of the most serious public health problems in the world today and one of the major challenges facing human health. In 2005, the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) came into force. Countries have strictly implemented tobacco control measures, and the global tobacco epidemic has achieved remarkable results. However, only 32 countries are expected to meet the global goal of "reducing tobacco use by 30% by 2050" (World Health Organization, 2019). It is estimated that there are 1.1 billion smokers aged 15 years and older in the world today, with prevalence rates of 32.7% and 6.6% for men and women, respectively. Tobacco use kills more than 8 million people globally each year, while healthcare expenditures due to smoking amount to more than $400 billion, or 5.7% of total global healthcare expenditures (World Health Organization, 2021). The tobacco epidemic has resulted in serious economic and health losses and poses a huge public health challenge worldwide.

China, as a major tobacco-consuming country, has one-third of the world's smoking population. Data from the China Smoking Hazardous Health Report 2020 show that more than 1 million people die from tobacco-related hazards in China each year. If effective measures are not taken, it is expected that the number of people who die from tobacco-related hazards each year will increase to 2 million by 2030 and to 3 million by 2050 (Wang, Xiao, & Chi, 2021).

In recent years, due to 8;the related of family situation, academic pressure, social environment, and other related factors, college students, as an impressionable group, are more likely to be relatedd by academic pressure, parents, peers, and other factors. More and more college students are driven by curiosity to start smoking. The use of tobacco brings great Smoking harm. Tobacco is addictive, so once college students are exposed to tobacco, they will easily become dependent on it and become

Currently smoking individuals. Most people are exposed to tobacco during their teenage years, and studies show that the average age of initial smoking for smokers in China is 20 years old. The Chinese population has a low prevalence of smoking before the age of 15, and the prevalence of smoking in the 15–24 age group is rising rapidly, at about 17.9%, with college students being at that stage. The earlier the exposure to tobacco begins, the easier it is to become a smoker, and thus the more difficult it is to quit smoking, and the more smoking there will be in adulthood, thus making tobacco more harmful (Chen, Zhang, Xu, et al., 2022). Through surveys and studies, it has been found that there are currently about 130 million adolescents in China, of which about 15 million are Currently smoking, more than 40 million people have Tried smoking, but currently do not smoke, and as many as 540 million people have been exposed to the hazards of secondhand smoke (Deng, 2023). At present, China's first-time smokers, in terms of age characteristics of the population, show a trend of being younger. The number of students trying to smoke and the number of students who are Currently smoking are increasing year by year. Smoking is seriously jeopardizing the physical and mental health of college students. In recent years, the number of college students who are Currently smoking is increasing year by year, and

college students' Smoking Behavior has become a globally recognized problem (Yao, Li, Li, et al., 2023).

Epidemiologic surveys show that smoking is one of the most important causative factors for lung cancer and one of the risk factors for many diseases. According to relevant survey data, the smoking rate of college students is increasing year by year, and Smoking Behavior has a significant impact on the physical and mental health of college students. On the one hand, tobacco smoke contains more than 69 known carcinogens. Long-term smoking will greatly increase the risk of lung cancer, heart disease, stroke, and other serious diseases. On the other hand, college students' Smoking Behavior also has a long-term impact on their academic, social, and future health (Chen, 2023). Studies have shown that smoking impairs brain function, leading to distraction and memory loss, thus affecting academic performance. At the same time, Smoking Behavior may also affect the social image of college students and limit their career development. More seriously, once a smoking habit is formed, it is often difficult to quit, and it will stay with them for the rest of their lives, posing a continuous threat to their future health and quality of life (Hu, 2022).

Studies have shown that early exposure to smoking is more likely to lead to future alcohol and drug use, and that most students would quit smoking if they could be prevented from doing so before they graduate from college (Brown & Clark, 2020). Because college students do not have a comprehensive understanding of smoking behavior, prevention of smoking behavior should begin early. As their attitudes and behaviors toward health are highly malleable, early smoking intervention and education for college students should achieve twice the result with half the effort.

Rationale

Tobacco poses serious risks globally and in China

Smoking harm has become a major global public health issue. Although the world has achieved certain results in tobacco control, most countries are far from reaching their tobacco control goals. China is a major tobacco consumer with a large number of Currently smoking individuals. Every year, the number of deaths due to Smoking harm is high and continues to rise. Smoking harm causes significant economic and health losses.

The smoking problem among college students is highlighted

At present, the smoking problem among college students in my country is serious, and the number of Currently smoking college students is increasing year by year, which seriously harms the physical and mental health of college students. In this context, studying the related factors of Smoking Behavior among students in Hainan Vocational University of Science and Technology in Yunlong Campus is helpful to understand the specific reasons for the Smoking Behavior of this group and provide a basis for targeted tobacco control work, which has important practical significance.

The regional research gap needs to be filled.

Currently, most domestic studies on college students' smoking behavior focus on general undergraduate colleges in the eastern region, and there is no empirical analysis of vocational colleges situated on islands. The Yunlong Campus of Hainan Vocational University of Science and Technology is located in an urban-rural fringe area. The student body comprises individuals from both urban and rural family backgrounds, so their smoking behavior may be influenced by the combined effects of multiple factors. By analyzing the factors related to smoking behavior, this study aims

to uncover the unique triggers of smoking behavior among students at Hainan Vocational University of Science and Technology's Yunlong Campus and provide a scientific basis for the formulation of differentiated tobacco control strategies in similar vocational colleges and universities. This, in turn, will assist in promoting a healthy ecological environment within the field of vocational education.

Objective

1. To study the smoking behavior of students at Hainan Vocational University of Science and Technology in Yunlong Campus.

2. To study the factors related with the smoking behavior of students at Hainan Vocational university of science and Technology in Yunlong Campus.

Research question

1. What is the smoking behavior of students at Hainan Vocational University of Science and Technology in Yunlong Campus？

2. Is the smoking behavior of students an Hainan Vocational university of Science and Technology in Yunlong Campus related to personal and Knowledge, Attitdesl factors?

Hypothesis

1. The students in the Hainan Vocational university of science and Technology in Yunlong Campus exhibit a high level of Smoking Behavior.

2. Personal and Knowledge, Attitdes factors of smoking behavior of students an Hainan Vocational university of Science and Technology in Yunlong Campus.

Operational definition

Fluencing factors

These factors are the various factors or conditions that have an impact on students' smoking behavior. These factors can be individual, knowledge, and attitudinal.

Students

Currently enrolled freshmen through seniors at the Hainan Vocational University of science and Technology in Yunlong Campus. in Haikou Hainan Province.

Smoking Behavior

Based on the definitions of smoking behaviors provided by the World Health Organization's "Basic Principles for Surveying Smoking Behavior", we can define the following categories clearly:

1. Never - smokers: have never smoked, even one or two cigarettes.

2. Tried smoking,but currently do not smoke: have attempted to smoke once but have not smoked since then.

3. Currently smoking: including the following situations:

3. 1 Irregular smokers: have smoked but have not smoked at least 1 cigarette per week for at least 3 consecutive or cumulative months;

3. 2 Weekly smokers: smoked at least 1 cigarette per week, and smoked continuously or cumulatively for 3 months or more;

3. 3 Daily smokers: smoked at least 1 cigarette per day, and smoked continuously or cumulatively for 3 months or more;

3.4 Regular smokers: included weekly smokers and daily smokers.

Smoking harm

Smoking harm refers to the harm to the body arising from the act of smoking or exposure to secondhand smoke, which not only directly damages the smoker's respiratory system and increases the risk of serious diseases such as lung cancer, chronic obstructive pulmonary disease and emphysema, but also poses a threat to the health of the surrounding population, especially children, pregnant women and the elderly, through secondhand smoke. Long-term smoking can lead to damage to the cardiovascular system, causing heart disease, high blood pressure and stroke. In addition, smoking is strongly relatedd with a number of cancers such as oral, laryngeal, esophageal, stomach, kidney and bladder cancers. Smoking also affects the body's immune system, making smokers more susceptible to diseases.

Attitudes towards smoking

Smoking attitudes refer to the sum of opinions, emotional dispositions and corresponding behavioral responses held by individuals or societies towards smoking behavior. Such attitudes include both the psychological state of recognizing, accepting or rejecting the harms of smoking at the individual level and the legal norms, moral

evaluations and public health policy formulation and implementation of smoking behavior at the societal level.

Willingness to quit

A psychological and sociological concept that refers to the desire or determination of an individual or group of individuals to actively want to stop smoking and to make an effort to do so after recognizing the possible negative effects of smoking on health, quality of life or the social environment.

Expected Benefits and applications

The study will help to reduce the smoking rate of students, safeguard their health, and promote the harmonious and stable development of the college. The results of the study can provide a scientific basis for the tobacco control work of the college and a theoretical basis for the formulation of relevant tobacco control policies and health education in the college

CHAPTER II

LITERATURE REVIEW

This chapter presents the relevant concepts, theories, and conceptual framework that serve as the foundation for conducting this research. It provides an overview of the theoretical framework that structures the study and includes a review of related literature to support and clarify the research, as detailed below.

1. Current situation of smoking among university students

    1.1 Overview of smoking among university students globally, including in China

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6. Previous Research on Smoking among Students
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    6.2 Shortcomings and limitations of previous research related to this topic
7. Conceptual Framework

According to the World Health Organization (2019), there are currently about 1.3 billion smokers (part of Smoking Behavior can be inferred here as it relates to the group being discussed), and 5 million deaths are caused by smoking harm each year, of which about 50% occur in developing countries. China is currently the world's number one producer and consumer of tobacco, and the number of smokers (again, part of Smoking Behavior) in China has shown a period of rapid growth, with smoking prevalence increasing at a rate of about 2% per year. Currently, the number of smokers in the country has reached 350 million, and about 1 million people die from smoking-related diseases every year. Smoking harm is not only detrimental to the smoker but also to the large number of people living around them who are exposed to “second-hand smoke”. Passive smoking increases the risk of lung cancer and heart disease in never-smokers (Liang, 2022). and according to relevant studies, the prevalence of adolescents who have tried smoking and are now smoking is increasing year by year, and the age of smoking initiation is showing a tendency to be lower (Chen & Huang, 2023). Because of the health hazards caused by tobacco, smoking has been listed by the WHO as one of the top ten serious threats to human health in the 21st century.

Current situation of smoking among university students

Overview of smoking among university students globally, including in China

Currently, smoking has become one of the major public health problems in China, if not the world, and poses a great threat to human health. Smoking harm is not only a major cause of lung cancer but also significantly increases the risk of many diseases, including chronic respiratory diseases, coronary heart disease, and stroke, which in turn leads to high morbidity and mortality from these diseases. Therefore, smoking is regarded as an important risk factor for the occurrence and mortality of these diseases and needs to be emphasized globally. According to a number of domestic studies, the smoking prevalence (part of Smoking Behavior) among college students shows some volatility but is generally on the rise (Chen, 2021; Ma et al., 2023; Qi et al., 2019). Specifically, there are differences in smoking prevalence among college students in different years, regions, and school types. Some studies have found that medical students differ from other majors in their smoking behavior, and medical students have relatively lower smoking rates than other majors (Wang et al., 2021). The National College Student Tobacco Epidemic Survey conducted by the China Center for Disease Control and Prevention (CDC) in 2021 showed that the smoking rate (a measure of Currently smoking) among college students in China is now 7.8%, with the rate of currently smoking among male students much higher than that of female students (Kaiser, 2021). Kaiser (2021) also found that there is a significant relationship between the grade and gender of college students in terms of smoking behavior. This data suggests that the problem of college student smoking behavior (including currently smoking) cannot be ignored and requires widespread attention. In recent years, the

problem of smoking behavior among college students has received widespread attention from all sectors of society. Relevant data show that most of the students start smoking behavior (i.e., become currently smoking) in college, and the number of currently smoking students increases with the grade (Zhang, 2019).

In a study conducted by Chinese scholars Li et al. (2017), the results of a survey of 91 college students on their smoking behavior revealed a striking trend: 44 of them explicitly stated that they were never-smokers and maintained a smoke-free life, while the remaining 47 admitted frankly that they had tried smoking, but currently do not smoke or had had the experience of currently smoking, which to a certain extent reflects the wide distribution of the habit and its potential impact in the population.

In foreign studies, especially in surveys on the smoking behavior of college students, it was found that the smoking prevalence (reflecting the proportion of currently smoking individuals) of male students aged 18-24 was significantly higher than that of female students (Nasser, Geng, & Al-Wesabi, 2020). This suggests that there are differences between male and female students in terms of their physical, psychological, and social environments, and that these differences may influence their smoking behavior. For example, boys may be more inclined to be thrill-seekers and risk-takers, and smoking behavior is sometimes seen as a way of expressing these traits.

Hazards of Smoking

According to a 2019 report released by the World Health Organization (WHO) (World Health Organization, 2019), about 1.337 billion people aged 15 and older worldwide are currently smoking (or engaging in smoking behavior). According to the

WHO's Global Tobacco Epidemic Surveillance Report, the global smoking prevalence among people aged 15 and older showed a downward trend from 22.5% to 19.2% in the decade from 2007 to 2017 (World Health Organization, 2019). Tobacco has a huge impact on global public health, leading to more than 8 million deaths each year. Of these deaths, approximately 7 million are directly attributable to smoking-induced illnesses, while approximately 1.2 million deaths are attributable to illnesses caused by exposure to secondhand smoke, which clearly demonstrates that passive inhalation of secondhand smoke, whether in the home or the workplace, also increases the risk of developing lung cancer.As the world's largest producer, consumer, and victim of tobacco, China accounts for about 40% of the world's cigarette production and sales (Jin et al., 2022). At present, lung cancer has become the number one "killer" in China, ranking first in terms of mortality rate and accounting for more than 2/3 of the global lung cancer deaths. Currently, in addition to traditional cigarettes, e-cigarettes have emerged as a new type of tobacco substitute in the domestic tobacco market. However, whether it is traditional cigarettes or e-cigarettes, for teenagers, who are at a critical stage of physical development and psychological growth, the smoking harm is far greater than that of adults. This is because adolescents are more susceptible to the negative effects of tobacco products because their body organs and systems are not yet fully developed. Worse yet, the earlier youth are exposed to tobacco products, the more serious the damage to their health and the more likely they are to become currently smoking individuals in the long term.

Harmful effects of traditional cigarettes on young people

In domestic studies, it has been found that cigarette smoke is produced when cigarettes are burned, and the smoke in the smoke contains hundreds of harmful substances and at least 70 carcinogens (Chen Jing, 2023) .The chemical composition of tobacco and its smoke is extremely complex, currently known to be up to 7,000 types, including a large number of harmful substances to the human body. These harmful components are not only diverse, but also extremely hazardous, including some that are clearly recognized as Class I carcinogens. When we explore these harmful components in cigarette smoke, we can find that they include nicotine (also known as nicotine), cigarette tar, colorless and odorless but highly toxic carbon monoxide, as well as a series of amines, phenols and other compounds with strong irritation. More worryingly, these fumes also contain radioactive substances and heavy metals such as arsenic and mercury, whose potential threat to human health cannot be ignored.

The stimulating effect of these harmful ingredients on the body is extremely strong, and they not only affect the health of adults, but also jeopardize the health of adolescents more seriously. Adolescents are in a critical period of growth and development; their body organs are not yet fully developed and their resistance to harmful substances is weak. Therefore, exposure to these harmful substances may have far-reaching effects on adolescents' physical development, immune system and future health.

In the research of our scholar Zhang Ping (2017), it is believed that smoking is more harmful to the human body, especially to teenagers who are in the developmental stage, and it is found that the younger their smoking age, the higher the chance of lung cancer.The nicotine in cigarette smoke briefly stimulates the human

body, causing a feeling of euphoria, as if giving the body a short period of vitality. However, after this euphoria, it produces a significant depressant effect on the nervous system of the brain, causing people to feel fatigue and discomfort. Not only that, nicotine also triggers a series of physical reactions, such as chest tightness, nausea, dizziness, etc. These symptoms are common adverse reactions after smoking. More seriously, long-term smoking will gradually weaken the sensitivity and accuracy of the neuromuscular, making its reaction become sluggish, especially for college students who are in their teenage years, which will affect the efficiency and performance of their studies.

Smoking has a close relationship with the occurrence of many kinds of cancer. A large number of foreign studies have shown that the chances of smokers developing lung cancer are much higher than those of non-smokers, with an increase of about 20 times. In addition, smoking is also related to the occurrence of oral cancer, pharyngeal cancer, nasopharyngeal cancer, stomach cancer, esophageal cancer, and malignant tumors of the urinary system, kidney cancer, and even malignant tumors of the blood system (Zhao et al., 2022). Compared with non-smokers, the incidence of these tumors is about two to five times higher. In addition, smoking affects the quality of life of college students and has a very significant impact on the quality of sleep, causing smokers to feel irritable and have less deep sleep (Klebe, Leigh, Henderson, & Nurminen, 2020).In addition, smoking may lead to osteoporosis, which affects the health of college students.

Harmful effects of e-cigarettes on young people

In recent years, e-cigarettes have rapidly gained popularity around the world, and have become especially popular with college students. However, the World Health Organization has issued a clear statement that e-cigarettes are recognized as a product that is harmful to health and there is currently a lack of conclusive evidence to support the claim that they help with smoking cessation (Shi, 2024). In fact, people who use e-cigarettes are more likely to end up as actual smokers, or even become dependent on both e-cigarettes and traditional tobacco.

Domestically, extensive research has also been conducted on the dangers of e-cigarettes to college students. First, domestic studies have similarly pointed out that nicotine and other chemical components in e-cigarettes pose a potential threat to the health of college students(Shi, 2024) . Liu (2023) emphasized in his study that e-cigarettes are not harmless substitutes. The aerosols they produce contain a variety of harmful substances, including ultrafine particles, volatile organic compounds and heavy metals. The long-term effects of these components on the respiratory and cardiovascular systems cannot be ignored.The intake of nicotine will affect the health of the nervous system and cardiovascular system of college students, while other chemical components may cause damage to the respiratory system and immune system,because in addition to nicotine, the main component of e-cigarette's liquid, it also contains a series of carbonyl compounds, such as formaldehyde, acetaldehyde, and other carbonyl compounds, as well as the unique tobacco nitrosamines (Zhang, 2023). These substances have been clearly identified by the International Agency for Research on Cancer as carcinogens, they not only have a very high risk of cancer, but also pose a serious threat to respiratory health, they can inhibit the normal movement of

respiratory epithelial cell cilia, and thus produce substantial damage to the respiratory tract. Studies have found that adolescents who start using e-cigarettes too early can have significant negative effects on their brain development (Chen et al., 2023).This exposure can lead to psychological disorders such as learning difficulties and anxiety, as well as a significant increase in the risk of COPD, lung cancer, cardiovascular disease and other smoking-related health risks. Therefore, youth should avoid exposure to e-cigarettes and other tobacco products.

In a study by Peng Lifang et al. (2021), which used a questionnaire survey on adolescents, it was found that adolescents who had been addicted to e-cigarettes for a long period of time were more likely to suffer from a series of oral health problems, such as dry mouth, bad taste, bleeding gums, degradation of the sense of taste, and discomfort of the oral mucosa, as compared to their peers who were non-smokers.This phenomenon clearly reveals the potential harmful effects of e-cigarette smoking on oral health, especially during the critical developmental stage of adolescents. Domestic studies have also focused on the impact of e-cigarettes on the mental health of college students (Gong & Gong, 2024). Some college students have psychological problems such as anxiety and depression due to long-term use of e-cigarettes. These psychological problems not only affect college students' studies and daily life, but also may lead to more serious social problems.

In foreign studies, it is believed that the nicotine content in e-cigarettes poses a potential threat to the nervous system and cardiovascular system of college students (Gades et al., 2022). Nicotine is a strong neurotoxin, and long-term intake will cause college students to suffer from poor concentration, memory loss, mood swings and other problems. At the same time, nicotine stimulates the heart and increases its burden,

leading to an increased risk of cardiovascular diseases such as arrhythmia and hypertension. Secondly, other chemical components in e-cigarettes also pose a threat to the health of college students. For example, ingredients such as propylene glycol and glycerol in e-cigarettes will release harmful substances such as formaldehyde and acetaldehyde when heated, and these substances will damage the respiratory and immune systems of college students. In addition, some e-cigarette products have added flavorings, colorings and other additives, the safety of which has not been fully verified and may also pose potential health hazards to college students.

Influences on the occurrence of smoking behavior among college students

Gender Factors

Related studies in China have also found that students' smoking behavior is not related to gender. Qin, S. L., Luo, Y., Luo, X., et al. (2021) found that there was no significant difference in smoking behavior between male and female vocational high school students in Hubei Province, suggesting that gender does not have a significant effect on smoking behavior in this population. This finding challenges the traditional stereotype that smoking is predominantly a male behavior and underscores the importance of considering region-specific, population-specific, and perhaps even era-specific factors when analyzing smoking trends. Furthermore, this result implies that public health interventions aimed at reducing smoking rates among students should be designed to be inclusive and equally effective for both genders, rather than being tailored based on outdated gender-based assumptions about smoking prevalence.

This finding effectively echoes the multidimensional research framework in the existing literature, which emphasizes the complexity and interplay of various factors related smoking behavior. Such findings suggest that the explanatory power of gender as a single variable is weakening in the study of smoking behavior, a shift that is significantly relatedd with the evolution of the concept of gender equality globally (Wu, 2023). As societies increasingly embrace gender equality, traditional gender norms and roles are being redefined, leading to a more nuanced understanding of behaviors that were once predominantly attributed to one gender or the other. In the context of smoking, this means that factors such as personal choice, social influence, psychological stress, and accessibility to tobacco products are gaining prominence over gender in shaping individuals' smoking behaviors. Consequently, researchers and policymakers must adopt a more holistic approach that considers a wide range of variables to effectively address and reduce smoking rates across different populations.

Age Factor

Related studies have also found that the smoking rate is nonlinearly related to age. This research trend shows that the relationship between age and smoking behavior is driven by multiple factors such as health cognition, policy influence, and physiological dependence（Lin Zhu et al., 2019）. Specifically, during adolescence and early adulthood, individuals often undergo significant physical, psychological, and social changes, which can influence their perceptions of risk, attitudes towards health, and susceptibility to peer pressure. Health cognition, in particular, plays a crucial role as young people may underestimate the long-term health consequences of smoking or overestimate their ability to quit in the future. Additionally, policy influences, such as restrictions on tobacco sales to minors, increases in tobacco taxes, and the

implementation of smoke-free laws, can have a differential impact on smoking rates across age groups, with younger individuals often being more responsive to these measures.

Moreover, physiological dependence on nicotine, a highly addictive substance found in tobacco, develops over time and can vary significantly with age. Younger smokers, who may have started smoking more recently, might experience different levels of dependence compared to older, more established smokers. This physiological aspect, combined with the psychosocial factors mentioned earlier, creates a complex interplay that contributes to the nonlinear relationship between age and smoking behavior.

Family factors

The family is the "first classroom" of life and plays an important role in the development of youth behavior. Domestic studies have concluded that college students whose parents smoke are more likely to become smokers (Zeng, 2018). This finding aligns with Jiang and Tian's (2022) analysis of national data, which identified that living with smoking family members significantly increases the likelihood of smoking initiation among adults. College students' smoking behavior often stems from imitation and social recognition of family members or peers (Jiang et al., 2015)This influence is mainly realized through two ways: first, the parents' smoking behavior provides an object for the children to imitate, which makes it easier for the children to accept the smoking behavior; second, the parents' smoking behavior may lead to the family environment full of tobacco smoke, so that the children are in the state of passive smoking for a long time, which will increase the possibility of their smoking. In addition, some parents may believe that smoking is a social behavior and therefore may

encourage their children to smoke in order to fit into the social circle. However, this perception is wrong because smoking is not only hazardous to one's health, but also has a negative impact on the family and the community.

Foreign related studies, on the other hand, concluded that family support and communication also have an important influence on college students' smoking behavior (Alasqah et al., 2019). The emotional support, understanding and concern of family members can help college students establish a healthy lifestyle and reduce their likelihood of smoking. It can be seen that positive family communication can help college students understand the harms of smoking and thus enhance their willingness to quit smoking.

School factors

Among the many factors affecting college students' smoking, school factors occupy an important position. The following is an overview of the school factors of college students' smoking from the aspects of school regulations, campus environment and peer influence.

1. Impact of school regulations

As institutions of higher education, the rules and regulations of universities play an important role in guiding the behavior of college students. However, at present, some colleges and universities have the problems of unclear rules and regulations and insufficient enforcement in dealing with the issue of student smoking, which to a certain extent contributes to the trend of college students' smoking. Domestic studies have found that some colleges and universities do not explicitly prohibit students from smoking in their rules and regulations, or the provisions prohibiting smoking are too general and lack specific enforcement measures, which leads to the fact that there is no

clear institutional constraints on students when they smoke on campus, thus increasing the likelihood of smoking (Yin et al., 2023).

In addition, some colleges and universities have insufficient enforcement of rules and regulations against smoking (Kim, 2016). Although some colleges and universities have formulated regulations to prohibit smoking, there are many loopholes in the actual implementation, such as lack of supervision and strict penalties. This makes it less costly for students to smoke, further increasing the likelihood of smoking.

2. Impact of the campus environment

Campus environment is an important place for students to study and live, and its environmental atmosphere has an important influence on the behavior of college students, however, at present, some colleges and universities in the creation of the environmental atmosphere, there are many problems, which also to a certain extent contributes to the trend of smoking among students. When there is a lack of publicity and education on the hazards of smoking in the campus culture, it is often difficult for college students to form a correct concept of smoking (Cai et al., 2021). Therefore, if the campus culture actively advocates a healthy lifestyle and emphasizes the hazards of smoking, the willingness of college students to smoke will be greatly reduced. Therefore, it is important to build a healthy campus culture to reduce college students' smoking behavior.

In foreign studies, it is found that some colleges and universities lack publicity and education on the harms of smoking in campus culture construction, which leads to students' insufficient knowledge of the harms of smoking and easy to form the habit of smoking (Hossain et al., 2019). On the other hand, some colleges and universities have "cultural symbols" of smoking on campus, such as smoking areas, images of smokers,

etc. These symbols may convey the value that smoking is fashionable and a sign of maturity, thus attracting more students to join the ranks of smoking.

3. The role of peer influence

Peer influence plays a pivotal role in college students' smoking behavior. During college years, individuals are at a critical stage of psychological development, and are especially susceptible to the influence of their peers. When college students have more smoking peers in their social circle, they tend to accept the "normalized" concept of smoking, which may come from peer conversations, behavioral imitation, or positive evaluations of smoking behavior.

Social interactions and peer pressure are particularly important to college students, who tend to align themselves with their peers in order to maintain social relationships and gain acceptance. Thus, when smoking becomes a common behavior at social events, college students may choose to smoke for fear of ostracism or to fit in with the group.

In addition, some studies have found that college students smoke more frequently in social situations (Lu, Huang, Mei, et al., 2021). When meeting with friends, attending parties, or other social events, smoking is often seen as a social ritual that enhances relationships. In such settings, college students may be encouraged by group pressure or peers to start experimenting with smoking, which can lead to long-term smoking habits.

Individuals' perceptions of the harms of tobacco

An individual's knowledge of the dangers of tobacco is an important factor in related his or her smoking behavior. Relevant studies have shown that college students who have a clear understanding of the dangers of tobacco are more likely to resist the

temptation to smoke, Health knowledge education can effectively reduce the willingness to smoke（Wu, 2023).However, there are still misunderstandings and blind spots in college students' knowledge of the dangers of tobacco(Sun et al., 2024). For example, some college students believe that smoking can refresh their minds and relieve stress, or that smoking is a way of socializing. These misconceptions make it easier for them to fall into the trap of smoking. In a study conducted by Hu (2022), it was found that most of the students' knowledge of the harms of smoking and secondhand smoke was still limited to respiratory diseases such as lung cancer and chronic bronchitis, and their knowledge of smoking and secondhand smoke as an important risk factor for cardiovascular diseases was relatively low. This lack of comprehensive awareness extends beyond college students; Guan et al. (2024) found that among residents aged ≥18 years in Jiangsu Province, awareness of tobacco-related health risks (e.g., cardiovascular diseases) remained low, with only 34.2% recognizing smoking as a major risk factor for heart disease. Some studies have also pointed out that Cognitive Behavioral Therapy (CBT) is able to reduce dependence levels, smoking cravings, and effectively improve the mental health of individuals who are addicted to smoking (Liu, 2024).Such gaps in public health literacy may contribute to the persistence of smoking behaviors. The current situation of smoking among college students is worrying, and there is a general lack of knowledge about the dangers of tobacco.

Attitudes towards smoking

Gao et al., (2020) found that through multiple regression analysis, the predictive validity of smoking attitude on smoking behavior ($\beta=0.42$, $p<0.01$) ranked second among many nfluencing factors, only behind the peer smoking pressure variable. This result highlights the important role of cognitive evaluation in the formation of

smoking behavior. This study not only provides strong support for the attitude-behavior consistency hypothesis, but also accumulates empirical experience for the design of tobacco control intervention programs based on cognitive reconstruction, which further suggests that campus health promotion work should focus on strengthening the correction and guidance of smoking-related cognitive biases. Specifically, campuses can help students deeply understand the real harm of smoking and break the wrong cognitions such as "smoking shows maturity" and "smoking can relieve stress" through special lectures, workshops and interactive educational activities. At the same time, teaching methods such as role-playing and group discussions are introduced to encourage students to examine smoking behavior from different perspectives and cultivate their critical thinking ability, so that they can stick to healthy choices when facing peer pressure or social temptations. In addition, establishing a campus support system, such as a psychological counseling hotline and peer education groups, to provide timely help and guidance to students who have a tendency to smoke or have tried smoking is also an effective way to correct cognitive bias and promote healthy behavior changes. Through the implementation of these comprehensive measures, the campus can gradually build an environment that is not conducive to the breeding of smoking behavior and safeguard the healthy growth of students.

Research on countermeasures to control smoking among college students

Smoke-free campus environment

The construction of a smoke-free campus environment is crucial to controlling college students' smoking behavior. Colleges and universities should formulate strict no-smoking policies, specify no-smoking areas, and strengthen the supervision and punishment of smoking behavior on campus. At the same time, colleges and universities can provide students with a more comfortable and healthy campus environment by improving the campus environment, such as increasing the area of greenery and setting up rest areas, to reduce the incentives for smoking.

Zeng et al. (2019) conducted a study and found that before and after the construction of the "smoke-free campus," the knowledge rate of the health hazards of smoking increased from 24.35% to 34.55%, suggesting that the construction of the "smoke-free campus" has achieved a certain effect.

The construction of smoke-free campus environments has received extensive attention and research both at home and abroad. Studies have shown that the implementation of smoke-free policies has had a positive impact on campus health. On the one hand, the smoke-free policy helps to reduce the use of tobacco and lower the smoking rate. In the United States, with the promotion of smoke-free policy, the smoking rate of college students has decreased year by year, from 20.5% in 2005 to 15.5% in 2016. On the other hand, smoke-free policies provide a healthier and fresher learning and working environment for students and faculty. Studies have shown that smoke-free campuses can reduce the risk of students being exposed to secondhand smoke and reduce health problems caused by smoking (Blake et al., 2020). Through

the construction of smoke-free campuses, the knowledge of the health hazards of smoking has been increased. This helps to further reduce smoking behavior on campus.

Health education

School health education is a key link in controlling college students' smoking behavior. Some studies have also pointed out that Cognitive Behavioral Therapy (CBT) is able to reduce dependence levels, smoking cravings, and effectively improve the mental health of individuals who are addicted to smoking (Liu, 2024).Through diversified forms of health education, we can effectively intervene in smoking behavior. These educational measures not only make college students more deeply aware of the hazards of tobacco, but also motivate them to change their attitudes towards smoking, strengthen their determination to stay away from cigarettes, and ultimately help them get rid of the bad habit of smoking. Schools have incorporated tobacco control advocacy courses into their teaching activities, held health education lectures, and organized publicity campaigns with the theme of the dangers of smoking, with the aim of strengthening the health awareness of college students. Through systematic health education, university students are able to acquire valuable knowledge and practical skills about health that will stay with them throughout their lives. At the same time, schools provide external environmental support that is conducive to the development of healthy behaviors, creating a favorable atmosphere for college students to refuse to smoke.

The theoretical bases of health behaviors often used in school tobacco control health education programs include the Knowing-Believing-Acting model, behavioral change theory, the Health Belief Model, and the Theory of Planned Behavior, which

provide strong guidance and support for program design and implementation (Wang, 2021).

Deficiencies in previous research and the content of the current study

Shortcomings of previous studies

From the information collected so far on this topic, it can be found that they cover multiple aspects of research on college students' smoking behaviors, including tobacco hazards, health effects of smoking, risks of e-cigarettes, trends in college students' smoking prevalence, personal perceptions of tobacco hazards, family influences, and campus culture and policy influences in a variety of dimensions. However, there are some shortcomings in these studies. First, although most of the studies used questionnaires, this method may be subjective and subject to memory bias. In addition, some of the studies lacked in-depth qualitative analysis or interviews to comprehensively capture the real thoughts of college students and the deep-rooted reasons behind smoking behavior. A variety of factors influencing college students' smoking behavior were mentioned in the above studies, but there may be other important influences that have not been fully considered.

Content of this study

In view of the above deficiencies in the research, the next research on this topic should focus more on the following aspects:

1. Adopting diversified research methods: using the latest data and combining questionnaire surveys, in-depth interviews, observation methods and other research

methods in order to gain a more comprehensive understanding of the current situation of college students' smoking behaviors and the factors relate them.

2. Further explore the knowledge, attitude, and socio-cultural factors behind college students’ smoking behavior.

Previous Research on Smoking among Students

Empirical studies conducted on similar topics

1. Research in China

Qin Maohua, Zhang Qinglan et al. (2024) conducted a questionnaire survey to study smoking among students in grades 1-4 in three large higher vocational colleges and universities in the southwestern region of Shandong, including Jining, Zaozhuang, and Heze. A total of 7,365 students were included in the survey, and the results showed that the smoking prevalence of male students was significantly higher than that of female students, and the prevalence of smoking tended to increase with the increase of grade level.

Zhong Qing and Xiong Yuehua et al. (2024) used a multi-stage stratified whole cluster random sampling method to extract high school students in Wuhan city as the survey object, and conducted a questionnaire survey on basic information, e-cigarette use and secondhand smoke exposure to analyze the rate of e-cigarettes attempted use and the rate of current use among high school students, and the results of the study showed that the rate of e-cigarettes current use among high school students in Wuhan city was 2.03%, and that males, vocational high schools , private high schools,

students with secondhand smoke exposure and good friends who smoke may be more inclined to use e-cigarettes.

Luan (2024) used semi-structured interviews and observation to collect smoking-related information and a combination of the 5A+5R intervention method (ask, advise, assess, help, follow up + relevance, risk, benefit, barrier, repeat) and the family support method to intervene in the smoking behavior of service recipients among vocational school students, and the results of this study found that the effectiveness of the intervention in terms of both smoking behavior modification and parent-child relationship modification was achieved. The results of this study found that the main factors affecting the development of smoking behavior in the clients were the key to the intervention.

Bi Chen (2020) conducted a questionnaire survey on smoking behavior in 29 middle schools in Shanghai, including Shanghai's key middle schools, key high schools, private middle and high schools, and some vocational schools, and designed a questionnaire from the construction of the campus tobacco control system, the school tobacco control education and publicity, and the construction of the school environment both inside and outside the school, and the results of this study showed that the influence of the internal and external environments of the school on the smoking behavior of secondary school students was at an intermediate to advanced level. The results show that the influence of the internal and external school environments on secondary school students' smoking behavior is at an upper-middle level.

Li Jia (2023) of Zigong City, Sichuan Province, Fushun County, Guangyuan City, Qingchuan County and Xide County, Liangshan Prefecture, as a survey area, the survey analyzed the current situation of smoking behavior of rural residents in Sichuan

Province, the level of self-control, emotional and time preference situation, the study were sampled residents 3621, included in the analysis of 3416, the results of the survey showed that:, gender, age, education, occupation, marital status, personal annual income The results showed that gender, age, education, occupation, marital status, annual personal income, and other socio-demographic characteristics are all factors influencing smoking behavior.

2. Overseas related research

Nancy A. Rigotti, MD, et al. (2022) found in a review of research on treatments for smoking that in a meta-analysis that included 19,488 smokers, the combination of medication and behavioral counseling resulted in a 6-month cessation rate of 15.2% compared with a cessation rate of 8.6% for brief advice or usual care, suggesting that combining brief advice to quit from a clinician with assisted cessation The results suggest that combining brief advice from clinicians to quit smoking with assisted cessation treatment is effective in the routine treatment of tobacco users.

Andrea S. Gentzke, PhD, et al. (2022) reported on the 2021 National Youth Tobacco Survey (NYTS), an annual, cross-sectional, school-based, self-administered survey of U.S. middle school (grades 6-8) and high school (grades 9-12) students, which included 20,413 students from 279 schools (for a sample of 25,149 students; student response rate of 81 2%). The survey included 20,413 students from 279 schools (25,149 total students in the sample; 81.2% response rate) and found that: current (past 30-day) use of tobacco products ranged from 13.4% among high school students to 4.0% among middle school students; and, among students who currently used tobacco products, the most commonly reported source of tobacco products was a friend (32.8%).

Abigail S Friedman et al. (2020) analyzed data from 2011-2016 in the "Risk Trends in Selected Metropolises/Metropolitan Areas" dataset using the Behavioral Risk Factor Monitoring System. Differential regression and triple difference regression estimated the relationship between local tobacco-21 policies and smoking among adolescents aged 18 to 20 years living in MMSA (Metropolitan/Metropolitan Statistical Area and Metropolitan Subdistrict). The results showed that the local "Tobacco-21" policy significantly reduced the smoking rate among adolescents aged 18 to 20 years living in the MMSA area.

Abdulsalam M A Nasser et al. (2020) summarized 469 cross-sectional studies on student smoking from April 2018 to June 2019 and found that smoking prevalence increased with age and length of study, and there was a significant association between students' age and smoking tendency, and there was a statistically significant upward trend in smoking risk from first-year freshmen to graduating students. This may be due to the fact that older students spend more time in college settings being exposed to older smokers (teachers, colleagues, friends, etc.), and their attitudes can be strongly influenced by older smokers.

Prabhat Jha (2020) summarized the harms of smoking and the benefits of quitting smoking based on data from Canada, United States, and United Kingdom, and found that smokers who started smoking in early adulthood and continued to smoke were more likely to eventually die from smoking, and smoking can also lead to a variety of diseases, including lung cancer, emphysema, heart disease, stroke, upper respiratory tract cancer, bladder cancer, and various other diseases.

Shortcomings and limitations of previous research related to this topic

Although the above-mentioned domestic and international studies have made significant progress in exploring smoking behaviors, related factors, and interventions among different age groups, geographic regions, and specific groups (e.g., students), some limitations remain. First, although studies on factors related smoking behavior have identified a variety of socio-demographic characteristics and environmental factors, in-depth analysis of some social and cultural factors has often been neglected. In addition, regarding the evaluation of the effectiveness of interventions, although some studies have shown positive results, there is a relative lack of long-term tracking data, making it difficult to comprehensively assess the sustained effectiveness and long-term impact of interventions. Therefore, future research needs to explore in depth the multilevel related factors, such as increasing tobacco prices and tobacco advertising, in order to develop more precise and effective tobacco control strategies.

Conceptual Framework

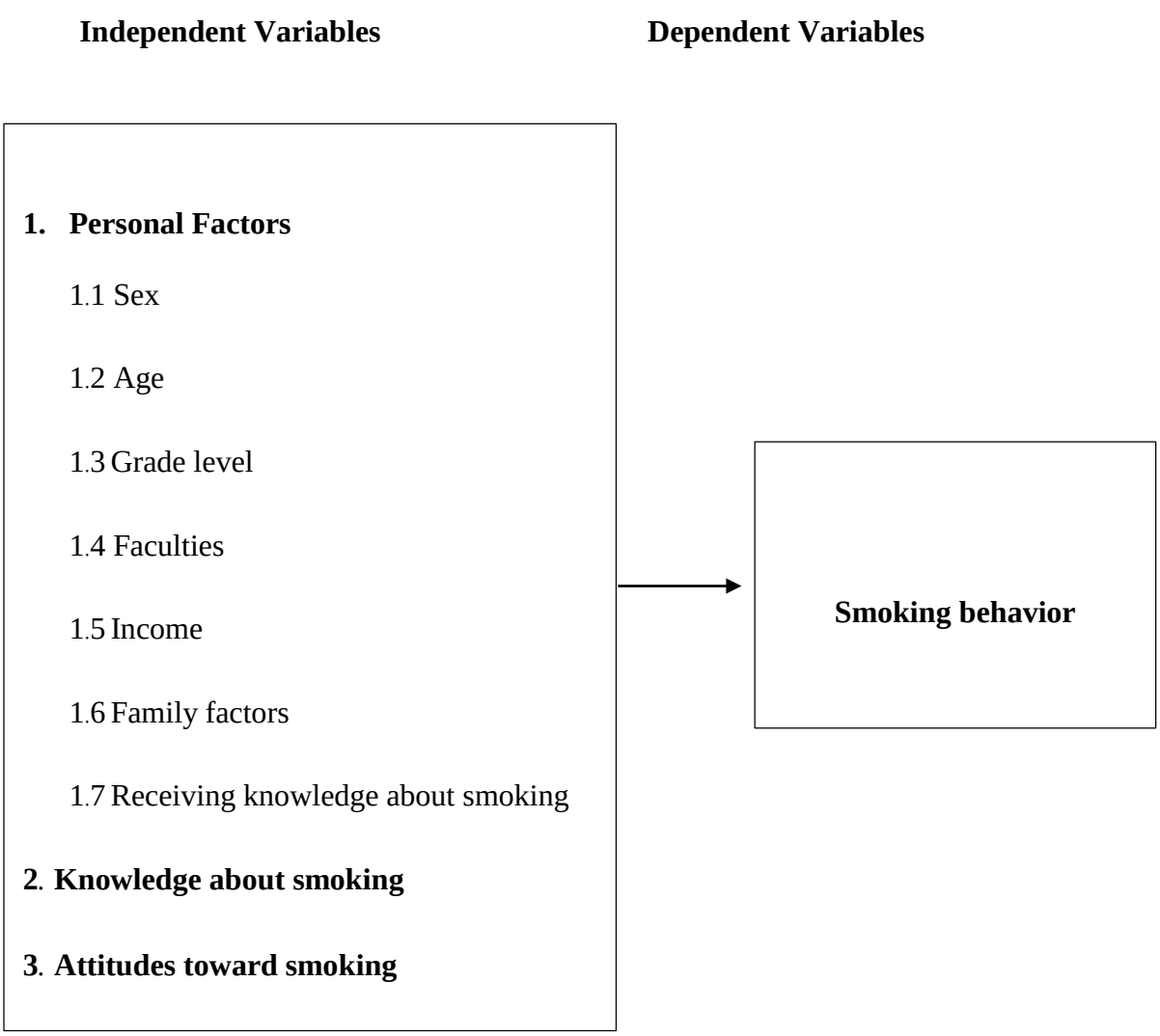

Figure 1 Conceptual Framework

CHAPTER III

RESEARCH METHODOLOGY

This chapter mainly studies the smoking behavior of students at Hainan University of Science and Technology in Yunlong Campus,the factors affecting the smoking behavior of students at Hainan University of Science and Technology in Yunlong Campus, and other methods as follows:

1. Research design
2. Population and sample size
    2.1 Population
    2.2 Sample Size and Sampling Technique
    2.3 Inclusion Criteria
    2.4 Exclusion Criteria
3. Study area
4. Study period
5. Research method
    5.1 Literature Review Method
    5.2 Questionnaire Survey Method
    5.3 Mathematical and statistical methods
    5.4 Quality control
6. Measurement instruments
    6.1 Measurement Tool
    6.2 Tool development process
    6.3 Research tool quality

6.4 Reliability

7. Data collection
8. Data analysis

Research design

The present study was a cross-sectional analytical study design research aimed at exploring the factors related with smoking behavior among students at Hainan University of Science and Technology in Yunlong Campus.

Population and sample size

Population

The population for this study consists of 14,187 students at the Hainan Vocational University of Science and Technology in Yunlong Campus in Haikou, Hainan Province. (Data from the official website of Hainan Vocational University of Science and Technology).

Sample

Inclusion and Exclusion Criteria

To ensure the smooth conduct of this research and to safeguard the physical and mental well-being of the participants, the final research subjects were determined based on inclusion and exclusion criteria as follows:

Inclusion Criteria

1. Students aged 18 years or older

2. Willing to participate in the research voluntarily and have signed the informed consent form

3. Able to complete the questionnaire independently and thoroughly

Exclusion Criteria

1. Students with health problems or psychological conditions that may affect their ability to provide accurate information

2. Students who express unwillingness to participate in the research or who withdraw during the data collection process**.**

Sample size

The following formula for determining the required sample size was developed by the renowned American statistician William Gemmell Cochran, a pioneer in the field of survey sampling methodology (Cochran, W. G., 1953). This formula is widely recognized as the "Finite Population Correction (FPC) Sample Size Calculation Formula," and is applicable when sampling from a population with a known finite size.

$$\mathrm{n} = \frac{N \cdot Z^2 \cdot p \cdot (1-p)}{E^2 \cdot (N-1) + Z^2 \cdot p \cdot (1-p)}$$

To calculate the sample size with an additional 10% to account for potential non-responses or other issues, you can use the following method:

Error level=374×10%=37.4 Sample size=374＋37.4≈411

n = sample size

N = population size (14,187 students)

Z = Z-score (the number of standard deviations a data point is from the mean, often 1.96 for a 95% confidence level)

p = estimated proportion of an attribute that is present in the population (if unknown, 0.5 is often used as it provides the maximum sample size)

E = margin of error (often set at 0.05 for a 5% margin of error)

$$n = \frac{14187 \cdot 3.8416 \cdot 0.25}{0.0025 \cdot 141876 + 3.8416 \cdot 0.25}$$

$$n = \frac{14187 \cdot 1.96^2 \cdot 0.5 \cdot (1-0.5)}{0.05^2 \cdot (14187-1) + 1.96^2 \cdot 0.5 \cdot (1-0.5)}$$

$$n = \frac{14187 \cdot 0.9604}{35.465 + 0.9604}$$

$$n = \frac{13627.3548}{36.4254}$$

$$n \approx 3$$

First,calculate 10% of the sample size:

10% of 374=0,1×374=37.4

Then,add this 10% to the original sample size；

374+374.4=411.4

The adjusted sample size is approximately 411 students.

Sampling

This study uses a stratified sampling method to randomly select students from each Faculty. Using the formula to calculate the distribution ratio of students to each Faculty, you need to determine the proportion of each Faculty in the total population and then apply that proportion to the total sample size. The proportion formula is as follows:

$$ni = \frac{\mathrm{N}i}{\mathrm{N}} \times n$$

Where:

ni represents the sample size for each educational level.

n is the total sample size.

N is the population size for each educational level.

Ni is the total population size.

Accidental Sampling After Stratification is applied with the following specific steps:

1. Stratification: Stratification: by the five colleges to which the student belongs

    1.1 College of Medicine,

    1.2 College of Nursing,

    1.3 College of urban construction,

    1.4 College of Accounting,

    1.5 College of Education and Music.

2. Accidental Sampling:

2.1 Request access to student lists from each college's Registrar or Counselor

2.2 Link to generate a questionnaire: Create an anonymous questionnaire using a questionnaire platform (Questionnaire Star)

2.3 The link to the questionnaire was forwarded to the college group through the counselors or student cadres of each college, and those who voluntarily filled in the questionnaire were considered as a sample, as shown in Table 1.

Table 1 The table presents the population size of each college and the proportionally allocated sample size for each college.

Faculty	**Number of Students**	
	Total	**Selected**
College of Medicine	3,102	90(93)
College of Nursing	5,955	172
College of Urban Construction	2,365	68
College of Accounting	2,021	59(56)
College of Education and Music	744	22
Total	**14,187**	**411**

Note: Finally, the sample size of this study was determined to be 411 students.

During the actual sampling process, we made appropriate adjustments to the sample size based on the actual situation of each college and the level of student participation. Such adjustments were made to ensure the representativeness of the

sample and the smooth conduct of the study, while the total sample size still met the requirements of the study design.

Study area

At Hainan Vocational University of Science and Technology in Yunlong Campus, Haikou, Hainan Province, China

Study period

3-month study to be completed between November 15, 2024 and February 15, 2025.

Research method

Literature Review Method

1. Focusing on the research objective: in conjunction with the core objective of this study, which is to investigate the related factors of students' smoking behavior Hainan University of Science and Technology in Yunlong Campus , a comprehensive review of the literature of relevant books, papers and other documents at home and abroad was conducted

2. Keyword search: Keyword search: “smoking behavior”, “smoking attitude”, “smoking knowledge”, “college students” and so on The keywords were searched extensively using Chinese and English databases such as CNKI, Wanfang Thesis Database, Wipro, PubMed, Google Scholar, etc.

3. Literature collation and analysis: collect and collate literature related to the smoking behavior of freshmen students in Yunlong College of Community Medicine, Hainan University of Science and Technology, focusing on research results on epidemiological characteristics of smoking behavior, related factors (such as personal factors, family environment, peer influences, and school policies, etc.), hazard perceptions, and the effectiveness of interventions, which will provide references to designing the questionnaires and the framework for data analysis The research results were used to design the questionnaire and the framework for data analysis.

Questionnaire Survey Method

1. Questionnaire design

Based on the literature review, a questionnaire on smoking behavior of students in Yunlong Campus of Hainan University of Science and Technology was designed. The questionnaire consists of four parts:

Part I: Personal information (gender, age, grade, major, income, smoking status of family members and people around, and smoking knowledge received).

Part II: Knowledge about smoking, including the degree of understanding of the diseases caused by smoking and their related health effects among the surveyed population.

Part III: Attitude towards smoking, including whether smokers have a positive or negative attitude towards smoking.

Part IV: Smoking behavior, including whether they smoke, smoking frequency, smoking location, reasons for smoking, and willingness to quit smoking.

2. Questionnaire Evaluation and Revision

Before official distribution, the reliability and validity of the questionnaire will be evaluated through a small pre-survey, and necessary revisions and improvements will be made based on the feedback.

3. Data collection

A online (Questionnaire Star platform will be used to distribute the questionnaires to the students of Hainan University of Science and Technology in Yunlong Campus to ensure the accuracy of the sample.

Mathematical and statistical methods

1. Data pre-processing

The data were cleaned according to the inclusion and exclusion criteria, and invalid and abnormal data were excluded to ensure the accuracy and reliability of the data.

2. Database establishment

Enter valid data into Excel and establish a database for subsequent analysis.

3. Statistical analysis

SPSS 26.0 was used for data analysis. Descriptive statistical analysis and chi-square test were used. Differences were considered statistically significant when the P value was less than 0.05.

Quality control

1. Survey process control

Ensure the normality and standardization of the survey process, clarify the purpose of the survey, the content of the questionnaire and the requirements for filling in and answering the questionnaire, and reduce the subjective bias.

2. Questionnaire Reliability and Validity

Assess the reliability and validity of the questionnaire through the pre-survey to ensure that the questionnaire can accurately reflect the research questions.

3. Data Review and Cleaning

The data were reviewed by using the double entry method, and logical errors and outliers were strictly checked to ensure the authenticity and accuracy of the data.

4. Ethical principles

In the process of data collection and analysis, the ethical principles of scientific research were strictly observed to protect the privacy and rights and interests of the respondents and to ensure the legality and morality of the research results.

Measurement instruments

The questionnaire used in this study consists of four main sections as follows:

Part 1: Personal Information

This section will collect demographic data including: gender, age, grade, course of study, income, whether or not they have received smoking knowledge and attitudes toward smoking.

Part 2: Knowledge about smoking

Knowledge about Smoking:

A self-assessment questionnaire consisting of 10 items was used. Each item was scored from 0 (incorrect) to 1 (correct). The results were categorized into three levels. The classification of knowledge levels follows the learning taxonomy framework using

percentages and grouping, which can be applied to assess students' learning outcomes. This method divides knowledge into three levels as follows:

Low level of knowledge (0–60%)

Moderate level of knowledge (61–70%)

High level of knowledge (80% and above)(Bloom et al., 1956; Anderson & Krathwohl, 2001).

Table 2 Knowledge about smoking Rating Scale

Score	Level
0-5	low knowledge level
6-7	Moderate knowledge
8-10	High Knowledge

Part 3: Attitudes toward smoking

This section consists of a 10-item self-report questionnaire with scales of 1-4 on a Likert scale: to measure respondents' attitudes towards smoking behavior.

Table 3 Smoking Attitude Rating Scale

Positive Question	Score	Negative Question	Score
Strongly disagree	1	Strongly disagree	4
Disagree	2	Disagree	3
Agree	3	Agree	2
Strongly agree	4	Strongly agree	1

The results are divided into 3 levels as follows:

To divide the score from 10 to 40 three equal ranges, we use the class interval formula:

$$\text{Class Interval} = \frac{Maximum\ Score - Minimum\ Score}{3}$$

$$\text{Class Interval} = \frac{40-10}{3} = 10$$

Table 4 Smoking Attitude Rating level Scale

Score	Level
10.00-19.00	negative attitude
20.00-29.00	moderate attitude
30.00-40.00	positive attitude

Part 4: Smoking Behavior

This section will include: whether you smoke, your age, reasons for smoking, brands, how often you smoke, when you smoke, where you smoke, how you feel when you smoke, symptoms of not smoking, where you buy cigarettes, average daily smoking expenses, and willingness to quit smoking.

Data collection

In this study, the researcher will follow the following steps to collect data:

1. apply for authorization letter from I-SEM, Chiang Rai Rajabhat University to approve the data collection process.

2. Coordinate with related fields to collect data using questionnaires.

3. coordinate with the heads of departments to arrange the date of data collection for the sample group in each college to collect data using questionnaires.

4. the questionnaire used for data collection has been validated by three experts with a validity of ＞0.6, The reliability of the questionnaire used for data collection has been calculated from a sample group of 30 persons similar to the target population of the study and the reliability is 0.88.

5. Data has been collected from a sample group of 411 persons who are the target population of the study.

6. Verify the accuracy and completeness of the data obtained from the questionnaire.

7.Compile the data and analyze it statistically.

Data analysis

Descriptive statistics:

Used to describe the distribution of basic characteristics and smoking behavior of the sample.

Frequency distribution: Used to analyze the distribution of personal information such as gender, age, and monthly pocket money.

Mean, and standard deviation: Used for knowledge level, attitude level, etc. to understand the distribution by calculating statistics.

Percentage: Used to describe the proportion of smoking behavior, etc., such as whether or not to smoke, frequency of smoking, and willingness to quit.

chi-square test.

Used to explore whether there is a significant difference between smoking behavior and other factors.

CHAPTER IV

RESULTS AND DISCUSSION

This research is a study of Student Smoking behavior and factors related with the smoking behavior of students at Hainan Vocational university of science and Technology in Yunlong Campus. Data was collected from a sample of 411 individuals, selected using stratified sampling. The data collection instrument was a questionnaire. The data collected were analyzed, and the results of the analysis can be categorized as follows:

Part I: General Information of the Respondents

Part II: Analysis of Smoking Knowledge Among Students at Hainan Vocational university of science and Technology in Yunlong Campus.

Part III: Analysis of Attitudes Toward Smoking Among Students at Hainan Vocational university of Science and Technology in Yunlong Campus.

Part IV: Analysis of Smoking Behavior Among Students at Hainan Vocational university of Science and Technology in Yunlong Campus.

Part V: Analysis of Factors Associated with Smoking Behavior Among Students at Hainan Vocational university of science and Technology in Yunlong Campus

Part I: General Information of the Respondents

Table 5 Number and Percentage of the Sample Group Classified by Gender.

Gender	Number	Percentage
Male	143	34.80
Female	268	65.20
Total	**411**	**100.0**

As can be seen from Table 5, the total number of respondents in this study was 411. In terms of Gender, 143 respondents were male, accounting for 34.80% of the total number of respondents, and 268 respondents were female, making up 65. 20% of the total number of respondents.

Table 6 Number and Percentage of the Sample Group Classified by Age.

Age	Number	Percentage
18-20 years old	217	52.80
21-23 years old	194	47.20
24 years and over	0	0
Total	**411**	**100.0**

The age distribution in Table 6 indicates that the 18 - 20 years old age group accounted for the largest proportion, with 217 individuals (52.80%). This was followed by the 21 - 23 years old age group, which had 194 individuals (47.20%), and the 24 years and over age group, with 0 individuals.

Table 7 Distribution of the Sample Group by Grade Level (Number and Percentage)

Your grade level	Number	Percentage
first-year	112	27.25
second-year	105	25.55
third-year	98	23.84
fourth-year	96	23.36
Total	**411**	**100.0**

The distribution of students by Your grade level in Table 7 indicates that the proportions of students from first - year to fourth - year grade levels in the survey were relatively balanced, with minimal differences. Overall, the proportion of first - year students in the survey was the highest, accounting for 112 students (27.25%), and the proportion of fourth - year students was the lowest, with 96 students (23.36%).

Table 8 Number and Percentage of the Sample Group Classified by Course of Study.

Faculties	Number	Percentage
Music and Education	22	5.35
Nurse	172	41.85
Accounting	56	13.62
Urban construction	68	16.55
Medicine	93	22.63
Total	**411**	**100.0**

The distribution of faculties in Table 8 shows that the Faculty of Nursing had the majority of respondents with 172 or 41.85% of the total number of respondents surveyed, while the Faculty of Music and Education and the Faculty of Accounting had fewer respondents with 22 and 56 or 5.35% and 13.62% respectively.

Table 9 Number and Percentage of the Sample Group Classified by Monthly Allowance.

Monthly Allowance	Number	Percentage
≤500	89	21.70
500 - 1,000	109	26.50
1,001 - 1,500	115	28.00
1,501 - 2,000	56	13.60
≥2,000	42	10.20
Total	**411**	**100.0**

From the distribution of Monthly Allowance in Table 9, the number of people with Monthly Allowance in the range of 1001 - 1500 yuan was the largest, with 115 people (28.00%), followed by the range of 500 - 1000 yuan, with 109 people (26.50%), and the group with Monthly Allowance of ≥2000 yuan was the smallest, with only 42 people (only 10.20%).

Table 10 Number and Percentage of the Sample Group Classified by Smoking of Family Members and People Around.

Smoking by Family Members and People Around	**Number**	**Percentage**
No	156	37.96
Yes	255	62.04
Total	**411**	**100.0**

From the above table 10, it can be observed that regarding Smoking by Family Members and People Around the respondents, firstly, there are 255 cases where family members or people around the respondents engage in smoking behavior, accounting for 62.04%. In contrast, there are 156 cases where family members or people around the respondents do not engage in smoking behavior, which makes up 37.96%.

Table 11 Number and Percentage of the Sample Group Classified by Receiving Knowledge About Smoking.

Receiving Knowledge About Smoking	Number	Percentage
Not Received	127	30.90
Received	284	69.10
Total	**411**	**100.0**

From Table 11 above, it can be observed that concerning Receiving Knowledge About Smoking, 284 respondents (69.10%) indicated that they had received knowledge about smoking, while 127 respondents (30.39%) had not received knowledge about smoking.

Part II: Analysis of Smoking Knowledge Among Students at Hainan Vocational university of Science and Technology in Yunlong Campus.

Table 12:Number and Percentage of smoking knowledge categorized by correct and incorrect responses.

Smoking-related knowledge questions.	Correct respondents.		Incorrect respondents.	
	Number	Percentage	Number	Percentage
1. Do you know which disease smoking increases the risk of the most.	123	29.93	288	70.07

Table 12 (Continued)

Smoking-related knowledge questions.	Correct respondents.		Incorrect respondents.	
	Number	**Percentage**	**Number**	**Percentage**
2. Which substances in cigarettes causes addiction.	101	24.57	310	75.43
3. How does smoking affect heart health	151	36.74	260	63.26
4. Which type of cancer does smoking most increase the risk of	139	33.82	272	66.18
5. Which body system does smoking damage the most	121	29.44	290	70.56
6. How does tar in cigarettes affect the body	99	24.09	312	75.71
7. Do you know how smoking affects the skin	144	35.04	267	64.96
8. How does smoking affect the lungs	127	30.90	284	69.10
9. What is the long-term health impact of smoking	131	31.87	280	68.13

Table 12 (Continued)

Smoking-related knowledge questions.	Correct respondents.		Incorrect respondents.	
	Number	**Percentage**	**Number**	**Percentage**
10. Do you know if children and the elderly exposed to smokers are at health risk	118	28.71	293	71.29

From table 12, it can be seen from the data in the table that most of the questions had a correct response rate of less than 35%. The question with the highest probability of being answered correctly is Question 3: How does smoking affect heart health, which was answered correctly by 151 people (36.74%), and the question with the lowest rate of being answered correctly is Question 6: How does tar in cigarettes affect the body，which was answered correctly by only 99 people (24.09%).

Table 13 The number and percentage of respondents categorized by the level of smoking knowledge.

Knowledge level.	**Score range.**	**Number**	**Percentage**
Low knowledge	0-5	377	91.73
Moderate knowledge	6-7	28	6.81
High knowledge	8-10	6	1.46
Total		**411**	**100.0**

Mean =3.08 S.D. =1.54, Min =0, Max = 8.00

From table 13, the majority of the respondents had a low level of knowledge about smoking, with a mean score of 3.08 (standard deviation 1.54), a maximum score of 8.00, and a minimum score of 0. The majority of the respondents had a low level of knowledge about smoking. Specifically, there was a high percentage of people with low knowledge, with 377 people (91.73%) falling into the “low knowledge” category, with scores ranging from 0-5 points. The proportion of people with medium knowledge is relatively small, with 28 people (6.81%) falling into the “medium knowledge” category, with scores ranging from 6-7. The percentage of high knowledge is very low, with only 6 individuals (1.46%) falling into the “high knowledge” category, with scores ranging from 8 to 10.00.

Part III: Analysis of Attitudes Toward Smoking Among Students at Hainan Vocational university of Science and Technology in Yunlong Campus.

Table 14 Number and percentage of respondents categorized by their attitude levels toward smoking.

Attitude level	**Score range.**	**Number**	**Percentage**
Negative attitude	10.00-19.00	35	8.51
moderate attitude	20.00-29.00	132	32.12
positive attitude	30.00-40.00	244	59.37
	Total	**411**	**100.0**

From Table 14, it can be seen that among the smoking attitudes, positive attitude has the highest number of 244 (59.37%), followed by moderate attitude of 132 (32.12%) and negative attitude of only 35 (8.51%).

Part IV: Analysis of Smoking Behavior Among Students at Hainan Vocational university of Science and Technology in Yunlong Campus.

Table 15 Number and percentage of sample groups by smoking behavior. (n=411)

Smoking behavior	Number	Percentage
Never smoked	57	13.87
Tried smoking, but currently do not smoke	172	41.85
Currently smoking	182	44.28
Total	**411**	**100.0**

From table 15, the distribution of smoking behavior of the surveyed population, firstly, the surveyed population has the least number of never smokers, only 57 people (13.87%), Tried smoking, but currently do not smoke 172 people (41.85%), and the largest percentage of current smokers has 182 people (44.28%).

Table 16 Number and percentage of sample groups by age at first smoking. (n=354)

Smoking age	Number	Percentage
10-14 years	55	15.54
15-19 years	142	40.11
20-24 years	157	44.35
Total	**354**	**100.0**

From table 16,From the distribution of the age of first smoking, the number of first-time smokers in the age group of 10-14 years old is the least, only 55 people (15.54%); the number of first-time smokers in the age group of 15-19 years old is 142 (40.11%), and the number of first-time smokers in the age group of 20-24 years old is the most, with 57 people (44.35%).

Table 17: Number and Percentage of Sample Groups by Reason or Motivation for Smoking. (n=354)

Causes of smoking	Number	Percentage
Stress/Anxiety	34	9.60
Peer related/imitating friends	79	22.32
To show maturity	106	29.94
Curiosity	42	11.87
For socializing	57	16.10
To build confidence	36	10.17
Total	**354**	**100.0**

From table 17, in terms of the distribution of reasons or motives for smoking, the largest number of people smoked because of To show maturity, 106 (29.94%), followed by Peer related/imitating friend, 79 (22.32%), and Stress/Anxiety, the smallest number of people smoked because of Stress/Anxiety had the least number of smokers with only 34 (9.60%).

Table 18 Number and percentage of sample groups by brand of cigarettes smoked. (n=354)

cigarette brand	Number	Percentage
zhonghua	30	8.47
Hongtashan	65	18.56
Yunyan	74	20.90
Jiaozi	56	15.82
Furongwang	40	11.30
Honghe	40	11.30
Others	49	13.84
Total	**354**	**100.0**

From table 18, in terms of the distribution of cigarette brands smoked, Yunyan was the most preferred brand, with 74 (20.90%), followed by Hongtashan with 65 (18.56%), and zhonghua the least preferred, with only 30 (8.47%).

Table 19 Number and Percentage of Sample Groups Categorized by Mean Daily Cigarette Smoking. (n=354)

Average daily smoking	Number	Percentage
1-3 cigarettes	58	16.38
4-6 cigarettes	133	37.57
7-9 cigarettes	163	46.05
Total	**354**	**100.0**

From Table 19, the distribution of the average number of cigarettes smoked per day is as follows: 7-9 cigarettes per day is the highest number of smokers, with 163 (46.05%); 4-6 cigarettes per day is the second highest number of smokers, with 133 (37.57%); and 1-3 cigarettes per day is the lowest number of smokers, with only 58 (16.38%).

Table 20 Number and percentage of sample groups by frequency of smoking. (n=354)

Frequency of smoking	Number	Percentage
Every day	72	20.34
Every 2-3 day	132	37.29
occasionally	150	42.37
Total	**354**	**100.0**

From Table 20, the distribution of frequency of smoking shows that occasional smokers accounted for the largest number of smokers, with 150(42.37%); Every 2–3 day smokers were the second largest, with 132 (37.29%); and daily smokers were the smallest, with only 72 (20.34%).

Table 21 Number and percentage of sample groups by duration of smoking. (n=354)

Smoking time	Number	Percentage
After meals	38	10.73
In the restroom	86	24.29
after waking up	117	33.05
while drinking alcohol	65	18.36
others	48	13.56
Total	**354**	**100.0**

From Table 21, in terms of the distribution of smoking time, those who preferred to smoke after waking up accounted for the largest proportion, with 117 people (33.05%); those who preferred to smoke in the restroom were the second largest, with 86 people (24.29%); and those who preferred to smoke after meals were the smallest, with only 38 people (10.73%).

Table 22 Number and percentage of sample groups by place of smoking. (n=354)

smoking place	Number	Percentage
College	55	15.54
Dormitories	121	34.18
Park	83	23.45
Smoking areas	57	16.10
Others	38	10.73
Total	**354**	**100.0**

From Table 22, in terms of the distribution of smoking places, those who preferred to smoke in dormitories were the most numerous, with 121 (34.18%); those who preferred to smoke in parks were the next most numerous, with 83 (23.45%); The least number of people preferred to smoke in College and other places with 55 (15.54%) and 38 (10.73%) respectively.

Table 23 Number and Percentage of Sample Groups by Sensation While Smoking. (n=354)

Feelings when smoking	Number	Percentage
relaxed	89	25.14
happy	122	34.46
refreshed	82	23.16
Relieved from anxiety	61	17.23
Total	**354**	**100.0**

From Table 23, the number of people who felt happy while smoking was the highest with 122 (34.46%); the number of people who felt relaxed while smoking was the second highest with 89 (25.14%); and the number of people who felt less anxious while smoking was the lowest with 61(17.23%).

Table 24 Number and percentage of sample groups by symptoms when not smoking. (n=354)

Symptoms when not smoking	Number	Percentage
Irritable	80	22.60
Stressed	118	33.33
Restless	109	30.79
others	47	13.28
Total	**354**	**100.0**

From Table 24, it can be seen that the distribution of symptoms when not smoking is as follows: the number of people who feel most stressed when not smoking is 118 (33.33%), the number of people who feel Restless is the next highest at 109 (30.79%), and the smallest proportion of people who feel irritable and other feelings are 80 (22.60%) and 47 (13.28%), respectively.

Table 25 Number and percentage of sample groups by source of purchase of cigarettes. (n=354)

Sources for purchasing cigarettes	Number	Percentage
Convenience store	62	17.51
Grocery store	145	40.96
Street vendor	147	41.53
Total	**354**	**100.0**

From Table 25, in terms of the distribution of the sources of purchase of cigarettes, the largest number of people bought cigarettes from street vendors, 147 (41.53%); the second largest number of people bought cigarettes from grocery stores, 145 (40.96%); and the smallest number of people bought cigarettes from convenience stores, 62 (17.51%).

Table 26 Number and percentage of sample groups by average daily cigarette expenditure. (n=354)

Average daily expense on cigarettes	Number	Percentage
10 Yuan	54	15.25
20 Yuan	151	42.66
More than 20 yuan	149	42.09
Total	**354**	**100.0**

From Table 26, the distribution of average daily cigarette expenditure shows that 151 people (42.66%) spent 20 yuan on cigarettes daily, 149 people (42.09%) spent more than 20 yuan on cigarettes daily, and 54 people (15.25%) spent 10 yuan on cigarettes daily.

Table 27 Number and percentage of sample groups by Desire to quit smoking. (n=354)

Desire to quit smoking	Number	Percentage
Want ti quit	162	45.76
Do not want to quit	192	54.24
Total	**354**	**100.0**

From Table 27, the distribution of Desire to quit smoking shows that there are 162 people (45.76%) who have the desire to quit smoking and 192 people (54.24%) who have no desire to quit smoking.

Part V: Analysis of Factors Related with Smoking Behavior Among Students at Hainan Vocational university of science and Technology in Yunlong Campus.

Table 28 Relationship between personal information factors and students' smoking behavior

persons Factors	**Smoking behavior**			**X^2**	**P-value**
	Non-smoking	**Tried smoking, but currently do not smoke**	**Currently smoking**		
Gender					
Male	18(12.59%）	63(44.06%）	62(43.36%）	0.557	0.757
Female	39(14.55%)	109(40.67%)	120(44.78%)		
Age					
18-20 years	35(16.13%)	85(39.17%)	97(44.70%)	2.500	0.286
21-23 years	22(11.34%)	87(44.85%)	85(43.81%)		
Grade level					
First-year	19(16.96%)	50(44.64%)	43(38.39%)	7.171	0.305
Second-year	16(15.24%)	35(33.33%)	54(51.43%)		
Third-year	10(10.02%)	47(47.96%)	41(41.84%)		
Fourth-year	12(12.50%)	40(41.67%)	44(45.83%)		

Table 28 (Continued)

persons Factors	Smoking behavior			X^2	P-value
	Non-smoking	Tried smoking, but currently do not smoke	Currently smoking		
Faculties					
Music and Education	3(13.64%)	8(36.36%)	11(50.00%)	8.058	0.428
Nurse	25(14.53%)	65(37.79%)	82(47.67%)		
Accounting	3(5.36%)	26(46.43%)	27(48.21%)		
Urban construction	13(19.12%)	30(44.12%)	25(36.76%)		
Medical	13(13.98%)	43(46.24%)	37(39.78%)		
Monthly allowance					
≤500	12(13.48%)	32(35.96%)	45(50.56%)	5.763	0.674
500-1000	18(16.51%)	47(43.12%)	44(40.37%)		
1001-1500	11(9.57%)	53(46.09%)	51(44.35%)		
1501-2000	10(17.86%)	24(42.86%)	22(39.29%)		
≥2,000	6(14.29%)	16(38.10%)	20(47.62%)		
Smoking by Family Members and People Around					
No	45(28.85%)	97(62.18%)	14(8.97%)	136.288	< 0.001**

Table 28 (Continued)

persons Factors	**Smoking behavior**			**X^2**	**P-value**
	Non-smoking	**Tried smoking, but currently do not smoke**	**Currently smoking**		
Yes	12(4.71%)	75(29.41%)	168(65.88%)		
Receiving Knowledge About Smoking					
Not Received	13(10.24%)	43(33.86%)	71(55.91%)	10.160	0.006**
Received	44(15.49%)	129(45.42%)	111(39.08%)		

From Table 28, there was a statistically significant correlation between smoking behavior of family members or people around them and smoking behavior, and whether they had received knowledge about smoking and smoking behavior at a statistical level of 0.05 ($p<0.05$).

Table 29 Relationship between knowledge factors and students' smoking behavior.

Knowledge factors	Smoking behavior			X^2	P-value
	Non-smoking	Tried smoking, but currently do not smoke	Currently smoking		
Low knowledge	45(11.94%)	156(41.38%)	176(46.68%)	24.459	＜0.001**
Moderate knowledge	8(28.57%)	14(50.00%)	6(21.43%)		
High knowledge	4(66.67%)	2(33.33%)	0		

From Table 29, it can be seen that there is a significant correlation between knowledge factor and students' smoking behavior at 0.05 statistical level.

Table 30 Relationship between attitude factors and students' smoking behavior.

Attitude factors	**Smoking behavior**			**X^2**	**P-value**
	Non-smoking	**Tried smoking, but currently do not smoke**	**Currently smoking**		
Negative attitude	9（25.71%）	15（42.86%）	11（31.43%）	12.160	0.016*
moderate attitude	20（15.15%）	64（48.48%）	48（36.36%）		
positive attitude	28（11.48%）	93（38.11%）	123（50.41%）		

From Table 30, there is a significant correlation between attitudinal factors and students' smoking behavior at 0.05 statistical level

CHAPTER V

CONLUSION AND DISCUSSIONS

The title of the study was factors related smoking among behavior students at hainan vocational university of science and technology in yunlong campus. This study aims to study the Student Smoking behavior at Hainan Vocational university of science and Technology in Yunlong Campus and to study the factors related with the smoking behavior of students at Hainan Vocational university of science and Technology in Yunlong Campus.. The study population consisted of 411 parents, and the sample size was determined using Taro Yamane's formula, resulting in a final sample of 411 participants, selected through stratified sampling. The study utilized a structured questionnaire, which comprised the following sections: Section1:Personal Information, Section 2: Knowledge about smoking, Section 3: Attitudes toward smoking, Section 4: Smoking behavior. Data were analyzed using statistical software, employing the following statistical methods: Frequency distribution, Percentage, Mean, Standard deviation, chi-square (math.) test. The research findings are structured as follows:

1. Conclusion
2. Discussion
3. Generalizability
4. Recommendation for Further Research

Conclusion

The findings of this study provide a comprehensive overview of the smoking-related characteristics among students at Hainan Vocational University of Science and Technology, Yunlong Campus.

Personal information

Among the 411 participants, the majority were female (65.20%), while males accounted for 34.80%. Most students were aged between 18–20 years (52.80%). The highest proportion of students were in their first year of study (27.25%), with the largest academic representation from the School of Nursing (41.85%). In terms of economic background, the most common monthly pocket money range was 1,001–1,500 yuan (28%). Regarding social influence, 62.04% of participants reported that family members or people around them smoked, while 69.10% of students had received knowledge about smoking, compared to 30.90% who had not.

Level of smoking knowledge

The majority of students (91.73%) demonstrated a low level of knowledge about smoking, while only 1.46% exhibited a high level of smoking-related knowledge.

Level of smoking attitudes

There was a statistically significant relationship between students' smoking attitudes and their smoking behaviors ($p < 0.001$). Most students (59.37%) held positive attitudes toward smoking, while only 8.51% had negative attitudes.

Smoking behavior

In terms of smoking behavior, the largest group consisted of students who currently smoke (44.28%), followed by those who had tried smoking but were not currently smoking (41.85%). Only a small proportion (13.87%) had never smoked.

These findings highlight the urgent need for targeted tobacco control programs and educational interventions to improve smoking-related knowledge, reshape attitudes, and reduce smoking prevalence among vocational university students in this setting.

Discussion

1. Differential analysis of gender in smoking among college students .according to the research data results, among the 411 respondents, the proportion of females (65.20%) was higher than that of males (34.80%). This gender distribution bias may be due to the relatively large number of respondents from the School of Nursing, where the number of female students is generally higher than that of male students. It is worth noting that our results show that there is no statistically significant difference in smoking behavior between male and female respondents, as evidenced by the comparable smoking rates of the two groups. This suggests that gender, as an independent variable, does not have a significant impact on smoking behavior.

This finding is consistent with the findings of Qin et al. (2021), who also pointed out that there are no significant gender differences in smoking patterns. Therefore, our study effectively echoes the multidimensional research framework established in the existing literature, reinforcing the view that gender itself is not a decisive factor in predicting smoking behavior.

In addition, these findings also emphasize that the explanatory power of gender as an independent variable in the study of smoking behavior is weakening. This trend is closely related to the evolution of global gender equality issues (Wu, 2023). The study argues that as social norms and gender role concepts continue to evolve, traditional gender-based determinants of health behavior (such as smoking) may become less obvious. Therefore, future research in this area should consider incorporating a wider range of factors, including social, cultural, and psychological factors, to more fully elucidate the complex dynamics behind smoking behavior.

2. Differential analysis of age in smoking among college students the results of this study indicate that age is not a statistically significant factor affecting smoking behavior among students at Hainan University of Science and Technology in Yunlong Campus . This finding is in stark contrast to the trend of Lin Zhu et al. (2019), who reported a nonlinear relationship between smoking prevalence and age. Their study showed that the interaction between age and smoking behavior is complex and multifaceted, related by multiple factors such as personal health cognition, the impact of tobacco control policies, and physiological dependence on nicotine. However, our results suggest that age may not be a determining factor for starting or continuing smoking in the college population. A possible reason for this finding is that the relatively narrow age range of college students may limit differences in smoking behavior caused by age differences alone, as age homogeneity may mask potential age-related trends observed in a wider age group. Second, the strong related of peer related and the unique social environment of college life—students of similar age share similar experiences, stresses, and lifestyles—may weaken the impact of age as an individual factor (Alasqah et al., 2019; Nasser et al., 2020).

These insights have important implications for tobacco control interventions targeting college students, suggesting that efforts should focus on factors other than age.

3. Differential analysis of grade level in college student smoking this study found that there was no significant correlation between the grade and smoking behavior of students at the Yunlong Campus of Hainan University of Science and Technology, which contrasts with the results of some existing studies. Nasser et al. (2020) pointed out in a review of 469 cross-sectional studies worldwide that the smoking rate of college students increased significantly with grade, and believed that senior students were more likely to form habits due to long-term exposure to campus smoking culture and peer related. However, combined with the age-smoking nonlinear relationship theory proposed by Lin Zhu et al. (2019), the results of this study may reflect that the school's tobacco control policy (smoke-free campus environment verified by Zeng Wen et al., 2019) or health education intervention (cognitive behavioral intervention emphasized by Wang Wen, 2021) effectively weakened grade-related risk factors, indicating that environmental intervention may shape smoking behavior patterns more significantly than individual characteristics.

4. Differential analysis of majors in smoking behavior among college students.the results of the data analysis showed that there was little difference in smoking prevalence among students of various majors, and there was no significant relationship between majors and the smoking behavior of college students in this university. Some studies have found that medical students differ from other majors in their smoking behavior, and medical students have relatively lower smoking rates than other majors (Wang et al., 2021) . This result in the current study may be due to the fact

that the university's education on the dangers of smoking is consistent for all majors (including medicine), and medical students do not receive more in-depth training on tobacco control, then their smoking behavior may converge with students in other majors.

5. Differential analysis of Monthly allowance in college students' smoking behavior from the results of data analysis, there is no significant relationship between monthly living expenses and smoking behavior of college students in this university. Economic conditions may affect tobacco purchasing power but are not the determining factor. For example, the effect of economy on smoking behavior was not highlighted in the study of Vivian Zheng (Zheng et al., 2019), which pointed out that low-priced cigarettes (e.g., 5 - 10 yuan per pack) are widely available in the Chinese market and are affordable even for students with low monthly living expenses. Teenage smokers are more likely to choose cheap brands or loose cigarettes to share, lowering the financial threshold that limits smoking behavior. In addition, the prevalence of a “pass the cigarette” culture in social situations, where students may obtain tobacco through peer sharing, further weakens the impact of personal economic conditions.

6. Differential Analysis of Smoking by Family Members and People Around and College Students' Smoking Behavior.The results of this study show that family/peer smoking is significantly related with smoking behavior among students at the Yunlong Campus of Hainan University of Science and Technology. The smoking rate of students who are smoking by Family Members and People Around is significantly higher than that of students whose family members and people around them do not smoke. which is consistent with some relevant literature. From the perspective of the family, Zeng (2018) and Jiang & Tian (2022) both confirmed that parental smoking behavior

increases the risk of smoking for children through behavioral imitation mechanisms, and that long-term passive smoking experience in the family environment weakens adolescents' perception of tobacco hazards. This intergenerational transmission effect may be weakened in college students due to leaving home and living independently, but the cognitive patterns formed in childhood will continue to early adulthood through "psychological inertia". In terms of peer related, the empirical study of Lu et al. (2021) showed that peer smoking behavior in social situations causes individuals to "conform to the crowd" through social normative related, while the cross-national data of Nasser et al. (2020) further revealed that senior students' risk perception threshold will be reduced due to "social contact fatigue" due to long-term exposure to peer smoking networks. It is worth noting that Gao et al(2020) found in a model validation based on the theory of planned behavior that the predictive power of peer pressure on smoking behavior (β=0.42) is second only to direct behavioral demonstration, which suggests that intervention strategies need to focus on both explicit behavioral imitation and implicit attitude shaping. Combined with social learning theory (Bandura, 1977), the results of this study suggest that tobacco control policies need to go beyond the individual level and effectively block the social transmission chain of tobacco use through coordinated intervention of the family-campus-peer network.

7. Results and discussion on smoking behavior of students at Hainan University of Science and Technology in Yunlong Campus.The results of this study show that the smoking behavior of students at Hainan University of Science and Technology in Yunlong Campus presents significant characteristics: current smoking rate (44.28%) and Tried smoking, but currently do not smoke rate (41.85%). This is inconsistent with the results of previous studies. Related studies have found that the

current smoking rate of Wuhan Art Colleges is 15.98% and the trial smoking rate is 26.58% (Lu et al., 2024). The smoking rate of Shaanxi vocational colleges is 27.10% (Zhao et al., 2023). This difference may be due to the combined effect of multidimensional related factors: First, Hainan's unique tropical leisure culture and vocational school training scenes may strengthen the social attributes of tobacco; secondly, the internship employment pressure and peer-induced behavior faced by vocational school students may aggravate the spread of smoking behavior; thirdly, the weak implementation of campus smoking control measures in hidden spaces such as training sites and dormitory areas, as well as the lack of supervision of new tobacco products such as e-cigarettes, may lead to actual smoking rates higher than policy perfection.

8. Knowledge factor and smoking behavior outcome analysis.The results showed that there was a significant correlation between smoking knowledge level and smoking behavior among students at Hainan University of Science and TechnologyYunlong Campus . This result is highly consistent with health behavior theory and empirical research. From the perspective of cognitive intervention, Wu (2023)'s research shows that individuals with a clear understanding of the harm of tobacco have a significantly higher willingness to resist smoking than those with vague cognition.

At a deeper level, Gao et al. (2020)'s findings based on the theory of planned behavior reveal that the predictive power of smoking attitudes on behavior is second only to peer pressure, and knowledge acquisition is the core driving force of attitude reshaping. When students learn scientific evidence such as "smoking increases the risk of lung cancer by 20 times" (Zhao et al., 2022) or "nicotine damages adolescent brain

development" (Chen et al., 2023), their cognitive cost-benefit assessment of smoking behavior will undergo a fundamental change.

9. Outcome Analysis of Smoking Attitude and Smoking Behavior.This study shows that there is a significant correlation between smoking attitude and behavior among students at Hainan University of Science and Technology in Yunlong Campus a result that is highly consistent with the findings of Gao et al. (2020). Its multiple regression analysis shows that the predictive power of smoking attitude on behavior ($\beta=0.42$, $p<0.01$) is second only to the peer pressure variable, revealing the core role of cognitive evaluation in behavioral decision-making. Combined with the survey results of Li et al. (2017) on 91 college students-47% of the respondents had tried smoking because of "pursuit of fashion" or "social needs", it can be shown that students with a positive attitude towards smoking are more likely to try smoking. In addition, the cognitive blind spots such as "smoking can refresh" pointed out by Sun et al. (2024) further explain the triggering mechanism of attitude on initial behavior. The results of the study suggest that campus smoking control needs to focus on cognitive intervention, and block the "attitude-behavior" conversion path by breaking down wrong beliefs and reconstructing the social attributes of healthy behaviors.

Generalizability

The results of this study are generalizable within the following contexts, but their generalization needs to be carefully considered in the context of specific situations:

1. Applicable groups:The results of the study are applicable to educational institutions similar to Chinese higher education institutions (especially those with a focus on nursing and medical-related programs). If other institutions have similar curricula, student body composition (e.g., higher proportion of females, higher concentration of majors), and health promotion models, the study's findings on the role of “family/peer relateds,” “knowledge,” and “attitudes” on smoking behavior could be partially generalized. The mechanisms of “family/peer related”, “knowledge level” and “attitude” on smoking behavior found in the study can be partially replicated.

2. Young student population: the findings have strong explanatory power for the smoking behavior of college students aged 18-23 years, and are particularly applicable to campus environments in economically underdeveloped areas or those with moderate enforcement of tobacco control policies.

Recommendation for Further Research

Expand the Sample Scope

1. Multi-university study: To improve the generalizability of the findings, future studies should expand the sample, even to other universities in the region. This would help account for potential sampling biases in the current study and provide a more complete picture of smoking behaviors among college students in different educational settings.

2. Cover a more diverse student population: Ensure that the sample includes a more balanced gender ratio and includes students from a wider range of majors, including both general and engineering disciplines. This would allow for a more in-depth analysis of the effects of gender and major on smoking behaviors.

Use More Objective Data Collection Methods

1. Ncorporate Biomarkers: To overcome the limitations of self - reported data, future studies should incorporate biomarkers, such as cotinine tests, to more accurately measure smoking prevalence. This will provide a more reliable assessment of students' smoking behavior and reduce the potential for underestimation due to social desirability bias.

2. Longitudinal Studies: Conduct longitudinal studies to track changes in students' smoking behavior, knowledge, and attitudes over time. This will help to identify the long - term effects of tobacco control interventions and the factors that related the development or cessation of smoking behavior.

Explore Additional related Factors

1. Mental Health and Stress: Investigate the relationship between mental health, stress, and smoking behavior among college students. Given that contemporary students generally face similar stressors, it is important to understand how mental health issues may contribute to smoking as a coping mechanism. For example, examine the prevalence of smoking among students with different levels of anxiety, depression, or academic stress.

2. Cultural and Regional Factors: Consider the impact of cultural and regional factors on college students' smoking behavior. Different regions may have unique social norms, tobacco control policies, and cultural attitudes towards smoking. Future research can explore how these factors interact with individual - level factors to related smoking behavior.

REFERENCE

Alasqah, I., Mahmud, I., East, L., & Usher, K. (2019). A systematic review of the prevalence and risk factors of smoking among Saudi adolescents. *Saudi Medical* Journal, 40(9), 867–878. Retrieved from https://doi.org/10.15537/smj.2019.9.24477

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.* Longman.

Bi, C. (2020). *A study on the impact of campus tobacco control policy on secondary school students' smoking behavior* [Doctoral dissertation, Shanghai Jiao Tong University]. Retrieved from https://doi.org/10.27307/d.cnki.gsjtu.2020.003876.

Blake, K. D., Klein, A. L., Walpert, L., et al. (2020). Smoke-free and tobacco-free colleges and universities in the United States. *Tobacco Control*, *29*, 289–294.

Brown, L., & Clark, M. (2020). Challenges in smoking cessation. *Public Health Review*, *58*(2), 234–250.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. David McKay Company.

Cai, L. J., He, L. J., Wang, J. Y., et al. (2021). Analysis of smoking behavior and influencing factors among 782 college students. *Journal of Xinjiang Medical University*, *44*(4), 500–504. Retrieved from https://doi.org/10.3639/j.issn.1009-5551.2021.04.018.

Chen, J. (2023, May 31). Smoking is harmful and quitting should be done before it's too late. People's Political Consultative Conference Newspaper, p. 005. Retrieved from DOI: 10.28660/n.cnki.nrmzx.2023.003332

Cochran, W. G. (1953). Sampling Techniques (1st ed.). John Wiley & Sons.

Chen, J. Y., Zhang, Y. X., Xu, X. X. M., et al. (2022). A survey on the current status of tobacco prevalence among college students in Nanjing, China from 2020 to 2021. *Journal of Southeast University (Medical Edition), 41*(6), 786–792.

Chen, S. X., & Huang, X. (2023). *Analysis of tobacco exposure and its influencing factors among adolescents in Haikou City*. In China Association for Tobacco Control (Ed.), Compilation of abstracts from the 24th National Symposium on Tobacco Control and Health (pp. 1). Haikou City Health and Wellness Service Center; Hunan Normal University School of Medicine. Retrieved from https://doi.org/10.26914/c.cnkihy.2023.119071

Chen, S.-J., Guo, Y., Li, S.-F., et al. (2023). Research progress on the effects of electronic cigarettes on respiratory health. *China Health Education, 39*(2), 152–156. Retrieved from https://doi.org/10.16168/j.cnki.issn.1002-9982.2023.02.011

Chen, X. (2021). Trends in smoking among young people. *Journal of Adolescent Health, 62*(5), 190–205.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Erlbaum.

Deng, G. (2023). *A study on the current situation of smoking among college students in Fujian Province and the factors influencing it*. In Chinese Association for Tobacco Control (Ed.), Compilation of Abstracts of the 24th National Symposium on Tobacco Control and Health (pp. 1). School of Management, Jiageng College, Xiamen University. Retrieved from DOI: 10.26914/c.cnkihy.2023.119022

Friedman, A. S., & Wu, R. J. (2020). Do local tobacco-21 laws reduce smoking among 18 to 20 year-olds? *Nicotine & Tobacco Research, 22*(7), 1195–1201. Retrieved from https://doi.org/10.1093/ntr/ntz123.

Gades, M. S., Alcheva, A., Riegelman, A. L., & Hatsukami, D. K. (2022). The role of nicotine and flavor in the abuse potential and appeal of electronic cigarettes for adult current and former cigarette and electronic cigarette users: A systematic review. *Nicotine & Tobacco Research, 24*(9), 1332–1343. Retrieved from https://doi.org/10.1093/ntr/ntac073

Gao, F., Wen, X. M., Meng, F. P., et al. (2020). Survey and Countermeasure Research on Smoking Status and Attitude of College Students. *Journal of Beihua Institute of Aerospace Industry, 30*(01), 54–56.

Gentzke, A. S. (2022). Tobacco product use and associated factors among middle and high school students—National Youth Tobacco Survey, United States, 2021. MMWR. Surveillance Summaries, 71.

Gong, G. C., & Gong, Z. Q. (2024). Survey on the status quo and psychological causes of e-cigarette use among secondary school students in Loudi City. *Journal of Hunan Institute of Humanities and Science, 41*(1), 110–115.

Guan, F., Su, J., Tao, R., et al. (2024). Analysis of tobacco hazard awareness level and influencing factors among residents aged ≥18 years in Jiangsu Province. *Jiangsu Preventive Medicine, 35*(1), 33–36. Retrieved from https://doi.org/10.13668/j.issn.1006-9070.2024.01.008

Hossain, S., Hossain, S., Ahmed, F., Islam, R., Sikder, T., & Rahman, A. (2019, January 6). Prevalence of tobacco smoking and factors associated with the initiation of smoking among university students in Dhaka, Bangladesh. *Central Asian Journal of Global Health, 6(*1), 244.

Hu, Y. Y. (2022). A survey on smoking and knowledge of tobacco hazards among medical students in local colleges and universities in Gansu Province. *Gansu Science and Technology, 38*(10), 50–53.

Jha, P. (2020). The hazards of smoking and the benefits of cessation: A critical summation of the epidemiological evidence in high-income countries. eLife, 9, e49979. Retrieved from https://doi.org/10.7554/eLife.49979

Jiang, F., & Tian, K. (2022). Current status and influencing factors of smoking among Chinese adults: Based on data from the 2020 China Household Tracking Survey. *JiangsuPreventiveMedicine,33*(6), 742–743. Retrieved from https://doi.org/10.13668/j.issn.1006-9070.2022.06.039

Jiang, X., Chen, H., & Zeng, H. (2015). Influence of family factors on smoking and drinking behaviors of secondary school students in the Pearl River Delta region. *China School Health, 36*(04), 508–511. Retrieved from https://doi.org/10.16835/j.cnki.1000-9817.2015.04.012.

Jin, X. Z., Zhang, Y., Feng, W. T., et al. (2022*). A study on the effect of tobacco control public communication campaigns: Taking the release of China's Smoking Hazards to Health Report 2020 as an example*. In China Association for Tobacco Control (Ed.), Compilation of Abstracts of the 11th Cross-Strait and Hong Kong-Macao Regional Symposium on Tobacco Prevention and Control and the 23rd National Symposium on Tobacco Control and Health (pp. 1). China Health Education Center; School of Public Administration, Renmin University of China. Retrieved from https://doi.org/10.26914/c.cnkihy.2022.043785

Kaiser, T. (2021). A survey on the smoking status of college students in a university in Xinjiang and the study of influencing factors. *Shanxi Youth, (*08), 87–88.

Kim, K.-A. (2016, August 31). A study on the factors related to smoking and smoking conditions among college students in some area. *Journal of the Korea Academia-Industrial Cooperation Society.* Retrieved from https://doi.org/10.5762/kais.2016.17.8.465

Klebe, S., Leigh, J., Henderson, D. W., & Nurminen, M. (2020). Asbestos, smoking and lung cancer: An update. International *Journal of Environmental Research and Public Health*, *17*(1), 258. Retrieved from https://doi.org/10.3390/ijerph17010258

Li, F. L., Ren, R. Z., Zhu, Y. L., et al. (2017). Survey and analysis of college students' smoking status and views on tobacco industry. China Public Safety (Academic Edition), (2), 1–4.

Li, J. (2023*). Effects of self-control on smoking behavior: The mediating role of emotion and time preference* [Doctoral dissertation, Chengdu University of TraditionalChineseMedicine]. Retrieved from https://doi.org/10.26988/d.cnki.gcdzu.2023.000327

Liang, Y. (2022, June 2). Take action, say no to secondhand smoke. Guangxi Daily, p. 010. Retrieved from https://doi.org/10.28292/n.cnki.ngxrb.2022.003315.

Lin, Z., Chen, M. L., & Chen, J. H. (2022). 2019 Survey analysis of Fujian Province on adolescent smoking behavior. In China Association for Tobacco Control (Ed.), Compilation of abstracts from the 11th Cross-Strait and Hong Kong-Macao Symposium on Tobacco Prevention and Control and the 23rd National Symposium on Tobacco Control and Health (pp. 52-53). Fujian Center for Disease Control and Prevention. Retrieved from https://doi.org/10.26914/c.cnkihy.2022.043794.

Liu, G. X. (2023). E-cigarettes are a hazard that should not be underestimated. *Disaster Prevention Expo*, (4), 60–63.

Liu, Y. (2024). Cognitive behavioral therapy intervention for smoking addicts: A meta-analytic and empirical study [Doctoral dissertation, Southwest University]. Retrieved from https://doi.org/10.27684/d.cnki.gxndx.2024.002123

Luan, L. M. (2024*). A casework intervention study of smoking behavior modification among vocational school students* [Doctoral dissertation, Changchun University of Technology]. Retrieved from https://doi.org/10.27805/d.cnki.gccgy.2024.000375

Lu, Y. H., Huang, Y. X., Mei, X., et al. (2021). A survey on the perception of tobacco hazards and attitudes towards smoking ban in public places among college students in Wuhan. *China Chronic Disease Prevention and Control, 29*(12), 906–909, 913. Retrieved from https://doi.org/10.16386/j.cjpccd.issn.1004-6194.2021.12.006

Lu, Y. H., Li, H. Y., Zhou, C., Pan, T., Zhao, T., Huang, Y. X., & Zhang, L. (2024). Tobacco use prevalence and influencing factors among students in an art college in Wuhan. *Chinese Journal of Social Medicine, 41*(6), 718–722.

Ma, W. X., Feng, Y., Li, L., et al. (2023). Logistic regression analysis of smoking status and influencing factors among college students in Suzhou City in 2021. *Chinese Journal of Preventive Medicine, 24*(2), 143–149. Retrieved from https://doi.org/10.16506/j.1009-6639.2023.02.010

Nasser, A. M. A., Geng, Y., & Al-Wesabi, S. A. (2020). The prevalence of smoking (cigarette and waterpipe) among university students in some Arab countries: A systematic review. *Asian Pacific Journal of Cancer Prevention, 21*(3), 583–591. Retrieved from https://doi.org/10.31557/APJCP.2020.21.3.583. PMID: 32212782; PMCID: PMC7437327

Ninth World Health Organization report on the global tobacco epidemic released. (2023). *China Health Policy Research, 16*(9), 21.

Peng, L.-F., & Yi, F. (2021). Effects of electronic cigarettes on the oral health of youth. *Journal of Hunan Normal University (Medical Edition), 18*(6), 168–170.

Qi, B. N., Xu, S. Z., Wang, J. X., et al. (2019). A survey on the current status of smoking awareness among college students of a traditional Chinese medicine college in Xianyang City, Shaanxi Province. *China Health Education, 35(*5), 453–454, 459. Retrieved from https://doi.org/10.16168/j.cnki.issn.1002-9982.2019.05.016

Qin, M. H., Zhang, Q. L., & Yang, R. (2024). Survey and analysis of smoking among students in higher vocational colleges and universities in Southwest Lu. China *Primary Health Care, 38*(6), 77–79, 83.

Qin, S. L., Luo, Y., Luo, X., et al. (2021). Analysis of the prevalence of tobacco use and behavioral influencing factors among vocational high school students in Hubei Province. *China Health Education, 37*(11), 984–986, 991. Retrieved from https://doi.org/10.16168/j.cnki.issn.1002-9982.2021.11.005.

Rigotti, N. A., Kruse, G. R., Livingstone-Banks, J., & Hartmann-Boyce, J. (2022). Treatment of tobacco smoking: A review. *JAMA, 327(*6), 566–577. Retrieved from https://doi.org/10.1001/jama.2022.0395.

Shi, J. (2024). Push to reduce e-cigarette use. Beijing Observatory, (5), 57.

Smith, J., & Doe, A. (2019). Smoking as a Major Risk Factor for Lung Cancer. *Journal of Health Studies, 45*(3), 123–135.

Sun, Y., Wang, W. C., Lang, Y., et al. (2024). A study on the current status of smoking and influencing factors of college students in Ningxia Hui Autonomous Region in 2021.*ChinaHealth Education, 40*(4), 297–304. Retrieved from https://doi.org/10.16168/j.cnki.issn.1002-9982.2024.04.002

Wang, Chen, XIAO Dan, CHI Hui. Summary of the China Smoking Hazardous Health Report 2020[J]. *Chinese Journal of Circulation,2021,36*(10):937-952.

Wang, J. (2021). Exploration of tobacco control health education methods.Health Education, (13), 42.

Wang, J. Y., He, L. J., Ma, Y. J., et al. (2021). Comparison of smoking-related beliefs among college students of different majors in Xinjiang universities based on factor analysis. *Modern Medicine*, *49*(05), 505–510.

Williams, R. (2021). College students and smoking: Social influences. *Educational Health, 22*(3), 312–329.

Wu, A.-R. (2023). *Research on comprehensive interactive tobacco control communication model on campus based on social ecology theory* [Doctoral dissertation, Shenzhen University]. Retrieved from https://doi.org/10.27321/d.cnki.gszdu.2023.003434.

Wu, M. (2023). *Research on parallel group practice of gender equality education for adolescents* [Master's thesis or Doctoral dissertation, Huazhong Agricultural University]. Retrieved from https://doi.org/10.27158/d.cnki.ghznu.2023.000672.

World Health Organization. (2019, December 19). WHO releases new report on global tobacco use trends. Retrieved January 27, 2023, Retrieved from https://www.who.int/zh/news/item/19-12-2019-who-launches-new-report-on-global-tobacco-use-trends

World Health Organization. (2021). WHO report on the global tobacco epidemic 2021: Responding to new and emerging products. World Health Organization.

Yao, Z. J., Li, B. Y., Li, X. Q., et al. (2023). Analysis of the current situation of tobacco epidemic and factors influencing college students' smoking behaviors in Zhaoqing colleges and universities. *South China Preventive Medicine*, *49*(9), 1088–1092.

Yin, T. F., Xu, L., Wan, L., et al. (2023). Survey and analysis of college students' smoking behavior and the current situation of tobacco control in colleges and universities. *Science and Education Guide (Electronic Edition)*, (8), 235–237.

Zeng, Z. (2018). *Research on students' health risk behaviors and their correlation with family factors in higher vocational colleges in western Hunan* [Doctoral dissertation, Jishou University].

Zeng, Z. Q., Wang, S. L., Lou, B., et al. (2019). Evaluation of the construction effect of "smoke-free campus" in Chengdu Medical College. *China Health Care Management, 34*(11), 870–874.

Zhao, L., Xie, X., & Meng, Z. (2023). Investigation and analysis of smoking behavior, cognition and attitude of students in a vocational college in Shaanxi Province. *Medical Information, 36*(8), 51–54.

Zhang, H. H. (2023). Harmful effects of e-cigarettes. Family Medicine, (9), 38.

Zhang, P. (2017). Survey on the current situation and harm of smoking among college students. *Education Modernization, 4*(46), 276–277. Retrieved from https://doi.org/10.16541/j.cnki.2095-8420.2017.46.125

Zhang, S. W. (2019). Research on the current situation of smoking and tobacco control knowledge, belief and behavior of college students in Shenyang city [Doctoral dissertation/Master's thesis], Shenyang Medical College.

Zhao, M. X., Huang, Z. K., Zhang, J., et al. (2022). Main types, effects and reduction measures of endogenous harmful components in tobacco. *New Agriculture*, (6), 17–19.

Zheng, W. W., Xia, S., Han, X., et al. (2019). Analysis of smoking status and influencing factors among vocational school students in Yangpu District, Shanghai. *China School Physician, 33*(01), 15–17.

Zhong, Q., Xiong, Y. H., Mei, X., et al. (2024). A survey on e-cigarette use among high school students in Wuhan. *Preventive Medicine, 36*(4), 355–358. Retrieved from https://doi.org/10.19485/j.cnki.issn2096-5087.2024.04.018

APPENDIX

Appendix A

Interview forms

Research Title

Factors influencing smoking among students at hainan vocational university of science and technology in Yunlong campus

Consent day Date.....Month.....Year.....

I am Mr. / Mrs. / Miss. . . . . .

address.....

Read the details from the information sheet for participants in the research project and I agree to voluntarily participate in the research project.

I have received a copy of the consent form that I signed and dated, along with an information sheet for research participants. This is before signing the consent form to conduct this research. I was explained by the researcher about the purpose of the research. The duration of the research, research methods, dangers or symptoms that may arise from the research. or from the medicine used Including the benefits that will arise from the research and guidelines for treatment by other methods in detail I have had enough time and opportunity to ask questions until I have a good understanding. The researcher answered various questions willingly and without concealment until I was satisfied.

I have the right to terminate my participation in the research project at any time. There is no need to inform the reason. and termination of participation in this research It will not affect treatment or other rights that I will continue to receive. The

researcher guarantees that my personal information will be kept secret. and will be disclosed only with my consent. Other persons on behalf of the research sponsoring company Human Research Ethics Committee the Food and Drug Administration may be permitted to inspect and process my information. This must be done for the purpose of verifying the accuracy of the information only. By agreeing to participate in this study, I am giving consent to have my medical history reviewed.

I have read the above and have a complete understanding of it. Willing to participate in research willingly. Therefore, signed this consent document.

.....Sign the person giving consent.

(.....) Name of person giving consent

Date .....Month.....Year.....

I have explained the purpose of the research, the research methods, dangers or adverse reactions or risks that may arise from the research. or from the medicine used Including the benefits that will arise from thorough research. Let the participants in the research project named above know and have a good understanding. Ready to sign the consent document willingly

.....

Signed by the researcher

(.....)

Name of researcher in detail

Date .....Month……..Year…….

.....	.....
Witness signature	Witness signature
(.....)	(.....)
Name of witness in detail	Name of witness in detail
Date .....Month…..Year…….	Date .....Month……..Year…….

Appendix B

Questionnaire

Questionnaire on Factors Affecting Students' Smoking an hainan vocational university of science and technology in yunlong campus

Dear Students

In order to gain a deeper understanding of the current situation of students' smoking behavior and its influencing factors, so as to provide a reference for our school to develop more effective health education policies and interventions, we hereby conduct this anonymous survey. In order to gain a deeper understanding of the current situation of students' smoking behavior and its influencing factors, so as to provide a reference for our school to develop more effective health education policies and interventions, we hereby conduct this anonymous survey. will only be used for statistical analysis and to ensure the absolute confidentiality of your personal information. Please fill in the following Your answers will only be used for statistical analysis and to ensure the absolute confidentiality of your personal information.

(Please check the boxes or fill in the blanks that apply to your situation)

Part I. Personal information

1. Your gender.

☐ male

☐ Femal

2. Your Age

☐ 18-20 years

☐ 21-23 years

☐ ≥24 years

3.Your grade level

☐ first-year university student

☐ second-year university student

☐ third-year university student

☐ fourth-year university student

4.Your course of study

☐ music profession

☐ nurse

☐ accounting

☐ urban construction

☐ medicine

5. What is your monthly allowance?

☐ ≤500

☐ 500 - $1,000

☐ 1001-1500

☐ 1501~2000

☐ ≥2000

6. Smoking by family members and people around

1. NO
2. Father
3. Mother
4. siblings
5. Relatives
6. Friends
7. Other (please specify) _____

7. Receiving knowledge about smoking

1. No
2. Health officials
3. Teachers
4. Various media

Part II, Knowledge about smoking

8. Do you know which disease smoking increases the risk of the most?

□ Diabetes

□ High blood pressure

□ Lung cancer

□ Kidney disease

9. Which substance in cigarettes causes addiction?

□ Nicotine

□Tar

□ Carbon monoxide

□ Nitrogen dioxide

10. How does smoking affect heart health?

□ Lowers blood pressure

□ ncreases risk of cardiovascular disease

□ Improves blood circulation

□ Has no effect on the heart

11.Which type of cancer does smoking most increase the risk of?

□ Bladder cancer

□ Lung cancer

□ Thyroid cancer

□ Brain cancer

12. Which body system does smoking damage the most?

☐ Nervous system

☐ Digestive system

☐ Respiratory system

☐ Reproductive system

13. How does tar in cigarettes affect the body?

□ Causes yellowing of teeth

□ Damages the nervous system

□ Helps reduce stress

□ Strengthens muscles

14. Do you know how smoking affects the skin?

□ Makes skin oily

□ Causes dullness and wrinkles

□ Makes skin fairer

□ Has no effect on skin

15. How does smoking affect the lungs?

□ Increases lung capacity

□ Reduces air exchange efficiency

□ Strengthens the lungs

□ Has no effect on the lungs

16. What is the long-term health impact of smoking?

□ No long-term effect

□ Increases risk of chronic diseases

□ Improves overall health

□ Helps extend lifespan

17. Do you know if children and the elderly exposed to smokers are at health risk?

□ High risk

□ No health impact

□ Improves health

□ Mild health risk

Part III: Attitudes toward smoking

18. Please select carefully the answer for each question and choose the answer by marking (√) the response option that best represents.(□ Strongly disagree □ Disagree □Agree □Strongly agree)

1. Cigarettes are not addictive, harmful to health or image.
2. Smoking helps relieve stress
3. People who don't smoke are considered outdated or old-fashioned in today's society.
4. Non-smokers have stronger body odor and more severe bad breath than smokers.
5. People who smoke can socialize more easily and have more friends.
6. Smoking helps increase focus and mindfulness.
7. Smoking in moderation is not harmful to health.
8. Smoking does not increase the risk of trying other types of drugs.
9. If students are among a group of smokers, they will not be forced to smoke.
10. Smoking is a normal behavior for both men and women.

Part IV: Smoking Behavior

19. Do you smoke or have you ever tried smoking?

□ I have never smoked even one or two cigarettes.

□ Never smoked (Do not answer the following question)

□ Tried smoking but currently do not smoke

□ Currently smoking

20. What was your age when you first started smoking?

☐10 - 14 years

☐15 - 19 years

☐20 – 24 years

21. Causes or motivations for smoking

☐ Stress/Anxiety

☐ Peer influence/Imitating friends

☐ To show maturity

☐ Curiosity

☐ For socializing

☐ To build confidence

22. Cigarette brands smoked

☐ Zhonghua

☐ Hongtashan

☐ Yunyan

☐ Jiaozi

☐ Furongwang

☐ Honghe

☐ Others

23. Average number of cigarettes smoked per day

☐ 1 - 3 cigarettes

☐ 4 - 6 cigarettes

☐ 7 - 9 cigarettes

24. Smoking frequency

☐ Every day

☐Every 2-3 days

☐ Occasionally

25. Times when smoking

☐ After meals

☐ In the restroom

☐ After waking up

☐ While drinking alcohol

☐ Others

26. Places for smoking

☐ College

☐ Dormitory

☐ Park

☐ Smoking area

☐ Others

27. Feelings when smoking

1. Relaxed

2. Happy

3. Refreshed

4. Relieved from anxiety

28. Symptoms when not smoking

☐ Irritable

☐ Stressed

☐ Restless

☐ Others

29. Sources for purchasing cigarettes

☐ Convenience store

☐ Grocery store

☐Street vendor

30. Average daily expense on cigarettes

☐ 10 Yuan

☐ 20 Yuan

☐ More than 20 yuan

31. Desire to quit smoking:

☐ Want to quit

☐ Do not want to quit

Thank you for your patience in completing this questionnaire! Your feedback is very important to my research and will directly help us optimize our health education strategies to create healthier learning and living environments for our students.

BIOGRAPHY

Name - Surname Ms.Yu Jing

Date of birth 2 May 2000

Current address

House number:No. 89 Subdistrict Bandu District Mueang

Province Chiang Rai

Educational record

Date: September 2019 - June 2023 (Undergraduate)

Graduated from: Hainan Vocational University of Science and Technology.

Date September 2016 - June 2019 (High School)

Graduated from: Chishui No. 8 Middle School, Guizhou Province, China

Date: September 2013 - June 2016 (junior high school)

Graduated from: Chishui No. 8 Middle School, Guizhou Province, China

Date: September 2007 - June 2013 (primary school)

Graduated from: Guandu Primary School, Chishui City, Guizhou Province

Work experience

Date: July 2023-January 2024, Workplace: Hainan Vocational University of Science and Technology

Address: No. 118, Yunding Road, Yunlong Town, Qiongshan District, Haikou City, Hainan Province